ACCREDITATION

Stanford University is accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges. In addition, certain programs of the University have specialized accreditation. For information, contact the Office of the Registrar.

STATEMENT OF NONDISCRIMINATORY POLICY

Stanford University admits students of either sex and any race, color, religion, sexual orientation, or national and ethnic origin to all the rights, privileges, programs, and activities generally accorded or made available to students at the University. It does not discriminate against students on the basis of sex, race, age, color, disability, religion, sexual orientation, or national and ethnic origin in the administration of its educational policies, admissions policies, scholarships and loan programs, and athletic and other University-administered programs.

ADDITIONAL INFORMATION

Additional information on Stanford University can be obtained through Stanford's website at www.stanford.edu.

Every effort is made to ensure that the course information, applicable policies, and other materials contained in this bulletin are accurate and current at the time the bulletin goes to press. The University reserves the right to make changes at any time without prior notice. The bulletin is also available on the University's web site at: www.stanford.edu/dept/registrar/bulletin/; check the online version for the currently applicable policies and information.
# ACADEMIC CALENDAR 2000-01

## AUTUMN QUARTER

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 (Mon)</td>
<td></td>
<td>First day of quarter</td>
</tr>
<tr>
<td>26 (Tue)</td>
<td></td>
<td>Last day to arrange payment of University fees</td>
</tr>
<tr>
<td>27 (Wed)</td>
<td></td>
<td>Instruction begins</td>
</tr>
<tr>
<td>28 (Thu)</td>
<td></td>
<td>Conferral of degrees—Summer Quarter</td>
</tr>
<tr>
<td>8 (Sun)</td>
<td>(Sun)</td>
<td>Last day for filing Study List</td>
</tr>
<tr>
<td>22 (Sun)</td>
<td>(Sun)</td>
<td>Last day for adding courses or units</td>
</tr>
<tr>
<td>29 (Sun)</td>
<td>(Sun)</td>
<td>Last day for dropping courses or units</td>
</tr>
<tr>
<td>12 (Sun)</td>
<td>(Sun)</td>
<td>Last day for declaring or dropping CR/no credit grading option</td>
</tr>
<tr>
<td>23-26 (Thu-Sun)</td>
<td>(Thu-Sun)</td>
<td>Thanksgiving recess (no classes)</td>
</tr>
<tr>
<td>26 (Sun)</td>
<td>(Sun)</td>
<td>Last day for withdrawing from courses; last day for filing A.B., B.S., and B.A.S. application for January (Autumn Quarter) conferral</td>
</tr>
<tr>
<td>3-9 (Sun-Sat)</td>
<td>(Sun-Sat)</td>
<td>At last class, last opportunity to arrange Incomplete in a course</td>
</tr>
<tr>
<td>4-10 (Mon-Sun)</td>
<td>(Mon-Sun)</td>
<td>End-Quarter Period</td>
</tr>
<tr>
<td>8 (Fri)</td>
<td></td>
<td>Last day of classes (unless class meets on Saturday); last day for filing candidacy applications for Educational Specialist or Engineer degree for April (Winter Quarter) conferral; last day for filing University thesis, D.M.A. final project, Ph.D. dissertation, and Graduation Application for January (Autumn Quarter) conferral of graduate degree</td>
</tr>
<tr>
<td>11-15 (Mon-Fri)</td>
<td>(Mon-Fri)</td>
<td>End-Quarter examinations</td>
</tr>
</tbody>
</table>

## WINTER QUARTER

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 (Mon)</td>
<td></td>
<td>Last day to arrange payment of University fees</td>
</tr>
<tr>
<td>9 (Tue)</td>
<td></td>
<td>Instruction begins</td>
</tr>
<tr>
<td>11 (Thu)</td>
<td></td>
<td>Conferral of degrees—Autumn Quarter</td>
</tr>
<tr>
<td>15 (Mon)</td>
<td></td>
<td>Observance of Martin Luther King Day (holiday, no classes); last day for filing Study List</td>
</tr>
<tr>
<td>4 (Sun)</td>
<td></td>
<td>Last day for adding courses or units</td>
</tr>
<tr>
<td>11 (Sun)</td>
<td></td>
<td>Last day for dropping courses or units</td>
</tr>
<tr>
<td>19 (Mon)</td>
<td></td>
<td>Observance of Presidents’ Day (holiday, no classes); last day for declaring or dropping CR/no credit grading option; last day for filing A.B., B.S., and B.A.S. application for April (Winter Quarter) and June (Spring Quarter) conferral; last day for filing graduate Graduation Application for June commencement</td>
</tr>
<tr>
<td>11 (Sun)</td>
<td></td>
<td>Last day to withdraw from courses</td>
</tr>
<tr>
<td>11-17 (Sun-Sat)</td>
<td>(Sun-Sat)</td>
<td>At last class, last opportunity to arrange Incomplete in a course</td>
</tr>
<tr>
<td>12-18 (Mon-Sun)</td>
<td>(Mon-Sun)</td>
<td>End-Quarter Period</td>
</tr>
<tr>
<td>16 (Fri)</td>
<td></td>
<td>Last day of classes (unless class meets Saturday); last day for filing candidacy applications for Educational Specialist or Engineer degree for June (Spring Quarter) conferral; last day for filing University thesis, D.M.A. final project, Ph.D. dissertation, and Graduation Application for April (Winter Quarter) conferral of graduate degree</td>
</tr>
<tr>
<td>19-23 (Mon-Fri)</td>
<td>(Mon-Fri)</td>
<td>End-Quarter examinations</td>
</tr>
</tbody>
</table>

## SPRING QUARTER

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 (Mon)</td>
<td></td>
<td>Filing date for matriculated undergraduate financial aid applications</td>
</tr>
<tr>
<td>2 (Mon)</td>
<td></td>
<td>Last day to arrange payment of University fees</td>
</tr>
<tr>
<td>3 (Tue)</td>
<td></td>
<td>Instruction begins; last day for full refund for leave of absence</td>
</tr>
<tr>
<td>5 (Thu)</td>
<td></td>
<td>Conferral of degrees—Winter Quarter</td>
</tr>
<tr>
<td>15 (Sun)</td>
<td></td>
<td>Last day for filing Study List</td>
</tr>
<tr>
<td>29 (Sun)</td>
<td></td>
<td>Last day for adding courses or units</td>
</tr>
<tr>
<td>20 (Sun)</td>
<td></td>
<td>Last day for declaring or dropping CR/no credit grading option</td>
</tr>
<tr>
<td>22 (Mon)</td>
<td></td>
<td>Observance of Memorial Day (holiday, no classes)</td>
</tr>
<tr>
<td>1-7 (Fri-Thu)</td>
<td>(Fri-Thu)</td>
<td>End-Quarter Period</td>
</tr>
<tr>
<td>3 (Sun)</td>
<td></td>
<td>Last day to withdraw from courses</td>
</tr>
<tr>
<td>3-6 (Sun-Wed)</td>
<td>(Sun-Wed)</td>
<td>At last class, last opportunity to arrange Incomplete in a course</td>
</tr>
<tr>
<td>6 (Wed)</td>
<td></td>
<td>Last day for filing candidacy applications for Educational Specialist or Engineer degree for September (Summer Quarter) conferral; last day for filing University thesis, D.M.A. final project, Ph.D. dissertation, and Graduation Application for June (Spring Quarter) conferral of graduate degree</td>
</tr>
<tr>
<td>7 (Thu)</td>
<td></td>
<td>Day before finals, no classes</td>
</tr>
<tr>
<td>8-13 (Fri-Wed)</td>
<td>(Fri-Wed)</td>
<td>End-Quarter examinations</td>
</tr>
<tr>
<td>16 (Sat)</td>
<td></td>
<td>Baccalaureate Saturday and Senior Class Day</td>
</tr>
<tr>
<td>17 (Sun)</td>
<td></td>
<td>Commencement</td>
</tr>
</tbody>
</table>

## SUMMER QUARTER

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 (Mon)</td>
<td></td>
<td>Last day to arrange payment of University fees</td>
</tr>
<tr>
<td>26 (Tue)</td>
<td></td>
<td>Instruction begins</td>
</tr>
<tr>
<td>1 (Sun)</td>
<td></td>
<td>Last day for filing Study List</td>
</tr>
<tr>
<td>4 (Wed)</td>
<td></td>
<td>Independence Day (holiday observance, no classes)</td>
</tr>
<tr>
<td>8 (Mon)</td>
<td></td>
<td>Last day for adding courses or units</td>
</tr>
<tr>
<td>15 (Sun)</td>
<td></td>
<td>Last day for dropping courses or units</td>
</tr>
<tr>
<td>29 (Sun)</td>
<td></td>
<td>Last day for declaring or dropping CR/no credit grading option</td>
</tr>
<tr>
<td>10-16 (Fri-Thu)</td>
<td>(Fri-Thu)</td>
<td>At last class, last opportunity to arrange Incomplete in a course</td>
</tr>
<tr>
<td>11 (Sat)</td>
<td></td>
<td>Last day for withdrawing from courses</td>
</tr>
<tr>
<td>11-16 (Sat-Thu)</td>
<td>(Sat-Thu)</td>
<td>End-Quarter Period</td>
</tr>
<tr>
<td>17-18 (Fri-Sat)</td>
<td>(Fri-Sat)</td>
<td>Eight-week term examinations</td>
</tr>
<tr>
<td>27 (Mon)</td>
<td></td>
<td>Last day for filing candidacy applications for Educational Specialist or Engineer degree for January (Autumn Quarter) conferral; last day for filing University thesis, D.M.A. final project, Ph.D. dissertation, and Graduation Application for October (Summer Quarter) conferral of graduate degree</td>
</tr>
</tbody>
</table>

## Sept 4 (Tue) |  | Quarter closes |
## Contents

### WELCOME TO STANFORD .................................................. 6
### UNIVERSITY GOVERNANCE AND ORGANIZATION ......................... 8
  - Directory ........................................................................... 8
  - Organization ...................................................................... 8
### ADMISSION AND FINANCIAL AID ........................................... 11
  - Admission ......................................................................... 11
  - Financial Aid ..................................................................... 13
### TUITION, FEES, AND HOUSING ............................................ 15
  - Assessments ....................................................................... 15
  - Payments ........................................................................... 17
  - Refunds ............................................................................ 17
  - Housing ............................................................................. 18
### UNDERGRADUATE DEGREES ................................................. 20
  - Degree Programs .............................................................. 20
  - Degree Requirements ....................................................... 21
  - Minors, Honors, Academic Standing, and Advising ............... 27
### GRADUATE DEGREES ............................................................ 30
  - General Requirements ....................................................... 30
  - Degree-Specific Requirements ........................................... 34
  - Advising and Credentials .................................................. 37
### ACADEMIC POLICIES AND STATEMENTS ................................. 38
  - Registration and Records ................................................... 38
  - Examinations .................................................................... 40
  - Grading Systems ................................................................ 41
  - Statement on Student Academic Grievance Procedures ......... 43
### COURSES OF INSTRUCTION ................................................ 46
### GRADUATE SCHOOL OF BUSINESS ...................................... 47
### SCHOOL OF EARTH SCIENCES .............................................. 48
  - Earth Systems Program ..................................................... 48
  - Geological and Environmental Sciences ............................. 53
  - Geophysics ....................................................................... 57
  - Petroleum Engineering ...................................................... 72
### SCHOOL OF EDUCATION ...................................................... 79
### SCHOOL OF ENGINEERING .................................................. 96
  - Aeronautics and Astronautics ............................................. 111
  - Chemical Engineering ...................................................... 118
  - Civil and Environmental Engineering ................................. 122
  - Computer Science ............................................................ 135
  - Electrical Engineering ..................................................... 150
  - Management Science and Engineering .............................. 166
  - Materials Science and Engineering ................................... 181
  - Mechanical Engineering ................................................... 188
  - Scientific Computing and Computational Mathematics Program .................................................. 204
### SCHOOL OF HUMANITIES AND SCIENCES ............................ 207
  - African and African American Studies, Program in .......... 207
  - African Studies ................................................................. 212
  - American Studies .............................................................. 214
  - Anthropological Sciences ................................................ 218
  - Applied Physics ............................................................... 230
  - Archaeology Center, Stanford .......................................... 234
  - Art and Art History ........................................................... 235
  - Asian Languages .............................................................. 251
  - Astronomy Course Program ............................................. 260
  - Athletics, Physical Education, and Recreation ................... 261
  - Biological Sciences .......................................................... 266
  - Division of Marine Science, Hopkins Marine Station ......... 277
  - Biophysics Program .......................................................... 279
  - Chemistry ......................................................................... 280
  - Classics ............................................................................ 285
  - Communication ................................................................ 292
  - Comparative Literature .................................................... 301
  - Comparative Studies in Race and Ethnicity (CSRE) ............. 310
  - Cultural and Social Anthropology ..................................... 317
  - Drama ................................................................................ 326
  - East Asian Studies ........................................................... 336
  - Economics ......................................................................... 344

### English ................................. 354
  - Ethics in Society, Program in ............................................ 357
  - Feminist Studies ............................................................... 369
  - Film Studies ................................................................. 374
  - Financial Mathematics .................................................... 374
  - French and Italian ............................................................ 375
  - German Studies .............................................................. 391
  - History .............................................................................. 397
  - History and Philosophy of Science, Program in ................. 422
  - Human Biology, Program in ............................................. 423
  - Interdisciplinary Studies in Humanities ............................ 432
  - International Policy Studies ............................................. 436
  - International Relations .................................................... 439
  - Introduction to the Humanities Program ......................... 446
  - Jewish Studies, Program in .............................................. 447
  - Language Center .............................................................. 450
  - Latin American Studies, Center for ................................ 454
  - Linguistics ................................................................. 461

  - English as a Second Language ......................................... 468
  - Literatures, Cultures, and Languages, Division of ............ 469
  - Mathematical and Computational Science ..................... 470
  - Mathematics .................................................................... 472
  - Medieval Studies ............................................................ 480
  - Modern Thought and Literature ....................................... 482
  - Music ............................................................................... 485
  - Overseas Studies Program .............................................. 495
  - Philosophy ........................................................................ 505
  - Physics ............................................................................ 516
  - Political Science .............................................................. 526
  - Population and Resource Studies, Morrison Institute for .... 540
  - Psychology ................................................................. 543
  - Public Policy Program ..................................................... 553
  - Religious Studies ............................................................ 557
  - Russian and East European Studies, Center for ............... 565
  - Science, Mathematics, Engineering Core ....................... 570
  - Science, Technology, and Society .................................... 570
  - Slavic Languages and Literatures ...................................... 575
  - Sociology .......................................................................... 584
  - Space Science and Astrophysics, Center for ...................... 595
  - Spanish and Portuguese .................................................. 596
  - Statistics ........................................................................... 606
  - Structured Liberal Education, Program in ....................... 612
  - Symbolic Systems, Program in ....................................... 612
  - Urban Studies, Program on ............................................. 616

### ACADEMIC PROGRAMS AND CENTERS ................................ 622
  - Center for Teaching and Learning ................................... 622
  - Chicano Research, Stanford Center for ............................. 622
  - Individually Designed Majors, Program for ...................... 622
  - Social Science History Institute ....................................... 623
  - Stanford Introductory Seminars .................................... 624
  - Undergraduate Research Opportunities (URO) ............... 629
  - Washington, Stanford in ................................................. 630

### SCHOOL OF LAW ................................................................. 631
### SCHOOL OF MEDICINE ........................................................ 633
  - Biochemistry ................................................................. 633
  - Biomedical Ethics, Center for ......................................... 635
  - Biomedical Informatics Program ....................................... 636
  - Cancer Biology Program .................................................. 640
  - Comparative Medicine ..................................................... 641
  - Developmental Biology .................................................... 641
  - Epidemiology Program .................................................... 643
  - Genetics ............................................................................ 644
  - Gynecology and Obstetrics .............................................. 646
  - Health Research and Policy ............................................. 646
  - Health Services Research Program .................................. 648
  - Immunology Program ...................................................... 649
  - Microbiology and Immunology ........................................ 651
  - Molecular and Cellular Biology ....................................... 653
  - Molecular Pharmacology ................................................ 654
  - Neurobiology ................................................................. 656
  - Neurosciences Program ................................................... 656
  - Pathology .......................................................................... 657
  - Radiation Oncology ........................................................ 658
  - Radiology ........................................................................... 659
Welcome to Stanford

On October 1, 1891, nearly 500 enthusiastic young men and women were on hand for opening day ceremonies at Leland Stanford Junior University. They came from all over: many from California, some who followed professors hired from other colleges and universities, and some simply seeking adventure in the West. They came to seize a special opportunity, to be part of the pioneer class in a brand new university. They stayed to help turn an ambitious dream into a thriving reality. As a pioneer faculty member recalled, “Hope was in every heart, and the presiding spirit of freedom prompted us to dare greatly.”

For Leland and Jane Stanford of that day, the University was the realization of a dream and a fitting tribute to the memory of their only son, who had died of typhoid fever weeks before his 16th birthday, at an age when many young men and women were planning their college educations.

From the beginning, it was clear that Stanford would be different. It was coeducational at a time when single-sex colleges were the norm. It was non-sectarian when most private colleges were still affiliated with a church. And it offered a broad, flexible program of study while most schools insisted on a rigid curriculum of classical studies. Though there were many difficulties during the first months (housing was inadequate, microscopes and books were late in arriving from the East) the first year foretold greatness. As Jane Stanford wrote in the summer of 1892, “Even our fondest hopes have been realized.”

What manner of people were this man and this woman who had the intelligence, the means, the faith, and the daring to plan a major university in Pacific soil, far from the nation’s center of culture?

ABOUT LELAND STANFORD

Although he was educated as a lawyer, Leland Stanford, together with Jane, came to California in 1852 to join his five brothers in their mercantile business in the gold fields. They established large-scale operations in Sacramento, where Mr. Stanford became a leading figure in California business and politics. One of the “Big Four” who built the western link of the first transcontinental railroad, he was elected Governor of California and later United States Senator. One of the founders of the Republican Party in California, he was an ardent follower of Abraham Lincoln and is credited with keeping California in the Union during the Civil War.

THE CASE FOR A LIBERAL EDUCATION

Despite the enormous success they achieved in their lives, Governor and Mrs. Stanford had come from families of modest means and had built their way up through a life of hard work. So it was natural that their first thoughts were to establish an institution where young men and women could “grapple successfully with the practicalities of life.” As their thoughts matured, however, these ideas of “practical education” enlarged to the concept of producing cultured and useful citizens who were well-prepared for professional success. In a statement of the case for liberal education that was remarkable for its time, Leland Stanford wrote, “I attach great importance to general literature for the enlargement of the mind and for giving business capacity. I think I have noticed that technically educated boys do not make the most successful businessmen. The imagination needs to be cultivated and developed to assure success in life. A man will never construct anything he cannot conceive.”

STANFORD LANDS AND ARCHITECTURE

The campus occupies what was once Leland Stanford’s Palo Alto farm and the favorite residence of the Stanford family. The Stanfords purchased an existing estate in 1876 and later acquired much of the land in the local watershed for their stock farm, orchards, and vineyards. The name of the farm came from the tree El Palo Alto, a coast redwood (Sequoia sempervirens) that still stands near the northwest corner of the property on the edge of San Francisquito Creek. Many years ago, one of the winter floods that periodically rushed down the arroyo tore off one of its twin trunks, but half of the venerable old tree lives on, a gaunt and time-scarred monument. Named in 1700 by Spanish explorers, El Palo Alto has been the University’s symbol and the centerpiece of its official seal.

The Stanfords gave their farm to the University in the Founding Grant of 1885. They personally financed the entire cost of the construction and operation of the University until 1903, when surviving founder Jane Stanford turned over control to the Board of Trustees. The founding gift was in excess of $21 million, not including the land and buildings.

The general concept for the University grounds and buildings was conceived by Frederick Law Olmsted, the designer of Central Park in New York. A brilliant young Boston architect, Charles Allerton Coolidge, further developed the concept in the style of his late mentor, Henry Hobson Richardson. The style, called Richardsonian Romanesque, is a blend of Romanesque and Mission Revival architecture. It is characterized by rectilinear sandstone buildings joined by covered arcades formed of successive half-circle arches, the latter supported by short columns with decorated capitals.

More than one hundred years later, the University still enjoys the original 8,180 acres (almost 13 square miles) of grassy fields, eucalyptus groves, and rolling hills that were the Stanfords’ generous legacy, as well as the Quadrangle of “long corridors with their stately pillars” at the center of campus. It is still true, as the philosopher William James said, during his stint as a visiting professor, that the climate is “so friendly...that every morning wakes one fresh for new amounts of work.”

CURRENT PERSPECTIVES

In other ways, the University has changed tremendously on its way to recognition as one of the world’s great universities. At the hub of a vital and diverse Bay Area, Stanford is an hour’s drive south of San Francisco and just a few miles north of the Silicon Valley, an area dotted with computer and high technology firms largely spawned by the University’s faculty and graduates. On campus, students and faculty enjoy new libraries, modern laboratories, sports facilities, and comfortable residences. Contemporary sculpture, as well as pieces from the Stanford Museum’s extensive collection of sculpture by Auguste Rodin, is placed throughout the campus, providing unexpected pleasures at many turns.

The Iris and B. Gerald Cantor Center for Visual Arts at Stanford University opened in January 1999. The center includes the historic museum building, the Rodin Sculpture Garden and a new wing with spacious galleries, auditorium, cafe, and bookshop. At the Stanford Medical Center, world-renowned for its research, teaching, and patient care, scientists and physicians are searching for answers to fundamental questions about health and disease. Ninety miles down the coast, at Stanford’s Hopkins Marine Station on the Monterey Bay, scientists are working to better understand the mechanisms of evolution, human development, and ecological systems.

The University is organized into seven schools: Earth Sciences, Education, Engineering, the Graduate School of Business, Humanities and Sciences, Law, and Medicine. In addition, there are more than 30 interdisciplinary centers, programs, and research laboratories (including the Hoover Institution on War, Revolution and Peace; the Institute for International Studies; the Stanford Linear Accelerator Center; and the Stanford Center for the Study of Families, Children, and Youth) where faculty from a wide range of fields bring different perspectives to bear on issues and problems. Stanford’s Overseas Studies Program offers students in all fields remarkable opportunities for study abroad, with campuses in Berlin, Buenos Aires, Florence, Kyoto, Oxford, Paris, Puebla, Rome, and Santiago.

STANFORD PEOPLE

By any measure, Stanford’s faculty, which number approximately 1,595, is one of the most distinguished in the nation. It includes 12 Nobel laureates, 4 Pulitzer Prize winners, 18 National Medal of Science winners, 122 members of the National Academy of Sciences, 210 members of the American Academy of Arts and Sciences, 78 members of the National Academy of Engineering, and 24 members of the National Academy of Education. Yet beyond their array of honors, what truly
distinguishes Stanford faculty is their commitment to sharing knowledge with their students. The great majority of professors teach undergraduates both in introductory lecture classes and in small advanced seminars. Enrollment in Autumn Quarter 1999 totaled 14,219, of whom 6,594 were undergraduates and 7,625 were graduate students. Like the faculty, the Stanford student body is distinguished. Approximately eight students apply to Stanford for every place in the freshman class. Seventy-one Stanford students have been named Rhodes Scholars and 39 have been named Marshall Scholars. In 1998-99, the completion or graduation rate for students who entered Stanford University full-time in 1993 was 91 percent. Stanford awarded 4,596 degrees in 1998-99, of which 1,687 were baccalaureate and 2,909 were advanced degrees.

Stanford students also shine in a tremendous array of activities outside the classroom from student government to music, theater, and journalism. Through the Haas Center for Public Service, students participate in dozens of community service activities, such as tutoring programs for children in nearby East Palo Alto, the Hunger Project, and the Arbor Free Clinic.

In the athletic arena, Stanford students have enjoyed tremendous success as well. Stanford fields teams in 33 Division I varsity sports. Of Stanford’s 78 NCAA team titles, 35 have been captured in the past ten years, placing Stanford at the top among the nation’s most title-winning schools of the ’90s. In 1999-2000, Stanford won two NCAA team titles in men’s tennis and men’s track and field and won the Sears Director’s Cup, emblematic of the top overall athletic program in the country, for the sixth consecutive season. Six teams placed second in the nation last year (baseball, women’s volleyball, men’s water polo, synchronized swimming, women’s tennis, and women’s golf) and Stanford became the first school in Pac-10 history to win conference championships in football, men’s basketball and baseball in the same year. Athletic success has reached beyond The Farm, as well, with 49 Stanford athletes and coaches taking part in the 1996 Olympics in Atlanta. Intramural and club sports are also popular; over 1,000 students take part in the club sports program, while participation in the intramural program has reached 9,000 with many active in more than one sport.

Stanford graduates can be found in an extraordinary variety of places: in space (Sally Ride, ’73, Ph.D. ’78, was the first American woman in space); on the news (Ted Koppel, A.M. ’62, created the successful program Nightline); off-Broadway (David Henry Hwang, ’79, received a Tony Award for his celebrated work, M. Butterfly); at the helm of major corporations (Bill Hewlett and David Packard, both ’34, Enr. ’39, started their multi-billion dollar company, Hewlett-Packard, in a nearby garage; and, more recently, Scott McNealy, ’80, founded Sun Microsystems, and Chih-yuan (Jerry) Yang, ’94, and David Filo, ’90, founded Yahoo); and on the U.S. Supreme Court (four Stanford graduates, Sandra Day O’Connor, ’50, J.D. ’53; Anthony Kennedy, ’58; William Rehnquist, ’48, J.D. ’52; and Stephen Breyer, ’59, currently sit on the high court).

LOOKING AHEAD

In her address to the Board of Trustees, in 1904, Jane Stanford said, “Let us not be afraid to outgrow old thoughts and ways, and dare to think on new lines as to the future of the work under our care.” Her thoughts echo in the words of former Stanford President Gerhard Casper, who has said, “The true University must reinvent itself every day…. At Stanford, these are days of such reconsideration and fresh support for our fundamental tasks: teaching, learning, and research.”
University Governance and Organization

DIRECTORY

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Cory A. Booker, Municipal Council, Newark City Hall, 920 Broad Street, Room 304, Newark, NJ 07102
John E. Bryson, Edison International, 1271 Avenue of the Americas, New York, NY

Henry Muller, Time Inc., 1275 Battery Street, 23rd Floor, San Francisco, CA 94111
T. Robert Burke, Four Embarcadero Center, Suite 3700, San Francisco, CA 94111
Winston H. Chen, Paramitas Foundation, 3945 Freedom Circle, Suite 760, Santa Clara, CA 95054
Mary B. Cranston, Pillsbury Madison & Sutro, 50 Fremont Street, San Francisco, CA 94105
Doris F. Fisher, GAP, Inc., One Harrison Street, San Francisco, CA 94105
Bradford M. Freeman, Freeman Spogli & Company, 11100 Santa Monica Boulevard, Suite 1900, Los Angeles, CA 90025-3384
William A. Halter, Office of Social Security, ITC Building, Room 874, 500 E Street, SW, Washington, DC 20054
Leslie Hatamiya, Board of Trustees Office, Building 310, 2nd Floor, Main Quadrangle, Stanford, CA 94305-2060
John Hennessey, President, Stanford University, Building 10, Main Quadrangle, Stanford, CA 94305-2060
William C. Landreth, Board of Trustees Office, Building 310, 2nd Floor, Main Quadrangle, Stanford, CA 94305-2060
David M. Laney, Jenkens and Gilchrist, 1445 Ross Avenue, Suite 3200, Dallas, TX 75202-2799
John P. Levin, Folger Levin & Kahn LLP, Embarcadero Center West, 275 Battery Street, 23rd Floor, San Francisco, CA 94111
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Mark Oldman, Board of Trustees Office, Building 310, 2nd Floor, Main Quadrangle, Stanford, CA 94305-2060
Susan P. Orr, Board of Trustees Office, Building 310, 2nd Floor, Main Quadrangle, Stanford, CA 94305-2060
Gregor G. Peterson, P.O. Box 4450, 904 Lakeshore Boulevard, Incline Village, NV 89450
Pamela A. Rymer, Court of Appeals, 125 South Grand Avenue, #600, Pasadena, CA 91105
Victoria P. Sant, Board of Trustees Office, Building 310, 2nd Floor, Main Quadrangle, Stanford, CA 94305-2060

John H. Scully, SPO Partners & Co., 591 Redwood Hwy., Suite 3215, Mill Valley, CA 94941
Isaac Stein, Waverley Associates, 525 University Avenue, #700, Palo Alto, CA 94301
James R. Ukropina, O’Melveny & Myers, 400 South Hope Street, Suite 1060, Los Angeles, CA 90071
Ward W. Woods, Jr., Bessemer Securities Corporation, 630 Fifth Avenue, New York, NY 10111-0100

ADMINISTRATIVE ORGANIZATION

EXECUTIVE OFFICERS, 2000-01

President: John L. Hennessy
Provost: John Etchemendy
Vice President for Business Affairs and Chief Financial Officer: to be announced
Vice President for Development: John B. Ford
Vice Provost and Dean of Research and Graduate Policy: Charles H. Kruger
Vice Provost and Dean for Institutional Planning and Operations: to be announced
Vice Provost and Dean of Student Affairs: James Montoya
Chief Executive Officer, Stanford Management Company: Michael McCaffery
Chief Information Officer, Information Technology Systems and Services: Raman Khanna
General Counsel: (Acting) Debra Zumwalt
Interim President and Chief Executive Officer, UCSF Stanford Health Care: David Hunter
University Librarian and Director of Academic Information Resources: Michael A. Keller
Dean of Graduate School of Business: Robert Joss
Dean of Continuing Studies Program: Charles Junkerwart
Dean of School of Earth Sciences: Franklin M. Orr, Jr.
Dean of School of Education: Debra J. Stipek; Interim Dean (Autumn): Denis Phillips
Dean of School of Engineering: James D. Plummer
Dean of School of Humanities and Sciences: Malcolm R. Beasley
Dean of School of Law: Kathleen Sullivan
Dean of School of Medicine: Eugene A. Bauer
Director of Hoover Institution: John Raisian
Director of Stanford Linear Accelerator Center: Jonathan Dorfan

ORGANIZATION

BOARD OF TRUSTEES

Powers and Duties—The Board of Trustees is custodian of the endowment and all properties of the University. The Board administers the invested funds, sets the annual budget, and determines policies for operation and control of the University. The powers and duties of the Board of Trustees derive from the Founding Grant, amendments, legislation, and court decrees. In addition, the Board operates under its own bylaws and a series of resolutions on major policy.

Membership—Board membership is set at 35, including the President of the University who serves ex officio and with vote. Trustees serve a five-year term and are eligible for appointment to one additional five-year term. At the conclusion of that term, a Trustee is not eligible for reelection until after a lapse of one year. Eight of the Trustees are elected or appointed in accordance with the Rules Governing the Election or Appointment of Alumni Nominated Trustees. Four of the Alumni Nominated Trustees must be 35 years of age or under and four older than 35 when elected. They serve a five-year term.


**Officers of the Board**—The officers of the board are a chair, one or more vice chairs, and a secretary. Officers are elected to one-year terms at the annual meeting in June. Their terms of office begin July 1.

**Committees**—Standing committees of the Board are Academic Policy, Planning, and Management; Alumni and External Affairs; Audit; Development; Finance; Land and Buildings; and Medical Center. Special committees include Compensation, Investment Responsibility, Litigation, and Nominations.

**Meetings**—The Board generally meets five times each year.

**THE PRESIDENT**

The Founding Grant prescribes that the Board of Trustees shall appoint the President of the University and that the Board shall give to the President the following powers:

- To prescribe the duties of the professors and teachers.
- To prescribe and enforce the course of study and the mode and manner of teaching.
- Such other powers as will enable the President to control the educational part of the University to such an extent that the President may justly be held responsible for the course of study therein and for the good conduct and capacity of the professors and teachers.
- The President is also responsible for the management of financial and business affairs of the University, including operation of the physical plant.
- The President appoints the following, subject to confirmation by the Board: Provost, Vice President for Business Affairs and Chief Financial Officer, Vice President for Development, and General Counsel.

**COMMITTEES AND PANELS**

University Committees are appointed by and are primarily responsible to the President. Such committees deal with matters on which the responsibility for recommendation or action is clearly diffused among different constituencies of the University. In accordance with the *Report on the Committee Structure of the University*, Academic Council members are appointed to University Committees on nomination of the Senate Committee on Committees and student members on nomination of the Associated Students of Stanford University (ASSU) Committee on Nominations. The President takes the initiative in the appointment of staff members to such committees. Although immediately responsible to the President, University Committees may be called upon to report to the Senate of the Academic Council or the ASSU. Charges to such committees are set by the President on recommendation of the Committee on Committees and others. There are nine standing University Committees, as follows:

- Advisory Panel on Investment Responsibility (AP-IR)
- Committee on Athletics, Physical Education, and Recreation (C-APER)
- Committee on Environmental Health and Safety (C-EHES)
- Committee on Faculty and Staff Benefits (C-FSB)
- Committee on Land and Building Development (C-LBD)
- Committee on Public Events (C-PE)
- Editorial Board of the University Press (EB-UP)
- KZSU Advisory Board (KZSU)
- Panel on Outdoor Art (P-OA)

Additionally there are six standing administrative panels which are appointed by the Vice Provost and Dean of Research and Graduate Study, and which report through him to the President.

- Administrative Panel on Biosafety
- Administrative Panel on Human Subjects in Medical Research-01
- Administrative Panel on Human Subjects in Medical Research-03
- Administrative Panel on Human Subjects in Medical Research-04
- Administrative Panel on Human Subjects in Non-Medical Research-02
- Administrative Panel on Laboratory Animal Care
- Administrative Panel on Radiological Safety

**PROVOST**

The Provost, as the chief academic and budget officer, administers the academic program (instruction and research in schools and other unaffiliated units) and University services in support of the academic program (student affairs, libraries and information resources, and institutional planning). In the absence or inability of the President to act, the Provost becomes the Acting President of the University. The Provost has shares with the President conduct of the University's relations with other educational institutions, groups, and associations.

**Schools of the University**—The program of instruction in the University is organized into seven schools: Graduate School of Business, School of Earth Sciences, School of Education, School of Engineering, School of Humanities and Sciences, School of Law, School of Medicine.

The deans of the schools report to the Provost.

**THE ACADEMIC COUNCIL**

According to the Articles of Organization of the Faculty, originally adopted by the Board of Trustees in 1904 and revised in 1977, the powers and authority of the faculty are vested in the Academic Council consisting of: (1) the President of the University; (2) tenure-line faculty—Assistant, Associate, and Full Professor; (3) nontenure-line faculty—Associate and Full Professor followed by the parenthetical notation (Teaching), (Performance), (Applied Research), or (Clinical); (4) nontenure-line research faculty—Research Assistant Professor, Associate Professor (Research), Professor (Research); (5) Senior Fellows in specified policy centers and institutes; and (6) certain specified officers of academic administration.

In the Spring of 1968, the Academic Council approved the charter for a Senate to be composed of 55 representatives elected by the Hare System of Proportional Representation and, as ex officio nonvoting members, deans of the academic schools and certain major officers of academic administration.

In the allocation of representation, each school constitutes a major constituency. The Senate may create from time to time other major constituencies as conditions warrant. Approximately one-half of the representatives are allocated to constituencies on the basis of the number of students in those constituencies and the remainder on the basis of the number of members of the Academic Council from each constituency.

**COMMITTEES**

Committees of the Academic Council are created by and responsible to the Senate of the Academic Council and are appointed by the Committee on Committees of the Senate. Such committees deal with academic policy matters on which the primary responsibility for action and decision lies with the Academic Council or, by delegation, the Senate. Pursuant to the Senate’s acceptance on September 25, 1969 of the *Report from the Committee on Committees on the Committee Structure of the University* and subsequent Senate action, the Senate has established seven standing Committees of the Academic Council, as follows:

- Committee on Academic Appraisal and Achievement (C-AA)
- Committee on Academic Computing and Information Systems (C-ACIS)
- Committee on Graduate Studies (C-GS)
- Committee on Libraries (C-Lib)
- Committee on Research (C-Res)
- Committee on Undergraduate Admissions and Financial Aid (C-UAFA)
- Committee on Undergraduate Studies (C-US)

The Senate has also created a Planning and Policy Board of the Senate to consider long-range strategic issues of concern to the faculty.

Information regarding charges to these committees is available from the Office of the Academic Secretary to the University.

**ASSOCIATED STUDENTS**

Two weeks after the University opened in 1891, students met to form the Associated Students of Stanford University (ASSU). All registered students are members of the Association. They are governed by the ASSU
Constitution and Bylaws, which was last revised and approved by student vote in April 1999, and approved by the President in September 1999.

**Executive**—The President and Vice President serve as the chief executives and representatives for the Association. The Financial Manager acts as business manager of the ASSU, CEO of Stanford Student Enterprises (SSE) and controller of the Students' Organizations Fund, wherein ASSU and student organization funds are deposited.

**Legislative**—There are two legislative bodies, an Undergraduate Senate and a Graduate Student Council, that work together to determine the Association's budgetary, financial, investment, business, and operating policies. In addition, each entity provides funding for student organizations, recommends student appointments to University committees and advocates on behalf of its constituents. Each body has 15 elected representatives and an elected chair. Both meet regularly to conduct Association business and discuss and act on issues pertinent to student life at Stanford.
Admission and Financial Aid

ADMISSION

UNDERGRADUATE MATRICULATED STUDY

In order to preserve the residential character of the University and to maintain a favorable student-faculty ratio, Stanford has a limited undergraduate enrollment. The anticipated size of the freshman class is 1,600 students. Between 100 and 120 transfer students, entering either the sophomore or junior class, are also admitted each year. For both freshman and transfer admission, the University receives many more applications from qualified students than there are places available.

Stanford’s undergraduate community is drawn from throughout the United States and many other countries. It includes men and women whose abilities, intellectual interests, and personal qualities will allow them to benefit from and contribute to the University’s wide range of teaching and research programs in the humanities, sciences, and engineering. The University admits students with highly developed skills in particular areas, as well as those with versatility in a number of fields. A comprehensive financial aid program aims to promote broad socioeconomic representation. Stanford is committed to meeting the University-computed financial need of each admitted student and, subject to its community and to the education of their fellow students, and proceed to a lifetime of intellectual, personal, and societal accomplishment.

Since application procedures and requirements vary from year to year, specific information regarding application for admission as either a freshman or transfer student should be obtained by writing to the Office of Undergraduate Admission, Stanford University, Stanford, CA 94305-3005.

NONMATRICULATED STUDY

Admission to Stanford as a nonmatriculated student during Autumn, Winter, and Spring Quarters is not routinely approved except under extenuating circumstances. Nonmatriculated students authorized to enroll at Stanford University are not admitted to any Stanford degree program and are permitted to register for a specific period, usually one, two, or three quarters. Financial assistance from Stanford University is not available. Acceptance as a nonmatriculated student does not guarantee subsequent admission as a matriculated student. Students interested in nonmatriculated status during the Autumn, Winter, and Spring Quarters of the next academic year. Awards are seldom made to students who enter the University in Winter, Spring, and Summer quarters; such applicants must meet the same financial aid application requirements as those entering in Autumn Quarter.

Applications may be submitted electronically for graduate programs in the schools of Earth Sciences, Education, Engineering, Humanities and Sciences, and the Biosciences (non-M.D. programs in Medicine). Application instructions may be found at www.stanford.edu/dept/registrar.

The Guide to Graduate Admission and application forms for graduate matriculated study may be obtained from Graduate Admissions, Registrar’s Office, Old Union, Stanford University, Stanford, California 94305-3005, except for the following programs:

Business—Applicants should write to Director of Admissions of the M.B.A., Ph.D., or Sloan Program, Graduate School of Business, Stanford University, Stanford, California 94305-5015 for information and application forms.

Law—Applicants should write to Director of Admissions, School of Law, Stanford University, Stanford, California 94305. The Law School Admissions Test is required.

M.D. Program—Applicants should write to Admissions Committee, School of Medicine, 851 Welch Road, Palo Alto, California 94304 for
NONMATRICULATED STUDY

Grades of colleges and universities of recognized standing who hold a U.S. bachelor's degree or its equivalent are eligible to apply for nonmatriculated graduate student status. This status may be granted to students of demonstrated ability who are not seeking an advanced degree from Stanford University, but who would benefit from course work at Stanford for a variety of reasons. A 3.0 or 'B' grade average in prior studies is required. Nonmatriculated admission is valid only for a given academic year or a part thereof. Students who wish to reenroll in a subsequent academic year must reapply.

Nonmatriculated students are not permitted to enroll in certain courses, such as those in the following departments or programs: Film and Broadcasting courses in Communication; graduate level courses in Psychology; all courses in Computer Science, Economics, Electrical Engineering, International Policy Studies, and the School of Medicine. Nonmatriculated students receive academic credit for courses satisfactorily completed and may obtain an official transcript. They may use University facilities and services. In classes of limited enrollment, students in degree programs have priority. Nonmatriculated students may apply for housing but will have a low priority for assignment. No fellowships, assistantships, or Stanford loans are available for nonmatriculated students.

Nonmatriculated students who later apply for admission to a degree program must meet the standard admission requirements and should not anticipate special priority because of work completed as a nonmatriculated student. Students who are admitted to a degree program may apply a maximum of one year to graduate nonmatriculated study toward the residency requirement for a master's degree and two quarters for the Engineer or Ph.D. degree.

Application forms for nonmatriculated status during the regular academic year are available from the Assistant Dean, Registrar's Office, Old Union, Stanford, CA 94305-3005. Deadlines for applying are included with the forms and are generally two months before the start of the quarter.

Applicants interested in nonmatriculated student status for the Summer Quarter only should contact the Summer Session Office, Building 590, Room 104, Stanford University, Stanford, CA 94305-3005.

POSTDOCTORAL SCHOLARS

Prospective postdoctoral scholars should write directly to the department in which they wish to study.

Postdoctoral scholars who are paid as Research Affiliates through Stanford grants and contracts must enroll as nonmatriculated graduate students each quarter of their appointments. They are thereby eligible for most student benefits. Scholars who are supported by other funds have the option of registering, except in the School of Medicine which requires that all postdoctoral scholars be registered. Postdoctoral scholars must have received the Ph.D. within the last three years or the M.D. within the last six years.

The School of Medicine has an additional special student category, the School of Medicine Fellow, which is open to those holding the M.D. for more than six years or the Ph.D. for more than three years and who have been invited to Stanford to undertake further training in modern medical technology.

Postdoctoral scholars who are not required to register as nonmatriculated students may request Visiting Scholar status. This option is available only to an individual who is visiting from an outside institution or organization, who has a doctoral degree or is a recognized expert in his or her field, and whose source of funding is not Stanford. Appointments are authorized by department chairs. Visiting scholars are not eligible for student benefits.

VISITING RESEARCHERS

In limited instances, it is to the benefit of Stanford faculty to permit persons who have not yet obtained a Ph.D. (or its foreign equivalent) or who are not recognized experts in their fields to engage in research on the Stanford campus using Stanford research facilities. Such instances might include students at other universities who are engaged in graduate-level research in a field of interest to the faculty member, a person doing a laboratory rotation as part of a larger research study or grant, or employees of companies who are conducting research which requires specialized equipment available only at Stanford.

In these instances, since the person is not eligible for Visiting Scholar status, they may be eligible to register as nonmatriculated graduate students in the Visiting Researcher category for a maximum of one year. Invited persons must be qualified to conduct research at a level comparable to that of other Stanford graduate students, and the research must be of benefit to Stanford as well as to the visitor. Admission forms for visiting researchers are submitted to the Registrar's Office by the department issuing the invitation.

Visiting researchers are charged the Permit to Attend for Services Only (PSO) tuition rate quarterly and may waive the University's student medical insurance plan only if they have comparable coverage with another carrier. They may not enroll in or audit any courses, but in quarters they are registered, are eligible for the usual student benefits of nonmatriculated student status. Visiting researchers may apply for housing, but they will have a low priority for assignments. No fellowships, assistantships, or Stanford loans are available for visiting researchers. Stanford cannot certify visiting researchers for deferment of U.S. educational loans. Citizens of other countries who enter the United States to be visiting researchers at Stanford must have an IAP-66 issued by the Bechtel International Center and must register each quarter, including Summer Quarter, to maintain their visa status.

VISAS FOR FOREIGN STUDENTS

All students who are not U.S. citizens or permanent residents must obtain visas for their stay in the United States. The types of visas available for students are the following:

1. Student Visa (F-1), obtained with an I-20 Certificate of Eligibility issued by Stanford University. The graduate student on an F-1 visa must enroll in a full course of study. The accompanying spouse or child enters on an F-2 visa. F-2 visa holders may not work.

2. Exchange-Visitor Visa (J-1), obtained with an IAP-66 Certificate of Eligibility issued by Stanford University or a sponsoring agency. This visa is required for graduate students sponsored by certain agencies, foundations, and governments. In some cases, Exchange-Visitors must leave the United States at the conclusion of their programs, may not change visa status, and may not apply for permanent residency in the United States until they have returned to their home countries for at least two years. The spouse of an Exchange-Visitor enters on a J-2 visa and may, in some cases, obtain permission to work.

The certificate of eligibility is issued to a student accepted for admission only upon receipt of evidence of satisfactory proficiency in the English language and certification of adequate financial support. A student transferring from another school must obtain a new visa with a Stanford certificate of eligibility.

Information on visas is sent to admitted graduate students from the Graduate Admissions Office. Information on visas for postdoctoral scholars and visiting researchers may be obtained from the Bechtel International Center.

The University requires that all students who are not U.S. citizens or permanent residents maintain a visa status that allows registration as students.
FINANCIAL AID

UNDERGRADUATE

The University has a comprehensive need-based financial aid program for its undergraduate students (except some international students) who meet various conditions required by the state or federal government, the University, and other outside donors.

In awarding its own funds, the University assumes that students and their parents (or spouse, in the case of married students) accept the first and primary responsibility for meeting the standard educational costs established by the University. Additionally, Stanford expects financial aid applicants to apply for and use resources from state, federal, and private funding sources, contribute from their earnings during nonenrollment periods (for example, summer) and use student loans and earnings from part-time employment during the academic year to meet educational expenses. If Stanford determines that an applicant and/or her/his family cannot meet these expenses, the University may offer student loans, recommend part-time employment during the academic year, and/or award scholarships or grants to help meet these costs. Stanford’s policy generally is to exclude undergraduate students from being considered financially independent of their parents for University-administered scholarship and grant aid unless the student is an orphan, a ward of the court, at least 25 or has an extremely adverse home situation.

In awarding Stanford financial aid funds to meet need (that is, any gap remaining after reducing the standard budget by the University-determined family resources and any outside resources to which the student is entitled such as state or Pell grants, tuition benefits, and so on), Stanford first offers “self-help,” which includes student loans and an academic year earnings expectation. The University normally expects that during enrollment periods, students will work and borrow up to approximately 16 percent of the standard budget. The self-help expectation may be lower for certain categories of students including those from low-income families, those who are academically in the top five to ten percent of an entering class, and those who bring diversity to the Stanford student body. If the University-determined need is greater than the self-help expectation, Stanford awards scholarship or grant funds to meet the remaining need.

Scholarships or grants from outside private sources may change the University’s financial aid award. If the total in outside scholarships exceeds the need-based earnings expectation and loan portion of the financial aid package, the University then reduces its own scholarship or grant fund to meet the remaining need.

The University considers applicants for its own scholarship and grant support beyond the twelfth quarter only if enrollment is essential in order to complete the minimum requirements for the first baccalaureate degree or major; a total of fifteen quarters is the limit for such aid. Students who enroll for a fifth year in pursuit of a coterminal program, a minor, a second major, a second degree, or the B.A.S. degree are not eligible for University scholarship and grant consideration but may apply for student loans.

APPLICATION AND AWARD NOTIFICATION PROCESS

FILING DEADLINES

<table>
<thead>
<tr>
<th>Prospective freshmen</th>
<th>Early Decision, November 1, 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prospective freshmen</td>
<td>Regular Review, February 1, 2001</td>
</tr>
<tr>
<td>Prospective transfers</td>
<td>March 15, 2001</td>
</tr>
<tr>
<td>Returning students</td>
<td>April 15, 2001</td>
</tr>
</tbody>
</table>

APPLICANT DOCUMENTS

The documents the applicant must submit each year for financial aid consideration vary depending on the applicant’s nationality and the type of funds sought.

U.S. citizens and permanent residents who wish to be considered for all available funding administered by Stanford should submit the following documents. Canadians file the following except the FAFSA.

1. Free Application for Student Aid (FAFSA), which must be processed by the federal processor. California residents must also submit a GPA Verification Form or SAT scores to the California Student Aid Commission (CSAC) by March 2, 2001, for Cal Grant consideration.
2. The PROFILE processed by the College Scholarship Service (CSS).

A complete application for U.S. citizens and permanent residents applying for Stafford loan consideration only includes:

1. Free Application For Federal Student Aid (FAFSA), which must be processed by the federal processor.

A complete application for international students (except Canadians) includes the Foreign Student Financial Aid Application and the Certificate of Finances.

Students whose application materials are filed after the published deadlines, who have not borrowed or worked in prior years, or who have not secured all external funds such as Pell and Cal Grants, can expect higher levels of self-help in their financial aid packages.

Applicants and their parents are required to submit accurate and complete information on all application documents. To monitor for accuracy and reliability of information, the University participates in a U.S. Department of Education project that samples the reliability of the data on a number of applications. The FAO may request documents, in addition to the application materials, to verify this information. Students will have their financial aid funds withheld or canceled and their future registration held if they fail to submit the information requested. Financial aid awards may change as a result of the verification process.

NOTIFICATION DATES

The FAO will notify early decision applicants who apply by the November filing date in December. The FAO will notify the freshman applicants who apply by the February 1 filing date in early April. Transfer applicants who submit complete applications by the March 15 filing date are normally notified of their financial aid award within 10 days of their notice of admission.

The FAO begins mailing award notices to continuing and returning applicants approximately the middle of July. Applicants who file after the filing date may not have a financial aid award or funds secured for disbursement by the Autumn Quarter payment due date.

PAYMENT AND FINANCING OPTIONS

Students whose financial aid is not available at the time registration fees are due may use the University’s Deferred Payment Plan.

Parent loan and financing options may help families of students receiving financial aid meet the expected parent contribution. Many of these options are also available to families who do not qualify or apply for financial aid but feel the need for some extended financial credit to help meet the costs of attendance. Parents should also contact their employers for information about programs that may be available to them as employees’ benefits to help meet college costs.

GRADUATE

Academic departments at Stanford University offer financial support to many graduate students. Funds are most often targeted to doctoral candidates and rarely cover all of a student’s expenses. In addition to Stanford support, students usually need to use long-term loans, savings, liquidated assets, a spouse’s earnings, or parental support. They are expected to study full time in order to attain the degree as soon as possible. Students with families to support or with medical or other special needs should budget income and expenses carefully. Loan funds alone may be insufficient to meet the expenses not covered by the Stanford award.
Students should consider part-time employment only after consultation with their department advisers and if no other alternative is possible. Students fully supported by Stanford are limited to additional employment of no more than eight hours per week; due to visa restrictions, international students may not be similarly employed.

Note—No fellowships, assistantships, or loans are available for nonmatriculated students.

FELLOWSHIPS AND ASSISTANTSHIPS
Fellowships, research assistantships, and teaching assistantships are an integral part of the educational program for many graduate students; they also provide funds for graduate student support. As part of their academic plans for students, departments determine assignments for graduate assistantships and fellowships; they also determine the disposition of funds available for graduate fellowship and assistantship appointments. Academic program, academic merit, and availability of funds are the primary considerations in the awarding of graduate financial support. The availability of aid varies considerably among departments and programs. Support offers range from partial tuition fellowships to awards that provide full tuition and a living stipend. Some departments admit only those students to whom they can offer support or who have guaranteed funds from other outside sources. Other departments may offer admission but are unable to provide financial assistance due to limited financial resources. Very few awards are given for study toward terminal master’s degrees.

Application procedures and deadlines for admission and financial aid are described in the Guide to Graduate Admission. Fellowships and assistantships are normally awarded between March 15 and April 15, in accordance with the Council of Graduate Schools resolution. Acceptance of a Stanford award obliges the student to inform the department of any other support received. The Stanford award may be adjusted (see "Outside Fellowships" below). Recipients of all graduate fellowships and assistantships must register each quarter of their appointment.

POSTDOCTORAL FELLOWSHIPS
Stanford has two categories of postdoctoral scholars. Postdoctoral Research Affiliates are classified as advanced students who are employed on contracts and on research and training grants. Postdoctoral Fellows are categorized as advanced students whose funding is from outside sources, typically foundations and foreign governments. Inquiry should be made directly to the department.

OUTSIDE FELLOWSHIPS
Many Stanford graduate students hold fellowships won in national competition from outside agencies such as the National Science Foundation. Information on application procedures and terms of such fellowship programs may be obtained from reference materials in the applicant’s current academic institution. If not, the student should write for information directly to the national office of the agency or foundation administering the program. A student who receives support from an outside source must notify the department immediately. The Stanford award may be adjusted.

LOANS
Graduate students who believe they will require loan assistance can apply for Federal Stafford Student Loan, Federal Perkins Loan, and University Loan programs. Inquiries regarding loan program terms can be directed to Financial Aid Office at www.stanford.edu/dept/finaid/graid.html or 520 Lasuen Mall, Old Union, Room 322, Stanford, CA 94305-3021; phone (888) FAO-3773 from outside the Bay Area and (650) 723-3058 locally. International students who are not permanent residents are not eligible for government or University long-term loans.

Application—(The following information applies to all graduate students, except those in the schools of Law and Business and in the M.D. program in the School of Medicine, who should receive information about the aid application process through their respective schools.) Graduate student loan information is available on the website above and the brochure is sent after admission; a tear off portion of that brochure may be used to request a graduate loan application packet, including detailed loan program information, forms, and instructions. Required application documents are:
1. The results of filing the Free Application for Federal Student Aid (FAFSA) with the federal processor.
2. Stanford Graduate Supplemental Application (online at www.stanford.edu/dept/finaid/gdocs.html).

Students who anticipate the need to use loan proceeds to pay Autumn Quarter bills should have their completed application filed with the FAO by the June prior to the beginning of the academic year. The FAO will notify the student of loan eligibility, which is based on a review of computed financial need, satisfactory academic progress, level of indebtedness, credit history, and availability of funds.

Debt Management—The University encourages wise debt management. Software is available to help students plan for future repayment.

Short-Term Loans—Emergency loans are available to all students with a good credit history, including international students, upon demonstration of ability to repay the loan within three months. These loans are not available to pay University bills.

COTERMINAL STUDENTS
Stanford undergraduate scholarships and grants are reserved for students in their first four years of undergraduate study at Stanford. University graduate fellowships are rarely given to coterminal students, but some departments may award research and teaching assistantships as part of the educational program to certain coterminal master’s students who are eligible for such appointments in the quarter after they have completed 180 units. Students on 50 percent assistantships register for 9 units per quarter and accrue 62 percent of a full-tuition quarter of residency; such assistantships provide a stipend and some tuition allowance. Most private and federal graduate fellowships are awarded only to students who have received the bachelor’s degree.

HONORS COOPERATIVE PROGRAM
Under a graduate cooperative program in engineering and science, employees from over 200 companies in the San Francisco Bay area are released from work, with full compensation, to attend regular classes at Stanford. Most of these companies have joined a Stanford four-channel television network that enables students to observe live lectures with talk-back privileges in their own plants. For a list of participating companies, write to the Stanford Center for Professional Development, 496 Lomita Mall/Durand Building, Stanford University, Stanford, CA 94305-4036.

VETERANS’ BENEFITS
Liaison between the University, its students, and the various federal, state, and local agencies concerned with veterans’ benefits is provided by the Office of the Registrar located in the Old Union Building. All students eligible to receive veterans’ benefits while attending the University are urged to complete arrangements with the appropriate agency well in advance of registration.
Tuition, Fees, and Housing

ASSESSMENTS

TUITION

Regular tuition for the 2000-01 academic year, payable Autumn, Winter, and Spring Quarters, is as follows:

- All departments and schools (except those below) 8,147
- Graduate Division in Engineering 8,687
- Graduate School of Business 9,632
- School of Medicine (M.D. Program) 9,902
- School of Law (payable Autumn and Spring semesters) 13,863
- J.D./M.B.A. Program (payable Autumn and Spring semesters) 14,058

Regular tuition fees apply to the undergraduate Overseas Studies and Stanford in Washington programs. For Summer Quarter tuition rates and policies, see the Stanford University bulletin, Summer Session Catalogue, 2001.

A coterminal student is subject to graduate tuition assessment and adjustment policies once graduate standing is reached. See student policies and procedures, as described under Residency and Unit Requirements in Coterminal Programs in the "Graduate Degrees" section of this bulletin.

Eligibility for registration at reduced tuition rates is described below. Tuition exceptions may also be made for illness, disability, pregnancy, new-parent relief, or other instances at the discretion of the Registrar. No reduction in tuition charges is made after the first two weeks of the quarter.

All students are strongly advised, before registering at less than the regular full-tuition rate, to consider the effects of that registration on their degree progress and on their eligibility for financial aid and awards, visas, deferment of student loans, and residency requirements.

The University reserves the right to change at any time, without prior notice, tuition, room fees, board fees, or other charges.

UNDERGRADUATE STUDENTS

During Autumn, Winter, and Spring quarters, undergraduates are expected to register at the regular full-tuition rate. Undergraduates who have completed at least twelve full-time quarters may petition to register at the 8-, 9-, or 10-unit rate for their final quarter. Undergraduate dual degree students must complete at least fifteen full-time quarters before petitioning for reduced tuition.

Permit to Attend status can be granted for one quarter on a unit-basis to those for whom it is academically appropriate. The Permit to Attend rate is $2,020 per quarter in 2000-01. Undergraduates in the terminal quarter who are completing honors theses or clearing incomplete grades may petition, on a one-time basis, for Permit to Attend for Services Only registration. That rate is $995 per quarter in 2000-01 and does not permit any course enrollment or auditing. Further information about the Permit to Attend status is available from the Registrar’s Office.

During Summer Quarter, all Stanford undergraduates may register on a unit-basis (minimum 3 units).

GRADUATE STUDENTS

Matriculated graduate students are expected to register at the full-tuition rate (11 or more units during the regular academic year) applicable to their degree program, unless they are in a category which makes them eligible to request reduced tuition.

The following reduced-tuition categories can be requested by matriculated graduate students in the final stages of their degree programs:

1. Advanced Graduate Registration (AGR): doctoral students who have been admitted to candidacy, registered for all required courses, and completed nine quarters of residency may request AGR status for 9-unit registration.

2. Terminal Graduate Registration (TGR): doctoral students who have been admitted to candidacy, completed all required courses and degree requirements other than the University oral exam and dissertation, accrued 10.5 quarters of residency, and submitted a Doctoral Dissertation Reading Committee form may request Terminal Graduate Registration status to complete their dissertations. Students pursuing Engineer degrees may apply for TGR status after admission to candidacy, completion of all required courses, and six quarters of residency. Students enrolled in master's programs may apply for TGR status upon completion of all required courses and three quarters of residency only if their program requires a final master's project.

TGR status may also be granted for one quarter only to a graduate student who is returning after a leave of absence or after reinstatement, or to graduate students who register for one final term to take a University Oral Examination, submit a thesis or dissertation, or file an Application to Graduate. Doctoral students applying for one-quarter TGR status must also meet the doctoral criteria above except that they need only nine quarters of residency. Requirements for one-quarter TGR for master's and Engineer students are as above, but master's students need not be in a program with a final writing project requirement to qualify.

Each quarter, all TGR students must enroll in the 801 (for master's and Engineer students) or 802 (for doctoral students) course in their department for zero units, in the appropriate section for their adviser. After the first TGR quarter, this enrollment will be conducted by the Registrar's Office if the TGR student is registered by the Friday before the study list deadline and if the TGR student has an 801 or 802 enrollment in a previous quarter. Enrollments will not be created for the TGR student who is attending a professional school. TGR students register at a special tuition rate: $995 in 2000-01. Within certain restrictions, TGR students may enroll in additional courses, at the appropriate unit rate.

3. Graduate Final Requirement Registration: graduate students who need only a few remaining units to complete degree requirements or to qualify for TGR status, may register for one quarter on a unit basis (3 to 8 units) to cover the deficiency. This status may be used only once during a degree program.

Additional information on these registration categories is available from the Degree Progress Office in the Old Union.

Matriculated graduate students who have Stanford fellowships or assistantships that require less than full-tuition registration may register at the unit rate required by their award. Honors Cooperative students register at the unit rate.

During the Autumn, Winter, and Spring quarters, matriculated graduate students in most departments may register at the 8-, 9-, or 10-unit rate if their enrollment plans are accepted by their departments. Students in the departments of Applied Physics, Mathematics, and Statistics, because of department affiliation with the Honors Cooperative program, are not eligible to register at less than the full-tuition rate, unless they are eligible for one of the special categories above or a departmentally-approved exception. Students in the School of Engineering may register at the 9-unit rate. Students in the schools of Law and Business, or the M.D. program in the School of Medicine, should consult appropriate school officers about tuition reduction eligibility.

Tuition exceptions may also be available for students who are faculty spouses, regular Stanford employees, or full-time educators in the Bay Area.

During Summer Quarter, most matriculated graduate students may register on the unit basis for 3 or more units. Students in schools and departments affiliated with the Honors Cooperative program, as listed above, may not register below the 12-unit rate (9-unit minimum in Statistics only).

Nonmatriculated graduate students pay the same tuition rates as matriculated students, but must register at the 8-unit rate or above. Postdoctoral scholars who are registered as students and visiting researchers
do not enroll in courses and pay the TGR rate. Within certain restrictions, postdoctoral students may enroll in courses if the appropriate unit rate for tuition is paid.

INTERNATIONAL STUDENTS

F1 or J1 visas are required by the U.S. Immigration and Naturalization Service. International students must be registered as full-time students during the academic year. Summer Quarter registration is not required. International graduate students comply with immigration regulations while enrolled for partial tuition if their Stanford fellowships or assistantships require part-time enrollment, if they are in AGR or TGR status, or if they are in the final quarter of a degree program. Nonmatriculated international students must register for at least 8 units.

FEES

APPLICATION FEE

Contact the Undergraduate Admissions Office for information about the undergraduate application fee and the Graduate Admissions section of the Registrar's Office for the current graduate application fee. Application fees for the School of Law, the School of Medicine, and the Graduate School of Business vary by program. Fees are payable at the time of application and are not refundable.

ASSU FEES

The Associated Students of Stanford University (ASSU) fees are established by student vote in Spring Quarter. Fees directly fund activities of student organizations and not operations of ASSU. The 2000-01 fees are:

Undergraduates—Autumn, $62; Winter, $57; Spring, $62
Graduates—Autumn, $23; Winter, $24; Spring, $25
Law—Autumn, $23; Spring, $49

Fees are assessed each term. All fees are refundable. Refunds can be requested during the first three weeks of each quarter per instructions advertised in the Stanford Daily. Those eligible are mailed refund checks by the eighth week of the quarter or receive credit on their University bill.

DOCUMENT FEE

Stanford charges a one-time Document Fee to all students admitted to new degree or non-degree programs in 1993 or later. The fee is paid once only, regardless of the number of degrees a student may ultimately pursue. It covers the cost of a variety of University administrative services such as enrollment and degree certification, course drops and adds, diplomas, and official transcripts and their production.

HEALTH INSURANCE FEE

The University requires all registered students to carry medical insurance to provide coverage for services not provided by Cowell Student Health Services. Students are enrolled in and charged for the Stanford student health insurance plan, unless they have completed waiver procedures by the second day of instruction. Those who carry medical insurance through an alternate carrier are generally eligible for waiver of the health insurance fee.

SPECIAL FEES

New Student Orientation Fee—A fee is charged to all entering undergraduates for the costs of orientation, including room and board, and for the cost of class dues to provide funds for later activities of the class.

School of Law Course Materials Fee—A fee is charged each semester to School of Law students for supplementary course materials. Late Fees—Charges are imposed for late registration and late submission of study lists. Amounts are listed in the quarterly Time Schedule.

Laboratory Fee—Students in chemistry laboratory courses are charged a nonrefundable fee.

Music Practice; Athletics, Physical Education, Recreation; and Dance—Courses for which special fees are charged are indicated in the Time Schedule.

Dissertation Fee—Each Ph.D., D.M.A., and Ed.D. candidate is charged a fee to cover the cost of microfilming and binding the dissertation and the cost of publishing the abstract.

International Scholar Service Fee—A one-time fee for Visa authorization documents is charged to international postdoctoral and visiting scholars.

Vehicle Registration Fee—Students must register their motor vehicles with the campus Department of Public Safety. Parking permits may be purchased at Parking and Transportation, 855 Sierra Street.

HOUSING

Bulletins with further information on housing rates are Summer Session Catalogue, 2001, for Summer Quarter; School of Law for School; Overseas Studies for Overseas Centers.

Campus housing rates are generally below local area market rents. The approximate room rates for the 2000-01 academic year are as follows:

<table>
<thead>
<tr>
<th>Residences</th>
<th>Aut</th>
<th>Win</th>
<th>Spr</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate Single Student Residences:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dormitories and University-operated houses</td>
<td>$1,420</td>
<td>$1,299</td>
<td>$1,282</td>
<td>$4,001</td>
</tr>
<tr>
<td>Theme or self-operated houses</td>
<td>1,703</td>
<td>1,559</td>
<td>1,539</td>
<td>4,801</td>
</tr>
<tr>
<td>Co-ops, Fraternity, Sorority, or student-cleaned houses with professional cooks</td>
<td>1,519</td>
<td>1,391</td>
<td>1,372</td>
<td>4,282</td>
</tr>
<tr>
<td>Miracles (apartments)</td>
<td>1,603</td>
<td>1,468</td>
<td>1,449</td>
<td>4,520</td>
</tr>
<tr>
<td>Suites</td>
<td>1,586</td>
<td>1,453</td>
<td>1,433</td>
<td>4,472</td>
</tr>
<tr>
<td>Graduate Single Student Residences:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dormitories (single occupancy)</td>
<td>1,337</td>
<td>1,182</td>
<td>1,166</td>
<td>3,845</td>
</tr>
<tr>
<td>Dormitories (double occupancy)</td>
<td>975</td>
<td>862</td>
<td>851</td>
<td>2,688</td>
</tr>
<tr>
<td>Lillore Green Rains Houses (apartments)</td>
<td>1,648</td>
<td>1,457</td>
<td>1,438</td>
<td>4,543</td>
</tr>
<tr>
<td>Richard W. Lyman (apartments)</td>
<td>1,648</td>
<td>1,457</td>
<td>1,438</td>
<td>4,543</td>
</tr>
<tr>
<td>Schwab Residential Center (apartments)</td>
<td>2,402</td>
<td>2,123</td>
<td>2,095</td>
<td>6,620</td>
</tr>
<tr>
<td>Escondido Village (single student apartments)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Studio (single occupancy)</td>
<td>1,993</td>
<td>1,761</td>
<td>1,738</td>
<td>5,492</td>
</tr>
<tr>
<td>1 bedroom (double occupancy)</td>
<td>1,157</td>
<td>1,022</td>
<td>1,009</td>
<td>3,188</td>
</tr>
<tr>
<td>2 bedroom (double occupancy)</td>
<td>1,648</td>
<td>1,457</td>
<td>1,438</td>
<td>4,543</td>
</tr>
<tr>
<td>2 bedroom (triple occupancy)</td>
<td>1,157</td>
<td>1,022</td>
<td>1,009</td>
<td>3,188</td>
</tr>
<tr>
<td>3 bedroom</td>
<td>1,491</td>
<td>1,318</td>
<td>1,301</td>
<td>4,110</td>
</tr>
<tr>
<td>Couples without Children:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escondido Village</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 bedroom</td>
<td>2,899</td>
<td>2,562</td>
<td>2,529</td>
<td>7,990</td>
</tr>
<tr>
<td>2 bedroom loft</td>
<td>3,298</td>
<td>2,912</td>
<td>2,876</td>
<td>9,086</td>
</tr>
<tr>
<td>Students with Children:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escondido Village</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 bedroom</td>
<td>$897 per month</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 bedroom</td>
<td>$1,028 per month</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 bedroom</td>
<td>$1,242 per month</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 bedroom</td>
<td>$1,475 per month</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* All rates are approximate and subject to minor changes.

All rates are per student. Room rates are charged quarterly on the University Bill. Information on payment options and procedures is discussed in housing assignment information from Housing Assignment Services and is available in complete detail from the Bursar's Office, Old Union, Room 105, Stanford University, Stanford, CA 94305.

A quarterly house dues fee for students is generally determined by the local staff and/or residents of the house and may be included with room and board charges on the University Bill.

MEAL PLANS*

Meal plan rates are as follows for the 2000-01 academic year:

<table>
<thead>
<tr>
<th>Meal Plans</th>
<th>Quarterly Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Traditional&quot; Meal Plans (all-you-can-eat): for residents of Braner, Lagonita, Florence Moore, Roble, Sterling Quad, Stern, and Wilbur</td>
<td></td>
</tr>
<tr>
<td>19 meals/week</td>
<td>$1,437</td>
</tr>
</tbody>
</table>
PAYMENTS

All charges and credits from offices within the University are aggregated in a student's individual account and presented on the University Bill. The bill may include tuition, housing, food service, ASSU fees (special student-approved association fees set by the ASSU), health insurance, and any miscellaneous charges incurred such as music lessons, cleaning, or re-keying charges. All amounts are due and payable upon receipt of the University Bill, but term-based charges (that is, tuition, room and board, ASSU, and health insurance fees) are always due by the day before term classes begin, whether or not a correct bill has been received. If term-based charges are added after the start of the term, they must be paid within 24 hours of the add date to avoid late fees. A miscellaneous charge will be subject to late fees 30 days after the first bill for it has been issued.

A Student Account (and its associated University Bill) may be paid with personal check (drawn on U.S. banks in U.S. funds), cash, scholarships, loan proceeds (for example, Perkins, Stafford, or University-is-issued), or proceeds of loans to parents (for example, CLAS, PLUS). Payments must be made in a form acceptable to the University. Shortfalls from any of the above categories may be made up in whole or in part from the University's Deferment Loan Program (described below) for matriculated students. The University does not accept credit card payments.

LATE PAYMENT

All charges recorded in a Student Account must be paid by 5 p.m. on the day preceding the first day of instruction whether or not a bill has been received. Payment made on a Student Account after that date is subject to an additional charge in accord with the following fee schedule:

<table>
<thead>
<tr>
<th>Amount</th>
<th>Late Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25</td>
<td>if payment is made on or after the first day of instruction, but during the first week of the term</td>
</tr>
<tr>
<td>$40</td>
<td>if payment is made during the second week of the term</td>
</tr>
<tr>
<td>$55</td>
<td>if payment is made during the third week of the term</td>
</tr>
<tr>
<td>$75</td>
<td>if payment is made during the fourth week of the term</td>
</tr>
<tr>
<td>$100</td>
<td>if payment is made during the fifth week of the term</td>
</tr>
<tr>
<td>$125</td>
<td>if payment is made during the sixth week of the term or later</td>
</tr>
</tbody>
</table>

* All rates are approximate and subject to change.

† An administrative fee is withheld from the a la carte dollars given to spend. Up to $50 in a la carte points may be carried over each quarter until Spring Quarter.

DEFERMENT LOAN PROGRAM

Deferment Loans (also known as "deferments") are short-term loans and are available to matriculated students at the beginning of each term. The proceeds from a Deferment Loan may only be used to pay current term fees. The Deferment Loan may be used to avoid the application of Late Payment Fees described above. The terms of the Deferment Loan are:

1. $20 Deferment Loan Application Fee.
2. An annual interest rate of 10 percent assessed on the Deferment Loan principal until the date payment is received or until the due date, whichever comes first, in accord with the following schedule:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Deferment Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn</td>
<td>November 10, 2000</td>
</tr>
<tr>
<td>Winter</td>
<td>February 22, 2001</td>
</tr>
<tr>
<td>Spring</td>
<td>May 17, 2001</td>
</tr>
<tr>
<td>Summer</td>
<td>July 25, 2001</td>
</tr>
</tbody>
</table>

3. Any portion of the amount of the loan may be prepaid before the due date without prepayment penalty.
4. Amounts remaining unpaid after the due date are delinquent and subject to a late charge of $25.00, and additional interest at the maximum rate permitted by California law (including California Financial Code §28000), or such lesser rate as the University may determine, in its sole discretion, from the due date until paid.

DELINQUENT ACCOUNTS

Delinquent accounts (such as for tuition, fees, housing, meal plans, or for other amounts owed to the University) are reported to the Registrar’s Office, which places a "hold" on the student’s further registration and on the release of transcripts and diplomas until the past-due accounts have been paid. In addition, delinquent accounts may be reported to one or more national credit bureaus and/or commercial collection agencies.

REFUNDS

TUITION

Students who withdraw from the University before the end of a term may receive refunds of portions of their tuition as described below.

ANNULLED REGISTRATION

Students who withdraw from the University voluntarily on or before the first day of instruction may have their registrations annulled. Tuition is refunded in full. Such students are not included in University records as having registered for the term and new students will not secure any privileges for admission for any subsequent quarter as returning students. An annulment does not automatically cancel health coverage unless the annulment is granted by the first day of instruction. Financial aid recipients should be aware that a proportion of any refund is returned to the various sources of aid.

CANCELLATION OF REGISTRATION OR SUSPENSION FOR CAUSE

Students who have their registrations canceled or are suspended from the University for cause receive refunds on the same basis as those receiving leaves of absence unless otherwise specified in the disciplinary action taken. A student whose registration is canceled less than one week after the first day of instruction for an offense committed during a preceding quarter receives a full refund of tuition fees.

INSTITUTIONAL INTERRUPTION OF INSTRUCTION

It is the University’s intention to do everything possible to avoid taking the actions described in this paragraph. However, should the University determine that continuation of some or all academic and other campus activities is impracticable, or that their continuation involves a high degree of physical danger to persons or property, activities may be curtailed and students requested or required to leave the campus. In such an
event, arrangements will be made as soon as possible to offer students the opportunity to complete their courses, or substantially equivalent work, so that appropriate credit may be given. Alternatively, the University may determine that students will receive refunds on the same basis as those receiving leaves of absence, or on some other appropriate basis.

LEAVE OF ABSENCE

A student in good standing who withdraws from the University after the first day of instruction, but before the end of the first 60 percent of the quarter, may file a petition for a leave of absence and tuition refund with the Registrar’s Office. A leave of absence after the first 60 percent of the quarter is only granted for approved health and emergency reasons. Students granted a leave of absence are shown on the University transcript as having registered for the term. Courses in which the student was enrolled after the drop deadline will appear on the student’s record and will show the grade of ‘W’ (withdrawn). Undergraduates who take a leave while in good standing may enroll in the University for a subsequent quarter with the privileges of a returning student. Graduate students are subject to special registration requirements (see Leave of Absence in the “Graduate Degrees” section of this bulletin).

TUITION REFUND SCHEDULE

Students who take a leave of absence are eligible for a tuition refund during the first 60 percent of the quarter. Refunds are calculated on a per diem basis (including weekends and University holidays) starting the first day of instruction of each quarter. Tuition will be charged on a daily basis (including weekends and holidays) through the first 60 percent of the quarter. After the first 60 percent of the quarter, students are liable for the full amount of tuition that they were charged.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Standard Tuition</th>
<th>Grad. Engr. Tuition</th>
<th>Grad. Engr. Tuition 11 or more units</th>
<th>Grad. Engr. Tuition 9 units</th>
<th>Grad. Engr. Tuition 8 units or less</th>
<th>Standard Tuition 11 or more units</th>
<th>Standard Tuition 9 units</th>
<th>Standard Tuition 8 units or less</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn</td>
<td>$102</td>
<td>$63</td>
<td>$109</td>
<td>$67</td>
<td>Nov. 13</td>
<td>$109</td>
<td>$67</td>
<td>Nov. 13</td>
</tr>
<tr>
<td>Winter</td>
<td>$110</td>
<td>$69</td>
<td>$117</td>
<td>$73</td>
<td>Feb. 21</td>
<td>$69</td>
<td>$73</td>
<td>Feb. 21</td>
</tr>
<tr>
<td>Spring</td>
<td>$103</td>
<td>$64</td>
<td>$110</td>
<td>$68</td>
<td>May 19</td>
<td>$64</td>
<td>$68</td>
<td>May 19</td>
</tr>
</tbody>
</table>

For example: you are an undergraduate student who was charged the standard tuition rate of $8,147 for Autumn Quarter. You become ill and inform the Registrar’s Office on the 17th day of the quarter that you want to take a leave of absence. You will be charged for 17 days of tuition ($102 x 17 days) or $1,734.

Separate schedules exist for students paying the medical, law, graduate business, or summer session rates. These schedules are available at the Registrar’s Office and via http://www.stanford.edu/dept/registrar/registration.

Tuition refunds are calculated based on the date that the student informed the Registrar’s Office in person, by mail, or by e-mail, of his or her intention to take a leave of absence. If the student is incapacitated and thus not able to contact the Registrar’s Office, the date of the leave of absence is the date on which the Registrar’s Office was informed of the student’s incapacity by the student’s parents or other close relative or partner, or by an official in one of the following University offices: the Dean of Students, Residential Education, Cowell Student Health, Housing Assignment Services, Financial Aid, the Vice Provost for Undergraduate Education, the Vice Provost for Student Affairs, an academic dean’s office, or an academic department.

ROOM AND MEAL PLAN REFUNDS

Students assigned to a University residence are subject to the conditions of the University Residence Agreement. Under this agreement, single students and couples without children are required to live somewhere in the University residence system for the entire academic year. Students with children may give notice of termination of occupancy for the end of each academic term. Room refunds are made only when students move out of the residence system and withdraw from the University. Students in all-male fraternities or all-female sororities are billed directly by the fraternity or sorority, and refunds are arranged between the student and the fraternity or sorority.

A meal plan refund is based on the date when a student moves out of his or her University residence. If a student uses the meal plan after that date, an additional daily charge will incur.

Any decision to refund prepaid room and meal plan charges or to waive liability for deferred charges shall ultimately be made at the sole discretion of the University. Students with questions about refunds should contact Housing Assignment Services (for room refunds) or the central office of University Dining Services (for meal plan refunds).

HOUSING

University housing is available to registered Stanford students. Planning of educational programs, counseling and crisis intervention by residence deans, and administration of residence offices is coordinated by the department of Residential Education and Graduate Residences (http://rescomp.stanford.edu/resed.html), or telephone (650) 725-2800.

Dining services and custodial services and maintenance are provided by Student Housing and Dining Services (http://www.stanford.edu/dept/hds/), or telephone (650) 723-2287.

Information on University housing assignments, options, policies, application procedures, and deadlines, as well as community housing services, may be obtained from Housing Assignment Services, Old Union, Room 214, Stanford University, Stanford, CA 94305-3012, or telephone (650) 725-2810.

UNDERGRADUATE STUDENT RESIDENCES

RESIDENTIAL EDUCATION PROGRAM

The program in Residential Education provides for undergraduates certain dimensions of a college experience within a large research university. The essential conviction behind the Stanford residence program is that formal teaching, informal learning, and personal support in residences play an important role in a Stanford education. Residential Education programs extend the classroom into the residences and complement the academic curriculum with activities and experiences that contribute to students’ preparation for a life of leadership, intellectual engagement, citizenship, and service.

ASSIGNMENT TO UNDERGRADUATE RESIDENCES

Approximately 93 percent of undergraduates live in University housing (excepting students studying abroad during the academic year). All freshmen are required to live in University residences for educational reasons and are automatically assigned housing following admission. Residence assignments for continuing undergraduates are made on the basis of an annual lottery (called the Draw) and quarterly waiting lists. Undergraduates who enter Stanford as freshmen are guaranteed four years of University housing if they apply by the appropriate Draw deadlines and are willing to live anywhere on campus. Transfer students are guaranteed two or three years of housing, based on their entering class standing. For further information concerning housing eligibility, contact Housing Assignment Services.

Undergraduate residences include traditional dormitories, academic theme, cross cultural and focus houses, ethnic theme houses, student-managed and cooperative houses, apartments, suites, fraternities, and sororities.

GRADUATE STUDENT RESIDENCES

RESIDENCE PROGRAM

The University’s philosophy of graduate student housing is based on the premise that supporting high quality graduate scholarship and research is central to the mission of the University. By providing affordable housing in proximity to academic resources, the University creates an environment conducive to research and intellectual dialogue among students, their peers, and faculty members.
ASSIGNMENT TO GRADUATE RESIDENCES

Approximately 46 percent of matriculated graduate students at the home campus live in University housing. Residence assignments are made on the basis of an annual lottery and quarterly waiting lists. New matriculated single students and couples without children who apply for housing by the Lottery deadline and are willing to live in any residence for which they are eligible are guaranteed housing their first year at Stanford. New matriculated master's students with children who apply by the Lottery deadline are assured two years of on-campus housing while registered, and new matriculated doctoral students with children who apply by the Lottery deadline are assured six years of on-campus housing while registered. At Stanford University, new matriculated students are students who are in a graduate program for the first time. Students starting a second graduate degree are not considered new matriculated students and therefore are not guaranteed housing.

Single graduate students may request assignment to graduate apartments and dormitories, or to spaces in six undergraduate cooperative houses.

One-, two-, three-, and four-bedroom apartments are provided for couples without children and students with children, both graduate and undergraduate, based on student status and the number of dependents. Couple housing is available to students who are married and to students who have a same-sex or opposite-sex domestic partner. At Stanford University, a domestic partnership is defined as an established, long-term partnership with an exclusive mutual commitment in which the partners share the necessities of life and ongoing responsibility for their common welfare. Housing for students with children is available to married couples, domestic partners, and single parents who have dependent children living with them. Housing is not provided for extended families, including the parents and siblings of students, or live-in day care staff.

COMMUNITY HOUSING

Community Housing Services maintains computerized listings of private rooms, houses, and apartments in surrounding communities that are available to students desiring to live off campus. Students must make rental arrangements directly with landlords. Information and publications on community housing may be obtained from Community Housing Services, Old Union, Room 214, Stanford University, Stanford, CA 94305-3012, or telephone (650) 723-3906. During early September, temporary accommodations are available in a student dormitory at a modest charge for students searching for off-campus housing for Autumn Quarter. Contact Summer Conference Services for more information at (650) 725-1429.

RESIDENCE DEANS

Residence Deans provide assistance to on- and off-campus students. They can advise students about academic and personal matters, occasionally intervene directly in behavioral problems/mental health concerns, and assist with personal emergencies. Advice is also available on issues of academic probation or suspension, leaves of absence, special concerns of women or minorities, and administrative matters. Residence Deans work closely with the Dean of Students and other University offices. They are assigned to specific residences and to off-campus students; for further information, call Residential Education at (650) 725-2800.
Undergraduate Degrees

DEGREE PROGRAMS

BACHELOR OF ARTS (A.B.), BACHELOR OF SCIENCE (B.S.)

Stanford University confers the degree of Bachelor of Arts (A.B.) or the degree of Bachelor of Science (B.S.) on those candidates who have been recommended by the Committee on Academic Appraisal and Achievement (C-AAA), who have applied in advance for conferment of the degree, and who have fulfilled the following requirements:

1. A minimum of 180 units of allowable University work. (As described below, units above the allowable limits for activity courses and for courses taken on a satisfactory/no credit basis cannot be counted towards the 180 minimum.)

2. The Writing, General Education, and Language Requirements (see below).

3. Curricular requirements of at least one major department or program and the recommendation of the department(s). (Descriptions of curricular and special degree requirements are included in each department's section of this bulletin.)

4. A minimum of 90 units (including the last 15) at Stanford. In special cases, students who have earned at least 135 units in resident work and who have completed the Writing, General Education, and Language Requirements, as well as all major requirements, may petition for a waiver of the last 15 units-in-residence requirement.

Stanford confers the Bachelor of Science degree on candidates who fulfill these requirements in the School of Earth Sciences, in the School of Engineering, or in the departments of Applied Physics, Biological Sciences, Chemistry, Mathematics, or Physics in the School of Humanities and Sciences. The University also awards B.S. degrees to candidates in the Program in Science, Technology, and Society; in the Program in Symbolic Systems; and, when appropriate, in the Program for Individually Designed Majors. Candidates who fulfill these requirements in other schools or departments receive the Bachelor of Arts degree.

Students who complete the requirements for two or more majors which ordinarily would lead to the same degree (A.B. or B.S.) should review "The Major" section of this bulletin to ensure that they have an understanding of the requirements for multiple or secondary majors.

BACHELOR OF ARTS AND SCIENCE (B.A.S.)

The University confers the degree of Bachelor of Arts and Science (B.A.S.) on candidates who have completed, with no overlapping courses, the curricular requirements of two majors which ordinarily would lead to different bachelor's degrees (that is, a Bachelor of Arts degree and a Bachelor of Science). These students must have applied in advance for graduation with the B.A.S. degree instead of the A.B. or B.S. degree, been recommended by the C-AAA, and have fulfilled requirements 1, 2, and 4 above in addition to the requirements for multiple majors.

Students who complete the requirements for both majors without overlapping courses are not eligible for the B.A.S., but may apply to have a secondary major recorded on their transcripts. (See "The Major" section below.)

DUAL BACHELOR'S DEGREES (CONCURRENT A.B. AND B.S.)

A Stanford undergraduate may work concurrently toward both an A.B. and a B.S. degree. To qualify for both degrees, a student must complete:

1. A minimum of 225 units of University work. (As described below, units above the allowable limits for activity courses and for courses taken on a satisfactory/no credit basis cannot be counted towards the 225 minimum.)


3. The curricular requirements of two majors (one of which leads to a Bachelor of Arts degree and the other to a Bachelor of Science degree).

4. A minimum of 135 units (including the last 15) at Stanford. In special cases, as described above, students may petition for waiver of the last 15 units-in-residence requirement.

A student interested in dual bachelor's degrees should file a statement of intention with the Registrar's Office no later than two quarters in advance of completing the program. The statement should be submitted on a standard petition form along with recommendations of appropriate representatives from the two departments whose major requirements the student is expecting to fulfill.

Students who do not meet the higher unit and residence requirements of the dual degree option may be eligible instead for the B.A.S. degree as described above.

SECOND BACHELOR'S DEGREE

Stanford does not award a second Bachelor of Arts degree to an individual who already holds a Bachelor of Arts, nor a Bachelor of Science degree to an individual who already holds a Bachelor of Science degree. However, the holder of a Bachelor of Arts degree from Stanford may apply to the Subcommittee for Exceptions to Academic Policy for admission to candidacy for a Bachelor of Science degree, and the holder of a Bachelor of Science degree from Stanford may apply for candidacy for a Bachelor of Arts degree. A recommendation of the major department for the second bachelor's degree must accompany the application.

Generally, a student may not apply for a second bachelor's degree after having been a graduate student, although a student may submit a petition for exception. The Office of the Registrar's Academic Standing section in the Old Union, room 141, reviews these petitions. A student approved for this program may register as an undergraduate and is subject to the usual rules and regulations affecting undergraduates. Requirements for a second Stanford bachelor's degree are the same as those described above for dual bachelor's degrees.

COTERMINAL BACHELOR'S AND MASTER'S DEGREES

The coterminal degree program allows undergraduates to study for a master's degree while completing their bachelor's degree(s) in the same or a different department. Undergraduates with strong academic records may apply for admission to a coterminal master's program as early as the eighth quarter (or upon completion of 105 units) but no later than early in the 11th quarter of undergraduate study, and at least four quarters in advance of the anticipated date of conferral of the master's degree. Units completed during summer quarters, as well as undergraduate transfer credit, are also counted towards quarters of undergraduate study. Students who wish to apply for a master's program after these deadlines must apply through the regular graduate admissions process.

To apply for admission to a coterminal master's program, students must submit to the prospective graduate department the following: coterminal application, statement of purpose, preliminary program proposal, two letters of recommendation from Stanford professors, and a current Stanford transcript. Graduate Record Examination (GRE) scores or other requirements may be specified by the prospective department.

For coterminal students, the quarter following completion of 180 units (or 225 units for dual undergraduate degree students) is identified as the first graduate quarter. Beginning with this quarter, coterminal students are subject to graduate student policies and procedures, as described in the "Graduate Degrees" section of this bulletin. These policies include continuous registration or leave of absence for quarters not enrolled (rather than the stopping out procedure for undergraduates) and minimal progress guidelines.

In the first graduate quarter, a coterminal student is assigned an adviser in the master's department for assistance in planning a program of study to meet the requirements for the master's degree. The plan is outlined on the Program Proposal for a Master's Degree, which is approved
by the master's department by the end of the first graduate quarter. Authorizations for master's programs expire three calendar years from the first graduate quarter. An extension requires review of academic performance by the department.

The specific University residency, unit requirement, and additional policies for a bachelor's/master's program are described under Residency and Unit Requirements in Coterminal Programs in the "Graduate Degrees" section of this bulletin.

Conferral of each degree is applied for separately by the deadlines given in the University Time Schedule. The master's degree must be conferred simultaneously with, or after, the bachelor's degree.

DEGREE REQUIREMENTS

A LIBERAL EDUCATION

As do all major universities, Stanford provides the means for its undergraduates to acquire a liberal education—an education that broadens the student's knowledge and awareness in each of the major areas of human knowledge, that significantly deepens understanding of one or two of these areas, and that prepares him or her for a lifetime of continual learning and application of knowledge to career and personal life.

The undergraduate curriculum at Stanford allows considerable flexibility. It permits each student to plan an individual program of study that takes into account personal educational goals consistent with particular interests, prior experience, and future aims. All programs of study should achieve some balance between depth of knowledge acquired in specialization and breadth of knowledge acquired through exploration. Guidance as to the limits within which that balance ought to be struck is provided by the University's General Education Requirements and by the requirements set for major fields of study.

These educational goals are achieved through study in individual courses that bring together groups of students examining a topic or subject under the supervision of scholars. Courses are assigned credit units. To earn a bachelor's degree, the student must complete at least 180 allowable units and, in so doing, also complete the Writing Requirement, the General Education Requirements, the Language Requirement, and the requirements of a major.

The purpose of the Writing Requirement is to promote effective communication by ensuring that every undergraduate can write clear and effective English prose. Words are the vehicles for thought, and clear thinking requires facility in writing and speech.

The Language Requirement ensures that every student gains a basic familiarity with a foreign language. Foreign language study extends the student's range of knowledge and expression in significant ways, providing access to materials and cultures that otherwise would be out of reach.

The General Education Requirements provide guidance toward the attainment of breadth and stipulate that a significant share of a student's work must lie outside an area of specialization. These requirements ensure that every student is exposed to different ideas and different ways of thinking. They enable the student to approach and to understand the important "ways of knowing" to assess their strengths and limitations, their uniqueness, and, no less important, what they have in common with others.

Depth, the intensive study of one subject or area, is provided through specialization in a major field. The major relates more specifically to a student's personal goals and interests than do the general requirements outlined above. Stanford's curriculum provides a wide range of standard majors through its discipline-oriented departments, a number of interdisciplinary majors in addition to department offerings, and the opportunity for students to design their own major programs.

Elective courses, which are not taken to satisfy requirements, play a special role in tailoring the student's program to individual needs. For most students, such courses form a large portion of the work offered for a degree. Within the limitations of requirements, students may freely choose any course for which previous studies have prepared them.

Following are more detailed descriptions of these various requirements and the rationales upon which they are based.

THE WRITING REQUIREMENT

All instructors expect that students will express themselves effectively in speech and writing. The Writing Requirement helps students meet that expectation.

All candidates for the bachelor's degree, regardless of the date of matriculation, must satisfy the requirement. Transfer students are individually informed at matriculation of their status with regard to the requirement.

The Writing Requirement was revised for undergraduates who entered Stanford in Autumn 1996 and thereafter. In addition to the requirement detailed below for completion of the first-year courses, these students must complete a writing-intensive course in their major. Courses available to fulfill the Writing in the Major Requirement (WIM) are designated under individual department listings. All undergraduates must satisfy the first-year course(s) requirement in one of four ways:

1. English 1-2, a two-quarter sequence of composition courses. (Note: a few students who demonstrate sufficient skill in the first quarter of the English 1-2 sequence will be exempted from English 2 upon certification by the instructor.)
2. English 3, an intensified one-quarter course open only to students with a score of 4 or 5 on the CEEB Advanced Placement Test in English.
3. Special writing instruction in connection with the Area One Requirement.
4. Approved transfer credit.

A complete list of courses is distributed to all entering undergraduates and is also available at the Writing and Critical Thinking office.

Courses available to fulfill the first-year Writing Requirement are designated (W) in this bulletin.

THE GENERAL EDUCATION REQUIREMENTS

PURPOSE

The General Education Requirements are an integral part of undergraduate education at Stanford. Their purpose is two-fold: to introduce students to a broad range of fields and areas of study within the humanities, social sciences, natural sciences, applied sciences, and technology, and to help students prepare to become responsible members of society. Whereas the concentration of courses in the major is expected to provide depth, the General Education Requirements have the complementary purpose of providing breadth to a student's undergraduate program. The requirements are also intended to introduce students to the major social, historical, cultural, and intellectual forces that shape the contemporary world.

Fulfillment of the General Education Requirements in itself does not provide a student with an adequately broad education any more than acquiring the necessary number of units in the major qualifies the student as a specialist in the field. The major and the General Education Requirements are meant to serve as the nucleus around which the student is expected to build a coherent course of study by drawing on the options available among the required and elective courses.

Information regarding specific courses that have been certified to fulfill the General Education Requirements, and regarding a student's status in meeting these requirements, is available at the Office of the Registrar. Course planning and advising questions related to the General Education Requirements should be directed to the Undergraduate Advising Center.

It is the responsibility of each student to ensure that he or she has fulfilled the requirements by checking in Axess within the Undergraduate Progress function or by checking with the Office of the Registrar. This should be done at least two quarters before graduation.

Students should be extremely careful to note which set of General Education Requirements apply to them. The date of matriculation at Stanford determines which requirements apply to an individual student.
CURRENT SYSTEM

To fulfill the General Education Requirements (GER), undergraduates who entered Stanford in Autumn Quarter 1996 and thereafter must complete a minimum of nine courses certified for this purpose in four areas as follows:

**Area 1 Program**—Introduction to the Humanities courses (one-quarter introductory courses followed by two-quarter thematic sequences)

- Students are expected to satisfy the Area One Requirement during their freshman year.

**Area 2: Natural Sciences, Applied Science and Technology, and Mathematics**—Students can fulfill this requirement in two different ways:
  1. By completing one of the integrated three-course Science, Mathematics, and Engineering Core sequences, or
  2. By completing three certified GER courses in this area, with no more than two of these courses from the same subarea.

**Area 3: Humanities and Social Sciences**—Students are required to complete three certified GER courses in this area with at least one course in the humanities subarea and one in the social sciences subarea.

**Area 4: World Cultures, American Cultures, and Gender Studies**—While satisfying requirements for areas 1 or 3, or by taking additional courses, students must complete at least one certified GER course in two of the three subareas.

Courses certified as meeting the General Education Requirements must be taken for a letter grade and a minimum of 3 units of credit. A single course may be certified as fulfilling one subarea within the General Education Requirements; the one exception is that a course may be certified to fulfill an Area 4 subarea in addition to an Area 3 subarea.

Courses that have been certified as meeting the requirements are identified throughout this bulletin with the notational symbols listed below.

A comprehensive list of certified courses also appears as an Appendix to this bulletin.

**Area 1 Program**

- GER 1a: first-quarter course
- GER 1b: second-quarter course
- GER 1c: third-quarter course

**Area 2: Natural Sciences, Applied Science and Technology, and Mathematics**

- GER 2: three-quarter Science, Mathematics, and Engineering core sequence
- GER 2a: Natural Sciences subarea
- GER 2b: Applied Science and Technology subarea
- GER 2c: Mathematics subarea

**Area 3: Humanities and Social Sciences**

- GER 3a: Humanities subarea
- GER 3b: Social Sciences subarea

**Area 4: World Cultures, American Cultures, and Gender Studies**

- GER 4a: World Cultures subarea
- GER 4b: American Cultures subarea
- GER 4c: Gender Studies subarea

**CREDIT TRANSFER**

While courses taken in fulfillment of the General Education Requirements should be taught by Stanford faculty members who are Academic Council members or Senior Lecturers, students may propose that work taken at another college or university be accepted in fulfillment of a General Education Requirement. In such cases, the Office of the Registrar's Credit Evaluation staff determines, after appropriate faculty consultation, whether the work is comparable to any of the specifically certified courses or course sequences.

**UNDERGRADUATES WHO ENTERED PRIOR TO AUTUMN 1996**

Stanford has a long tradition of ensuring curricular breadth through some system of requirements, variously described as "distribution requirements," "general studies requirements," or "general education requirements." A student returning to Stanford to complete an interrupted degree program may satisfy either the distribution program in place at the time of matriculation or the current program of requirements. Such a student should consult the Stanford Bulletin or its predecessors appropriate to the original entrance year or seek the advice of the Undergraduate Degree Coordinator, room 132, Old Union. Students completing requirements in effect 1991 or later may find the Appendix to this bulletin helpful in planning work.

**THE LANGUAGE REQUIREMENT**

To fulfill the Language Requirement, undergraduates who entered Stanford in Autumn 1996 and thereafter are required to complete one year of college-level study or the equivalent in a foreign language. Students may fulfill the requirement in any one of the following ways:

1. Complete three quarters of a first-year language course at Stanford or the equivalent at another recognized post-secondary institution.
2. Score 4 or 5 on the Advanced Placement (AP) test in a language other than English.
3. Achieve a satisfactory score on the SAT II Subject Tests in the following languages:
   - Chinese 630 Italian 630
   - French 640 Japanese 620
   - German 630 Latin 630
   - Hebrew 540 Spanish 630
4. Take a diagnostic test in a particular language which either:
   a) Places them out of the requirement, or
   b) Diagnoses them as needing one, two, or three additional quarters of college-level study. Students fulfilling the requirement can then be permitted either by passing the required number of quarters of college-level language study at Stanford or the equivalent elsewhere, or by retaking the diagnostic test at a later date and placing out of the requirement.

Written placements are offered on-line throughout the summer in Chinese, French, German, Japanese, Russian, Spanish, and Spanish for home background speakers.

**CREDIT**

**ADVANCED PLACEMENT**

Stanford University allows up to 45 units of credit toward graduation for work completed in high school as part of the College Entrance Examination Board (CEEB) Advanced Placement curriculum. The awarding of such credit is based on CEEB Advanced Placement test scores and is subject to University and department approval.

The faculty of a given department determines whether any credit toward the 180-unit requirement can be based on achievement in the CEEB Advanced Placement Program in their discipline. Stanford departments electing to accept the Advanced Placement (AP) credit are bound by these University policies:

1. Credit is usually granted for an AP score of 4 or 5. Usually, 10 quarters are awarded (but occasionally fewer than 10). No more than 10 quarter units may be given for performance in a single examination. If the student has scores of 4 or 5 on two exams within the same language (for example, French Language and Literature), or within the same subject (for example, Music Theory and Music History), the
student is given a maximum total of 10 quarter units based on only one of the scores—the higher of the two, if different. The Studio Art and Art History examinations are treated separately and yield 10 quarter units each for scores of 4 or 5.

2. Whether credit is to be given for an AP score of 3 is a matter for departmental discretion; up to 10 units may be awarded.

3. No credit may be authorized for an AP score lower than 3.

Performance on an AP exam can indicate the appropriate placement for continuing course work in that subject at Stanford. Students may not enroll in courses at Stanford for which they received equivalent credit through the AP program. The chart below shows the current AP credit and placement policies. Further information is available from the Office of the Registrar's Transfer Credit Evaluator, room 141, Old Union.

AP SCORES AND PLACEMENT

<table>
<thead>
<tr>
<th>Test Subject</th>
<th>Score</th>
<th>Placement Quarter</th>
<th>Units of Credit</th>
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</thead>
<tbody>
<tr>
<td>U.S. Government and Politics</td>
<td>4, 5</td>
<td>Not applicable</td>
<td>5</td>
</tr>
<tr>
<td>U.S. History</td>
<td>4, 5</td>
<td>Not applicable</td>
<td>10</td>
</tr>
<tr>
<td>Art History</td>
<td>4, 5</td>
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<tr>
<td>Art (Studio)</td>
<td>4, 5</td>
<td>Not applicable</td>
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<tr>
<td>Biology</td>
<td>4, 5</td>
<td>Not applicable</td>
<td>10</td>
</tr>
<tr>
<td>Chemistry</td>
<td>4, 5</td>
<td>Chem. 32 or above</td>
<td>4</td>
</tr>
<tr>
<td>Comparative Gov. and Politics</td>
<td>4, 5</td>
<td>Not applicable</td>
<td>5</td>
</tr>
<tr>
<td>Computer Science AB</td>
<td>4, 5</td>
<td>CS 106X*</td>
<td>5</td>
</tr>
<tr>
<td>Computer Science A</td>
<td>4, 5</td>
<td>CS 106X*</td>
<td>5</td>
</tr>
<tr>
<td>Macro/Micro</td>
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<td>Economics</td>
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<td>Econ. 501</td>
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<td>English</td>
<td>4, 5</td>
<td>Writ. &amp; Crit. Think. 3</td>
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<td>Environmental Science</td>
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<td>Not applicable</td>
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<td>French</td>
<td>4, 5</td>
<td>Second year and above</td>
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<tr>
<td>German</td>
<td>4, 5</td>
<td>Second year or above</td>
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<td></td>
<td>3</td>
<td>Take placement test</td>
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<td>Latin</td>
<td>4, 5</td>
<td>100 series</td>
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<td>Math. AB</td>
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<td>4</td>
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<td>1, 2, 3</td>
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<td>Music</td>
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<td>Physics B</td>
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<td>Phys. 25, 45, 61 (with strong calculus background)</td>
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<td></td>
<td>4</td>
<td>Physics 23 or 43</td>
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<td></td>
<td>3</td>
<td>Physics 21 or 41</td>
<td>5</td>
</tr>
<tr>
<td>Physics C (2 parts) Mech. only</td>
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<td>Phys. 23, 41, 61 (with strong calculus background)</td>
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<td></td>
<td>3</td>
<td>Physics 23 or 41</td>
<td>4</td>
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<tr>
<td>E&amp;M only</td>
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<td>Phys. 21, 41, 61 (with strong calculus background)</td>
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<td></td>
<td>3</td>
<td>Physics 21 or 41</td>
<td>4</td>
</tr>
<tr>
<td>Both</td>
<td>4, 5</td>
<td>Phys. 25, 47, 61 (with strong calculus background)</td>
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<td></td>
<td>3</td>
<td>Physics 25 or 41</td>
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<td>Psychology</td>
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<td>Psych. 2 or above</td>
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<td>Spanish</td>
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<td>Second year or above</td>
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</tr>
<tr>
<td>Statistics</td>
<td>4, 5</td>
<td>Stat. 61</td>
<td>5</td>
</tr>
</tbody>
</table>

* Students may skip Computer Science 106A, B and X and complete Computer Science 103, 107, or 109 to receive an additional 5 quarter units.

† A minimum score of 4 on both tests will receive 5 units.

ACTIVITY COURSES

For undergraduates who entered Autumn 1996 and thereafter, a maximum of 8 units of credit earned in activity courses, regardless of the offering department or if accepted as transfer units, count towards the 180 (225 if dual degrees are being pursued) units required for the bachelor's degree. All activity courses are offered on a satisfactory/no credit basis.

Undergraduates who entered Stanford between Autumn 1986 and the end of the 1995-96 academic year may apply a maximum of 12 units in activity courses (Physical Education or Music Activity) to the 180/225 unit requirement for graduation.

COURSES TAKEN ON SATISFACTORY/NO CREDIT OR CREDIT/NO CREDIT BASIS

For undergraduates who entered Autumn 1996 and thereafter, a maximum of 36 units of credit taken at Stanford or its overseas campuses for a "CR" or "S" grade may be applied towards the 180 (225 if dual degrees are being pursued) units required for the bachelor's degree. For those who entered Stanford as transfer students in Autumn 1996 and thereafter, the maximum is 27 units.

Departments may also limit the number of satisfactory or credit courses accepted towards the requirements for a major. Satisfactory/credit courses applied towards a minor may be similarly limited. Courses not letter-graded are not accepted in fulfillment of the General Education Requirements applicable to undergraduate students who entered Stanford in Autumn 1996 and thereafter. Writing in the Major courses are usually offered letter grade only. In those instances where the course is offered for a letter grade or CR/NC, the course must be taken for a letter grade.

INTERNSHIP GUIDELINES

Undergraduate internships should not by themselves carry any credit. However, an individual student may arrange with a faculty member for a research or other academic project to be based on the internship. Arrangements between students and faculty regarding credit are expected to be made well in advance of the internship. Credit should be arranged within departmental rules for directed reading or independent study and should meet the usual department standards.

TRANSFER WORK

Academic credit for work done elsewhere will be allowed toward a Stanford bachelor's degree under the following rules and conditions:

1. Credit may be granted for work completed at institutions in the U.S. only if the institutions are accredited.

2. Study in institutions outside the U.S., when validated by examination results, tutorial reports, or other official evidence of satisfactory work, may be credited toward a Stanford bachelor's degree, subject to the approval of the credit evaluator and the appropriate departments.

3. Credit is officially allowed only after the student has been unconditionally admitted to Stanford.

4. Credit is allowed for work completed at institutions in the U.S. only on the basis of an official transcript received by the Registrar at Stanford directly from the institution where the credit was earned.

5. Credit from another institution will be transferred for courses which are substantially equivalent to those offered at Stanford University on the undergraduate level, subject to the approval of the credit evaluator. A maximum of 20 quarter units may represent courses which do not parallel specific courses at Stanford, again, subject to the approval of the credit evaluator as to quality and suitability.

6. The credit allowed at Stanford for one quarter's work may not exceed the number of units that would have been permissible for one quarter if the work had been done at Stanford; for work done under a system other than the quarter system, the permissible maximum units are calculated at an appropriate ratio of equivalence.

7. Credit is allowed at Stanford for work graded 'A', 'B', 'C', or 'Pass', but not for work graded 'D' or below.

8. No more than 90 quarter units of credit for work done elsewhere may be counted toward a bachelor's degree at Stanford.

9. Credit earned in extension and correspondence courses is transferable only if the university offering the courses allows that credit toward its own bachelor's degree. Such credit is limited to a maximum of 45 quarter units for extension courses, a maximum of 15 quarter
units for correspondence study, and a maximum of 45 quarter units for the combination of extension and correspondence courses.

10. Credit earned in military training and service is not transferable to Stanford, unless offered by an accredited college or university in the U.S. and is evaluated as above by the credit evaluator.

CONCURRENT ENROLLMENT

Students may enroll concurrently at Stanford and at another college or university. The following policies apply to Concurrent Enrollment:

1. Students may not exceed 20 units between both schools. This is the same unit maximum for undergraduate students at Stanford.
2. Satisfactory academic progress is determined only by Stanford courses and units. Transfer work completed at other institutions is not considered in this calculation.
3. Students are expected to consult with the Transfer Credit Evaluator (Old Union, room 141) if planning to transfer the work back to Stanford. Consultations should be completed prior to enrolling in the transfer institution.

THE MAJOR

The primary purpose of the major is to encourage each student to explore a subject area in considerable depth. This in-depth study complements the breadth of study promoted by the General Education Requirements and, in many cases, by a student's choice of electives. Work in depth permits practice in critical analysis and the solving of problems. Because of its depth, such study also provides a sense of how knowledge grows and is shaped by time and circumstances.

The structure of a major should be a coherent reflection of the logic of the discipline it represents. Ideally, the student should be introduced to the subject area through a course providing a general overview, and upper-division courses should build upon lower-division courses. The course of study should, if feasible, give the student the opportunity and responsibility of doing original, creative work in the major subject. Benefits of the major program are greatest when it includes a culminating and synthesizing experience such as a senior seminar, an undergraduate thesis, or a senior project.

REQUIREMENTS

Undergraduates must select a major by the time they achieve junior status (85 units completed). All undergraduate major programs listed in this bulletin, except for certain honors degree programs that require application and admission in advance, are open to all students. Students may use Axess to declare, drop or exchange a major at any time. In some departments or programs, though, a late change could easily result in extending the period of undergraduate study. Students who have applied to graduate, wish to declare an individually-designed major or pursue a dual A.B./B.S. degree, and coterm students must use printed forms to select or change a major. Students requiring assistance should contact the Registrar’s Degree Progress Office, Old Union, room 132.

Check individual department or program listings in this bulletin for the undergraduate degrees offered and for specific major requirements. If an area of study has no baccalaureate degree, that discipline is not available as a regular undergraduate major.

Faculty set the minimum requirements for the major in each department. These requirements usually allow latitude for tailoring a major program to a student's specific educational goals. The responsibility for developing a major program within department or program requirements lies ultimately with the individual student working in consultation with the major adviser.

MULTIPLE MAJORS

Although most students declare only one major, a student may formally declare more than one major within a single bachelor's degree (A.B., B.S., or B.A.S.) program. The student may do that either at the time of initial major declaration or, as may be more advisable given the plan-ning required to complete more than one major, by amending the original declaration. The student’s major departments or programs will have access routinely to all information pertinent to that student's academic record (for example, course and grade information), and each is expected to provide advising and other assistance. Students may pick up appropriate information regarding major declarations from the Registrar's Office. To be awarded a bachelor’s degree with multiple majors, the student must fulfill the following requirements:

1. Formally declare all majors to the Registrar's Office.
2. Satisfy the requirements of each major without applying any course towards the requirements of more than one major or any minor unless a) overlapping courses constitute introductory skill requirements (for example, introductory math or a foreign language) b) overlapping courses enable the student to meet school requirements (for example, for two majors within the School of Engineering). Currently, only the School of Engineering has school requirements for its undergraduate majors.

Students pursuing multiple majors must complete a multiple major program sheet indicating which courses they plan to apply toward each major and any minor(s). Departments must certify that the plan of study meets all requirements for the majors and any minor(s) without unallowable overlaps in course work. To facilitate advance planning, multiple major program sheets are available at any time in the Degree Progress Office, room 132, Old Union.

When students cannot meet the requirements of multiple majors without overlaps, the secondary major, outlined below, may be relevant.

SECONDARY MAJOR

In some cases, students may complete course requirements for more than one major, but they may not meet the requirements outlined for the multiple major option. For example, the student may develop a course plan in which courses requisite for one major overlap with requirements for another. In these cases, the student may declare a secondary major which will result in the transcript bearing an annotation that the course requirements for that major have also been met.

LIMITS OF THE MAJOR

In order to achieve the values of study in depth, a well-structured major should constitute approximately one-third of a student’s program (55-65 units). To ensure the values of breadth, a major should comprise no more than two-thirds of a student’s program (115-125 units). And, to avoid intellectual parochialism, a major program should not require a student to take more than about one-third of his or her courses from within a single department.

Major requirements in cognate subjects essential to the structure of a given major should be counted as part of the major program in applying these guidelines. Department or school requirements designed to provide extra disciplinary breadth should not be counted.

For a limited number of qualified students, many departments and programs offer special programs leading to degrees with honors. A student may apply to the major department or program for acceptance into the honors program. Demands on the student may vary, but all honors programs encourage creative, independent work at an advanced level in addition to the major requirements.

The guidelines set forth here are deliberately general; implementation must take into account the specific needs of a student’s program and the nature of the discipline or disciplines involved. The exercise of responsibility in achieving the desired educational balance belongs first with the student, who, after all, has the strongest interest in the value of his or her education. It belongs secondarily to departments and major programs, which must set the requirements of competence in the many majors offered.
## UNDERGRADUATE MAJOR UNIT REQUIREMENTS

<table>
<thead>
<tr>
<th>Major Department</th>
<th>Units required outside the dept/program</th>
<th>Units required within the dept/program</th>
<th>Total # of units</th>
<th>Notes/Special Requirements</th>
<th>WIM Course</th>
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<tr>
<td>Earth Systems</td>
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<td>109-125</td>
<td>Internship/Senior Seminar</td>
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<td>Geological &amp; Environmental Sciences</td>
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<td>Geological Sciences</td>
<td>39-42</td>
<td>41-56</td>
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<td>152,185,190</td>
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<td>45-46</td>
<td>46-59</td>
<td>min. 91</td>
<td></td>
<td></td>
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<tr>
<td>Engr.Geol. &amp; Hydrogeology</td>
<td>40</td>
<td>56-61</td>
<td>min. 96</td>
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<td>Petroleum Engineering</td>
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<td>39-40</td>
<td>111-112</td>
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<td>PE 180</td>
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<tr>
<td><strong>School of Engineering</strong></td>
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<td>E 102M, ME 103</td>
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<td>Chemical Engineering</td>
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<td>51-52</td>
<td>130-136</td>
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<td>50-53</td>
<td>110-116</td>
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<td>95-103</td>
<td>Senior Project</td>
<td>CS 191W,194,201</td>
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<td>58-61</td>
<td>102-104</td>
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<td>40</td>
<td>90-107</td>
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<td>35-63</td>
<td>109-124</td>
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<td>MS&amp;E 152,164,193,197</td>
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<td>Material Science and Engineering</td>
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<td>Mechanical Engineering</td>
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<td>47-49</td>
<td>114-119</td>
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<td>Engr.102M and ME 103</td>
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<td>Product Design</td>
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<td>31</td>
<td>103-105</td>
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<td>Engr. 102M</td>
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<td>approx. 70</td>
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<td>Art</td>
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<tr>
<td>History</td>
<td>—</td>
<td>50</td>
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<td>library orientation</td>
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<tr>
<td>Studio</td>
<td>—</td>
<td>65</td>
<td>65</td>
<td>library orientation</td>
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<td>Asian American Studies</td>
<td>10-60</td>
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<td>Asian Languages</td>
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<tr>
<td>Chinese</td>
<td>0-16</td>
<td>27-43</td>
<td>min. 43</td>
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<td>Japanese</td>
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<td>23-43</td>
<td>min. 43</td>
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<td>Biological Sciences</td>
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<td>74-76</td>
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<td>Bio. 44X,44Y,145/245</td>
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<td>Classics</td>
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<td>Comm. 141A,141B</td>
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<td>Comparative Studies in Race &amp; Ethnicity</td>
<td>10-60</td>
<td>—</td>
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<td>CSRE 200X</td>
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<td>Cultural and Social Anthropology</td>
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<td>40</td>
<td>65</td>
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<tr>
<td>Drama</td>
<td>—</td>
<td>58</td>
<td>58</td>
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<td>Drama 161,162,163</td>
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<td>Major Department</td>
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<td>Units required within the dept/program</td>
<td>Total # of units</td>
<td>Notes/Special Requirements</td>
<td>WIM Course</td>
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<tr>
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<tr>
<td>East Asian Studies</td>
<td>75</td>
<td>—</td>
<td>75</td>
<td>senior essay, seminar</td>
<td>Chinese 133; Japanese 138; Pol. Sci. 29/129,115B</td>
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<td>Economics</td>
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<td>75-77</td>
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<td>Econ. 101</td>
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<td>English w/ Creative Writing</td>
<td>55</td>
<td>65</td>
<td>65</td>
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<td>English w/ Interdisciplinary Emphasis</td>
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<td>75</td>
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<td>Feminist Studies</td>
<td>45</td>
<td>15 core</td>
<td>60</td>
<td>FS 104</td>
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<tr>
<td>French and Italian</td>
<td>max. 24</td>
<td>32 above #100</td>
<td>55-63 above #100</td>
<td>unit requir. vary by concentration</td>
<td>Pr. 123,261, 263A and 263B</td>
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<td>French and English Literatures</td>
<td>max. 24</td>
<td>32 above #100</td>
<td>55-63 above #100</td>
<td>4 Eng. Lit. courses</td>
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<tr>
<td>French and Italian Literatures</td>
<td>max. 24</td>
<td>32 above #100</td>
<td>55-63 above #100</td>
<td>4 Ital. Lit. courses</td>
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<td>Italian</td>
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<td>60 above #100</td>
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<td>32 above #100</td>
<td>60 above #100</td>
<td>4 Eng. Lit. courses</td>
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<tr>
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<td>32 above #100</td>
<td>60 above #100</td>
<td>4 Fr. Lit. courses</td>
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<td>German Studies</td>
<td>0-25</td>
<td>35-60</td>
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<td>3 above #130 GS 123N,126Q,167N,128</td>
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<tr>
<td>Human Biology</td>
<td>min. 13</td>
<td>min. 43</td>
<td>87</td>
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<td>Interdisciplinary Studies in Humanities</td>
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<tr>
<td>Option I</td>
<td>approx. 60</td>
<td>27 (honors)</td>
<td>approx. 87</td>
<td>Honors only major. + 5 qtrs. language</td>
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<tr>
<td>Option II</td>
<td>approx. 110</td>
<td>27 (honors)</td>
<td>approx. 137</td>
<td>Honors only major;</td>
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<td>International Relations</td>
<td>55-65</td>
<td>0-10</td>
<td>65</td>
<td>2 yr. foreign lang.; Overseas studies 1 qtr. IR 199T,215, Pol. Sci. 115B,134B</td>
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<tr>
<td>Jewish Studies (Individually Designed)</td>
<td>60-62</td>
<td>—</td>
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<td>See CSRE</td>
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<td>Latin American Studies</td>
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<td>Linguistics</td>
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<td>50</td>
<td>50</td>
<td>foreign lang. @ 6th quarter level</td>
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<td>Mathematical &amp; Computational Science</td>
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<td>76-80</td>
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<td>See Mathematics</td>
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<td>Mathematics</td>
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<td>Math. 109,110,120,171</td>
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<td>Music, Science, &amp; Technology</td>
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<td>62-72</td>
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<td>Native American Studies</td>
<td>10-60</td>
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<td>Philosophy</td>
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<td>55</td>
<td>course in 194 series</td>
<td>Phil. 80</td>
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<td>Philosophy and Religious Studies</td>
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<td>60</td>
<td>3 seminars; 20 units in each dept. + 20 advanced units fr. both depts.</td>
<td>Phil. 80 or RS 290</td>
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<td>72</td>
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<td>Political Science</td>
<td>0-10</td>
<td>50-60</td>
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<td>PS 28,29,104,115B,119M, 134B,137F,143F,199B,268</td>
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<td>Psychology</td>
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<td>Psych. 50,60,70,110,161</td>
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<td>Public Policy</td>
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<td>28</td>
<td>83</td>
<td>15 in concentration, Senior Seminar</td>
<td>Pub. Pol. 104</td>
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Notes/Special Requirements:
- Major Department Units required outside the dept/program
- Units required within the dept/program
- Total # of units
- Notes/Special Requirements
- WIM Course
<table>
<thead>
<tr>
<th>Major Department</th>
<th>Units required outside the dept/program</th>
<th>Units required within the dept/program</th>
<th>Total # of units</th>
<th>Notes/Special Requirements</th>
<th>WIM Course</th>
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<tr>
<td>Religious Studies</td>
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<td>3 seminars; 25 units in concentration</td>
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<td>A.B.</td>
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<td>B.S.</td>
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<td>32</td>
<td>82</td>
<td>30 in technical depth</td>
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<td>Slavic Languages and Literatures</td>
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<td>Russian Language and Literature</td>
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<td>52</td>
<td>1st- and 2nd- year Russian</td>
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<td>35-39</td>
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<td>60</td>
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<td>Soc. 200</td>
</tr>
<tr>
<td>Spanish &amp; Portuguese</td>
<td></td>
<td>20-25</td>
<td>50</td>
<td></td>
<td>Span. 102.298</td>
</tr>
<tr>
<td>Symbolic Systems</td>
<td>71</td>
<td>2</td>
<td>73</td>
<td></td>
<td>Phil. 80</td>
</tr>
<tr>
<td>Urban Studies</td>
<td>59</td>
<td>11</td>
<td>70</td>
<td></td>
<td>Urbs 120/Art 254</td>
</tr>
</tbody>
</table>

MINORS, HONORS, ACADEMIC STANDING, AND ADVISING

THE UNDERGRADUATE MINOR

Students completing a bachelor’s degree may elect to complete one or more minors in addition to the major. Minors must be officially declared by students no later than the deadline for their applications to graduate, according to declaration procedures developed and monitored by the Registrar. Earlier deadlines for declaration of the minor may be set by the offering school or department. Satisfactory completion of declared minors is noted on the students’ transcripts after degree conferral.

A minor is a coherent program of study defined by the department or degree program. It may be a limited version of a major concentration or a specialized subset of a field. A minor consists of no fewer than six courses of 3 or more units to a maximum of 36 units of letter-graded work, except where letter grades are not offered. Departments and degree programs establish the structure and requirements of each minor in accordance with the policy above and within specific guidelines developed by the deans of schools. Programs which do not offer undergraduate degrees may also make proposals to their cognizant deans to establish a minor. Requirements for each minor are described in the individual department or program listings in this bulletin.

Students may not overlap (“double-count”) courses for completing major and minor requirements, unless:

1. Overlapping courses constitute introductory skill requirements (for example, introductory math or a foreign language), or

2. Overlapping courses enable the student to meet school requirements (for example, for a major within the School of Engineering and a minor). Currently, only the School of Engineering has school requirements for its undergraduate majors.

Undergraduate students use Axess to declare or drop a minor. Students with questions about declaring minors or double-counting courses towards combinations of majors and/or minors should consult with the departments or programs involved or the Registrar’s Degree Progress Office, room 132, Old Union.

BACCALAUREATE HONORS

With Distinction—In recognition of high scholastic attainment, the University, upon recommendation of a major department or program, awards the Bachelor’s Degree with Distinction to approximately 15 percent of the graduating class. Students are also urged to consider the departmental honors programs that may give depth to their major study and to consider, as well, how the interdisciplinary honors programs might contribute to the quality of their undergraduate education.

Departmental Honors Programs—In recognition of successful completion of special advanced work, departments in more than 30 fields of study may recommend their students for honors. Departmental honors programs demand independent creative work at an advanced level in addition to the major requirements.

Interdisciplinary Honors Programs—In recognition of successful completion of honors program requirements, the following interdisciplinary programs can recommend students majoring in any field for honors in their program:

Education
Environmental Science, Technology, and Policy
Ethics in Society
Feminist Studies
Humanities
Jewish Studies
Latin American Studies (a new honors program is being considered)
Science, Technology, and Society

The interdisciplinary honors programs are designed to complement study in a department major. The requirements for these honors programs are described in the department sections of this bulletin.

Foreign Language Proficiency—The notation “proficiency in (language)” appears on the official transcripts of those students whose levels of achievement are found by procedures established by the language department to be roughly equivalent to knowledge an excellent student can be expected to demonstrate late in the third quarter of the third year of study in that language.

ACADEMIC STANDING

Undergraduates matriculating in Autumn Quarter 1999, and thereafter, are required to adhere to the academic standards described below. The standards include maintaining a minimum 2.0 cumulative GPA and a quantitative unit requirement for good academic standing. In addition, a minimum 2.0 cumulative GPA is required for a baccalaureate degree.

Undergraduates matriculating prior to Autumn 1999 are required to adhere to the academic standards described below but are exempt from the minimum 2.0 cumulative GPA requirement for academic standing purposes. However, departments can elect to require a minimum GPA for course work applicable to the major and the minor. Refer to departmental literature for specific requirements.

Undergraduate students normally are expected to plan their academic programs so that they can complete 180 units in four years (twelve
In addition, students are expected to maintain an overall grade point average of at least 2.0. Transfer work completed at other institutions is not considered in this calculation. A student earning fewer than 9 units per quarter or fewer than 36 units in three quarters, or earning less than a 2.0 cumulative grade point average, is placed on probation. Students on probation or provisional registration status (see definitions below) are required to earn a minimum of 12 units per quarter, by the end of the final quarter examination period for three consecutive quarters, and maintain a cumulative grade point average of at least 2.0 to attain good academic standing. A Stanford Summer Session Quarter counts toward the three consecutive quarter requirement if 11 or more units are completed. The faculty Subcommittee on Academic Standing may stipulate otherwise by acting upon a petition for fewer units.

Full-time enrollment is considered to be enrollment in a minimum of 12 units of course work per quarter at Stanford. Under extenuating circumstances, students may petition to the faculty Subcommittee on Academic Standing to take fewer units. Work necessary to complete units from previous quarters does not count toward the 12 units necessary for full-time enrollment in the current quarter. All students registering for fewer than 12 units should consider the effects of that registration on their degree progress, visas, deferments of student loans, residency requirements, and their eligibility for financial aid and awards.

All undergraduate students validly registered at Stanford are considered to be in good standing for the purposes of enrollment certification and athletic participation.

Units are granted for courses completed with grades 'A,' 'B,' 'C,' 'D,' 'Satisfactory' ('CR' or 'S'), and 'L.' Courses graded 'N' are counted provisionally as units completed, provided the student enrolls in the continuing segment of that course the following quarter. When the course is completed, the student receives the units for which he or she enrolled. No units are granted for a course in which the student receives an 'F' or an 'I' until the course is completed satisfactorily and the final grade reported. (See "Grading Systems" below.)

PROBATION

A student who fails to complete at least 36 units of work in his or her most recent three quarters of enrollment at the University, or who fails to complete by the end of the final examination period at least 9 quarter units of work in his or her most recent quarter of enrollment at the University, or who has a cumulative grade point average of less than 2.0, shall be placed on probation (warning status).

A student shall be removed from probation after three subsequent quarters of enrollment at the University if, in each quarter, he or she completes a minimum of 12 units of new course work by the end of the final examination period and maintains a cumulative grade point average of at least 2.0. A student may also be removed from probation at the discretion of the subcommittee as a result of a review of individual records.

PROVISIONAL REGISTRATION

A student who, while on probation, fails in any quarter of registration to complete a minimum of 12 units of new course work by the end of the final examination period or fails to achieve a cumulative grade point average of at least 2.0, shall be placed on provisional registration status. Provisional registration requires that a student submit a properly endorsed request to return to Stanford.

A student shall be removed from provisional registration after three subsequent quarters of enrollment at the University if, in each quarter, he or she completes a minimum of 12 units of new course work by the end of the final examination period and maintains a cumulative grade point average of at least 2.0. A student may also be removed from provisional registration at the discretion of the subcommittee as a result of a review of individual records.

SUSPENSION

A student who fails to complete a minimum of 12 units of new course work by the end of the final examination period in any quarter of provisional registration, or who fails to maintain a cumulative grade point average of at least 2.0 while on provisional registration, shall be suspended. In addition, and on occasion, a student may also be suspended directly from probation.

In general, students suspended for the first time are suspended for one year. Students suspended a subsequent time are suspended for three years.

Students suspended for one year are not eligible to enroll for four quarters (including Summer Quarter) following the quarter in which the suspension was issued. Students suspended for three years are not eligible to enroll for twelve quarters (including Summer Quarter) following the quarter in which the suspension was issued. Students are required to submit a properly endorsed petition for provisional registration to request reenrollment after the suspension period has been completed.

Return from Suspension—Students who have been suspended are required to petition for provisional registration to return after their suspension has been completed. Students are strongly encouraged to submit their petition for provisional registration at least three months prior to the desired quarter of return, but no later than the first week of the desired quarter of return.

Appeal of Suspension—Students who have been suspended, and who believe they have a compelling reason to appeal their suspension, with or without a break in enrollment, are required to submit a petition for provisional registration. See "Petition Deadlines" for deadline dates to submit petitions for provisional registration to appeal a suspension.

Early Return from Suspension—Students who have been suspended and who believe they have a compelling reason to return early from their suspension are required to submit a petition for provisional registration. See "Petition Deadlines" for deadline dates to submit petitions for provisional registration to return early from suspension.

PETITIONING

Specific instructions for requesting provisional registration or an early return from suspension should be obtained from the Registrar's Academic Standing Office, Old Union, room 141. The faculty Subcommittee on Academic Standing, or those designated by the subcommittee, shall act upon all requests concerning academic standing, including requests for provisional registration. Questions concerning academic standing or the petitioning process should be directed to the Academic Standing Office.

Late petitions to return from suspension, appeal a suspension, or return early from suspension will not be considered. Students are strongly encouraged to submit petitions as early as possible.

Students applying for financial aid and/or on-campus housing should be aware of the deadlines and procedures for those offices.

PETITION DEADLINES

<table>
<thead>
<tr>
<th>Requested Quarter of Return</th>
<th>Deadline to Submit a Petition to Appeal a Suspension</th>
<th>Deadline to Submit a Petition to Return Early from Suspension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter 2001</td>
<td>January 12, 2001</td>
<td>December 1, 2000</td>
</tr>
<tr>
<td>Spring 2001</td>
<td>April 6, 2001</td>
<td>March 2, 2001</td>
</tr>
<tr>
<td>Spring 2002</td>
<td>April 5, 2002</td>
<td>March 1, 2002</td>
</tr>
<tr>
<td>Autumn 2002</td>
<td>July 26, 2002</td>
<td>July 26, 2002</td>
</tr>
</tbody>
</table>

Contact the Academic Standing Office for future deadline dates.

NOTIFICATION

Written notification that a student is on probation, provisional registration, or suspension is sent to the student and to the student's academic adviser as soon as possible after the close of the quarter. Students also receive written notification of the outcome of their provisional registration petition.
UNDERGRADUATE ACADEMIC ADVISING

The Undergraduate Advising Center (UAC) partners with faculty and staff to address students’ intellectual and developmental goals. The staff coordinates a comprehensive array of programs and advising services designed to support and enhance the undergraduate curriculum. For example, the UAC coordinates the Freshman Advising, Resources, and Mentoring (FARM) program through which freshmen make connections with students, faculty, and staff who share their interests. The Partners for Academic Excellence (PAE) program is another example of a mentoring program designed to increase participants’ connection to and involvement in the academic and social networks of the campus.

Freshmen are assigned to general academic advisers according to their residence and their preliminary academic interest. Freshman advisers work with advisees each quarter to plan their academic programs; advisers must provide an approval code for the on-line filing of study lists through Axess for each quarter of the students’ freshman year.

Sophomores who are undecided about their majors continue to work with the advisers they had as freshmen, and to seek out their advisers’ guidance and approval code. By the time they achieve junior status, undergraduates must declare a major, at which time they are assigned to an adviser from the faculty of the major department or program.

The UAC’s staff of professional advisers, located on the first floor of Sweet Hall, provides advising to all students, freshmen through seniors. The UAC staff offers students help when the official adviser is unavailable or when additional advice is needed; assistance with curriculum planning, including four-year plans; help with choosing a major; information on designing an individually designed major; academic and personal counseling related to academic performance; advice regarding plans to attend graduate or preprofessional school; peer tutoring; and learning skills classes, counseling, and workshops. Reference guides to graduate and professional schools are available. For detailed information, see the UAC web site at http://uac-server.stanford.edu/ or request a copy of the UAC brochure.
Graduate Degrees

GENERAL REQUIREMENTS

For each Stanford advanced degree, there is an approved course of study which meets University and department requirements. The University's general requirements, applicable to all graduate degrees at Stanford, are described below. University requirements pertaining to only a subset of advanced degrees are described in the "Degree-Specific Requirements" section.

See the "Graduate Programs" section of each department's listing for specific department degree requirements. Information on professional school programs is available in the bulletins of the Graduate School of Business, the School of Law, and the School of Medicine.

REGISTRATION REQUIREMENTS

Graduate students must register for all terms of each academic year (Autumn, Winter, and Spring quarters or, for Law students, Autumn and Spring semesters), from the admission term until conferral of the degree. The only exception to this requirement occurs when the student is granted an official leave of absence. Failure to register for a term during the academic year without taking a leave of absence results in denial of further registration until reinstatement to the degree program is granted and the reinstatement fee paid. Registration in Summer Quarter is not required and does not substitute for registration during the academic year.

In addition to the above requirement for continuous registration during the academic year, graduate students are required by the University to be registered:

1. In each term during which any official department or University requirement is fulfilled, including qualifying exams or the University oral exam.
2. In any term in which a University dissertation/thesis is submitted or at the end of which a graduate degree is conferred, unless the student was registered the prior term.
3. Normally, in any term in which the student receives financial support from the University.
4. In any term for which the student needs to use University facilities, such as on-campus housing, libraries, Cowell Health Service, and so on.
5. For international students, in any term of the academic year for which they have non-immigrant status (for example, a J1 or F1 visa).

Individual students may also find themselves subject to the registration requirements of other agencies (for example, external funding sources such as Federal financial aid). Course work and research are expected to be done on campus unless the department gives prior approval for study in absentia and a petition for in absentia registration is approved by the Registrar's Office.

LEAVES OF ABSENCE

Graduate students who do not meet the requirement for continuous registration during the academic year must obtain an approved leave of absence, in advance, for the term(s) they will not be registered. The leave of absence must be reviewed for approval by the chair or director of graduate studies of the student's major department and, if the student is in the United States on a visa, by the Bechtel International Center. The granting of a leave of absence is at the discretion of the department.

New graduate students and approved coterminals may not take a leave of absence during their first quarter. Coterminal students are required to register their first graduate quarter. However, new Stanford students may request a deferment.

Leaves of absence are granted for a maximum of one calendar year. Leaves requested for a longer period are approved only in exceptional circumstances (for example, mandatory military service). An extension of leave (a maximum of one year) for students in master's programs or for doctoral students not yet admitted to candidacy, is approved only in unusual circumstances. Extension requests must be made before the expiration of the original leave of absence. Leaves of absence may not exceed a cumulative total of two years.

Students on leave of absence are not registered at Stanford and, therefore, do not have the rights and privileges of registered students. They cannot fulfill any official department or University requirements during the leave period.

Students on leave may complete course work for which an Incomplete grade was awarded in a prior term and are expected to comply with the usual one-year time limit for resolving incompletes.

REINSTATEMENT

Students who fail to be either registered or approved for a leave of absence by the start of a term are required to apply for reinstatement through the Graduate Admissions Office before they can return to the same degree program. The decision to approve or deny reinstatement is made by the student's department or program. Departments are not obliged to approve reinstatements of students. Reinstatement decisions may be based on the applicant's academic status when last enrolled, activities while away from campus, the length of the absence, the perceived potential for successful completion of the program, and the ability of the department to support the student both academically and financially, as well as any other factors or considerations regarded as relevant by the department.

Reinstatement information is available from the Graduate Admissions Office. A fee is required. Reinstatement applications must be submitted by the first day of the term for which reenrollment is requested if the student is registering for courses.

RESIDENCY

At Stanford, as at other research universities, each advanced degree program has a residency requirement of a minimum number of full-tuition quarters of registration or the equivalent in partial-tuition quarters. Where more than one advanced degree is pursued, the residency requirement may be unique to that particular combination of degrees.

The residency requirements for most degrees and degree combinations are listed in the chart below. Residency measures tuition assessments; the number of course units attempted or completed has no bearing on residency. It should also be noted that the residency requirement represents the minimum tuition requirement for a degree; an individual student, depending on his or her program, preparation, and choices, may need to accrue more residency than the requirement states to earn the degree.

The fundamental reason for this requirement is educational: the minimum residency fixed for each program is the shortest period that students generally need to attain the level of expertise that a particular Stanford advanced degree signifies, by completing specified course work and other degree requirements, and by immersing themselves in the intellectual life of the University.

The residency requirement also ensures that a reasonable proportion of the University's expenses for providing the requisites of a high-quality education are met from tuition income, particularly the expense of small classes and the need for state-of-the-art laboratory facilities and comprehensive library collections. These expenses remain constant even if, as sometimes happens, a student satisfies his or her other degree requirements before completing the residency requirement.

In such cases, the student can receive the degree early but must pay tuition for the full residency period. A tuition deficiency (a percent of residency less than the required number of quarters) for a degree may be paid to obtain the degree or to qualify for Terminal Graduate Registration (TGR) status.

Residency is stated in terms of full-tuition quarters. Registration at the full-tuition rate (11 or more units during the academic year and 15 units during Summer Quarter) earns one quarter of residency. Residency for partial tuition quarters during the academic year accrues as follows:

- 3 units = .24
- 4 units = .31
- 5 units = .37
- 6 units = .43
- 7 units = .50
- 8 units = .56
- 9 units = .62
- 10 units = .68

- 11 units = .74
- 12 units = .80
- 13 units = .86
- 14 units = .92
- 15 units = 1.00

...
Residency is most commonly accrued through registration at Stanford as a matriculated graduate student. Within applicable policy, it may also be earned through graduate work done elsewhere (see below), registration as a non-matriculated student at Stanford, or payment of a tuition deficiency.

Further information about the residency requirement is available from the Degree Progress Office in the Old Union.

RESEIDENCY AND UNIT REQUIREMENTS IN COTERMINAL PROGRAMS

Unit Requirement—The University minimum requirements for coterminal bachelor's/master's program are 180 units for the bachelor's degree plus 36 (or higher departmental requirement, as determined by each graduate department) unduplicated units for the master's degree. The requirements for the coterminal program with dual undergraduate degrees are 180 units for the first bachelor's degree, 45 units for the second bachelor's degree, 36 to 45 units for the master's degree. Of the 36-unit University minimum for the master's degree, all courses must be at or above the 100 level and 50 percent must be courses designated primarily for graduate students (typically at least at the 200 level). Department requirements may be higher. Units for a given course may not be counted to meet the requirements of more than one degree, that is, no units may be double-counted. No courses taken more than two quarters prior to admission to the coterminal master's program may be used to meet the 36-unit University minimum requirement for the master's degree.

Residency Requirement—All Stanford master's degree students are required to complete a residency requirement.

The residency requirement for a student pursuing an A.B., B.S., or B.A.S., and a coterminal master's degree can be fulfilled by completing three full-tuition quarters (or the equivalent in partial-tuition quarters) after reaching 180 units (90 units completed at Stanford). For example, the student who has 180 units at the end of a Autumn Quarter, will begin to accrue graduate residency during the Winter Quarter. If the student has 179 units at the end of Autumn Quarter, graduate residency will not accrue during the Winter Quarter as the 180 unit minimum had not been reached during Autumn Quarter. Advanced Placement and undergraduate transfer units on the student's transcript assist the student in reaching the 180-unit milestone sooner, but cannot be counted towards the three required quarters thereafter.

The residency requirement for a student pursuing dual degrees (an A.B. and a B.S.) and a coterminal master's degree can be fulfilled by completing three full-tuition quarters (or the equivalent in partial-tuition quarters) after reaching 225 units (135 units completed at Stanford). This higher requirement follows the same rules as described in the above paragraph, except the student will begin to accrue graduate residency the quarter after reaching the 225-units milestone.

A full-tuition quarter is registration at the full-tuition rate (11 or more units during the regular academic year and 15 or more units during the Summer Quarter). A partial tuition quarter is registration below the full-tuition rate. For example, students who register for 9 units during an academic quarter accrue 62 percent (0.62) of one full-tuition quarter (see residency for partial tuition quarters as those described above).

Tuition Rate for Graduate Engineering—The tuition rate for graduate Engineering is higher than for undergraduate programs. Students enrolled in a coterminal program in the School of Engineering need to earn three quarters for graduate residency, as do other master's degree students. They begin to pay the higher graduate Engineering tuition rate in the quarter after they have reached 180 units and after they have been enrolled for twelve quarters as undergraduates, at the 11 or more unit rate during the regular academic year (or the 15 or more unit rate during the summer quarters). In effect, undergraduate students are allotted twelve quarters of undergraduate tuition. For example, a student in a coterminal program in the School of Engineering who earned 180 units by the end of the eleventh quarter of enrollment, would begin to accrue graduate residency during the twelfth quarter, but would only start to pay the graduate Engineering tuition rate during the thirteenth quarter of enrollment.

Coterminal students in the School of Engineering, with two undergraduate degrees, are assessed the graduate Engineering tuition rate in the quarter after they have reached 225 units and after they have been enrolled for fifteen quarters as undergraduates, at the 11 or more unit rate during the regular academic year (or the 15 or more unit rate during the summer quarters).

Engineering coterminal students would also start paying the graduate Engineering tuition rate if any undergraduate degree is conferred or if they are granted any graduate aid. Once charged under the graduate Engineering tuition schedule, the tuition will not revert thereafter to the undergraduate rate.

For additional information on the coterminal bachelor's/master program, see Coterminal Bachelor's and Master's Degrees in the "Undergraduate Degrees" section of this bulletin.

RESIDENCY CREDIT FOR GRADUATE WORK DONE ELSEWHERE

After at least one quarter of enrollment, students pursuing an Engineer, Ed.S., D.M.A., Ed.D., or Ph.D. may apply for residency credit for graduate work done at another institution. Engineer or Ed.S. candidates who also earned their master's at Stanford are not eligible for transfer residency credit, nor are any master's degree students. The chart below shows the maximum number of transfer quarters that will be accepted towards Stanford's residency requirement for each degree or degree combination. Regardless of whether transfer residency credit is approved, transfer courses may be used to fulfill department course requirements at the department's discretion, but cannot be applied to Stanford's minimum unit requirement for the degree.

Students enrolled at Stanford who are going to study elsewhere during their degree program should obtain prior approval of any transfer residency sought before their departure.

The following criteria are used by the department in determining whether, in its discretion, it will award transfer residency credit for graduate-level work done at another institution:

1. Courses should have comparable Stanford counterparts that are approved by the student's department. A maximum of 12 units of courses with no Stanford counterparts and/or research units may be granted transfer residency credit.
2. The student must have been registered in a student category which yields graduate credit. The maximum amount of credit given for extension and non-matriculated (non-degree) courses is one quarter. No transfer credit is given for correspondence work.
3. Courses must have been taken after the conferral of the bachelor's degree. The only exception is for work taken through programs structured like the Stanford coterminal bachelor's/master's program.
4. Courses must have a grade point average (GPA) of 'B' (3.0) or better. Pass grades are accepted only for courses for which letter grades were not an option and for which the standard of passing is 'B' quality work.
5. Courses must have been taken at a nationally accredited institution in the U.S. or at an officially recognized institution in a foreign country. Courses taken at foreign universities must be at the level of study comparable to a U.S. graduate program.

The Application for Residency Credit for Graduate Work Done Elsewhere is reviewed by the department and the Degree Progress Office.

RESIDENCY AND MINIMUM UNITS REQUIREMENTS

<table>
<thead>
<tr>
<th>Degree</th>
<th>Min. # of Units</th>
<th>Min. # of Full-Tuition Qtrs. (Residency)</th>
<th>Max. Allowable Transfer Residency Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.M.</td>
<td>36-45</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>M.S./M.A.T.</td>
<td>(see note 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.M./M.S. in Coterminal Program</td>
<td>36-45 (see note 1)</td>
<td>see note 2</td>
<td>0</td>
</tr>
<tr>
<td>A.M./M.S. plus A.M./M.S.</td>
<td>36-45 unduplicated units beyond first A.M./M.S.</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Degree</td>
<td>Units Required</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>----------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>M.F.A.</td>
<td>48-54 units</td>
<td>3 semesters</td>
<td></td>
</tr>
<tr>
<td>Engineer</td>
<td>36-45 unduplicated units beyond A.M./M.S.</td>
<td>3 semesters, 0 if A.M./M.S. completed at Stanford</td>
<td></td>
</tr>
<tr>
<td>Ed.S.</td>
<td>45 unduplicated units beyond A.M./M.S.</td>
<td>3 semesters, 0 if A.M./M.S. completed at Stanford</td>
<td></td>
</tr>
<tr>
<td>plus Ph.D.</td>
<td>45 unduplicated units beyond A.M./M.S. plus 36 unduplicated units for Ph.D.</td>
<td>3 semesters, 0 if A.M./M.S. completed at Stanford</td>
<td></td>
</tr>
<tr>
<td>Ph.D.</td>
<td>3 years of resident course</td>
<td>9 semesters</td>
<td></td>
</tr>
<tr>
<td>D.M.A./A.B./B.S.</td>
<td>work and research beyond Ed.D., including 72 units of course work and research done at Stanford</td>
<td>9 semesters</td>
<td></td>
</tr>
<tr>
<td>plus two</td>
<td>108 units (36 unduplicated units for each degree)</td>
<td>9 semesters</td>
<td></td>
</tr>
<tr>
<td>plus Engineer</td>
<td>Engineer requirements plus 36 unduplicated units for the doctoral degree</td>
<td>9 semesters, 0 if A.M./M.S. completed at Stanford</td>
<td></td>
</tr>
<tr>
<td>plus M.D.</td>
<td>Ph.D. requirement plus M.D. requirement</td>
<td>9 semesters, 0 if A.M./M.S. completed at Stanford</td>
<td></td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Ph.D. requirement plus 100 GSB units including 6 GSB qtrs.</td>
<td>9 semesters, 0 if A.M./M.S. completed at Stanford</td>
<td></td>
</tr>
<tr>
<td>two</td>
<td>36 unduplicated units beyond the first Ph.D.</td>
<td>12 semesters</td>
<td></td>
</tr>
<tr>
<td>two</td>
<td>36 unduplicated units for each degree beyond the first A.M./M.S.</td>
<td>12 semesters</td>
<td></td>
</tr>
<tr>
<td>M.D.</td>
<td>221 units</td>
<td>13 Med. School qtrs. for transfer students</td>
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</tr>
<tr>
<td>plus one</td>
<td>M.D. requirement plus 36 units</td>
<td>13 Med. School qtrs.</td>
<td></td>
</tr>
<tr>
<td>M.D.</td>
<td>36 units</td>
<td>13 Med. School qtrs. plus 3 qtrs.</td>
<td></td>
</tr>
<tr>
<td>plus two</td>
<td>M.D. requirement plus 36 units with first A.M./M.S.</td>
<td>13 Med. School qtrs. plus 3 qtrs.</td>
<td></td>
</tr>
<tr>
<td>plus Ph.D.</td>
<td>M.D. requirement plus 36 units</td>
<td>13 Med. School qtrs. plus 3 for Ph.D.</td>
<td></td>
</tr>
<tr>
<td>plus M.B.A.</td>
<td>M.D. requirement plus GSB requirement</td>
<td>13 Med. School qtrs. plus 6 GSB qtrs.</td>
<td></td>
</tr>
<tr>
<td>plus J.D.</td>
<td>M.D. requirement plus J.D. requirement</td>
<td>13 Med. School qtrs. plus 6 Law School qtrs.</td>
<td></td>
</tr>
<tr>
<td>M.L.S.</td>
<td>30 semester units</td>
<td>2 Law School semesters</td>
<td></td>
</tr>
<tr>
<td>J.S.M.</td>
<td>26 semester units</td>
<td>2-4 Law School semesters, depending on program</td>
<td></td>
</tr>
<tr>
<td>J.S.D.</td>
<td>J.D. requirement plus 26 units</td>
<td>2 Law School semesters</td>
<td></td>
</tr>
<tr>
<td>J.D.</td>
<td>68 additional law units beyond first semester</td>
<td>6 Law School semesters</td>
<td></td>
</tr>
<tr>
<td>plus M.D.</td>
<td>J.D. requirement plus M.D. requirement</td>
<td>6 Law School semesters</td>
<td></td>
</tr>
<tr>
<td>M.B.A.</td>
<td>100 units (84 in GSB)</td>
<td>6 GSB qtrs.</td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

1. The specific unit requirement for each master’s degree program is determined by the department. The University minimum requirement is 36 unduplicated units; department requirements may be higher.
2. The specific University residency and units requirements for a bachelor’s/master’s program are described above under Residency and Unit Requirements in Coterminal Programs.

**UNIVERSITY MINIMUM UNITS REQUIREMENT**

Each Stanford graduate degree or combination of degrees is subject to a requirement specifying the minimum number of units that must be earned at Stanford. The minimum units requirement for most degrees and degree combinations is listed in the chart above.

The minimum units requirement measures the units completed by the student, without regard for whether the units were earned in courses required for the degree and/or courses that are not part of the department’s course requirements. Study at another institution never counts towards the minimum units requirement, unless the courses were taken through Stanford’s Exchange Scholar Program or formal exchange program with U.C. Berkeley or U.C. San Francisco.

When multiple degrees are being pursued, units must be “unduplicated.” This means that units counted towards one degree may not be counted again towards another.

For all graduate degrees, the University’s expectation is that the units counted towards the minimum unit requirement are primarily in graduate courses. The University has set specific requirements for units applied...
to the minimum unit requirement for the A.M., M.S., M.A.T, and M.F.A. degrees: all units must be in courses at or above the 100 level and at least 50 percent of those must be courses designated primarily for graduate students (typically at least the 200 level). Units earned in courses below the 100 level may not be counted towards the minimum unit requirement for the master’s degree. Department specifications for the level of course work accepted for a particular master’s degree program may be higher than the University’s specifications.

SATISFACTORY PROGRESS REQUIREMENTS
The academic requirements for graduate students include timely completion of degree and program requirements, such as admission to candidacy, successful completion of qualifying exams, and so on. The standards for students in professional degree programs are described in the bulletins for the schools of Business, Law, and Medicine. Students in other degree programs must also meet the following standards of satisfactory progress as indicated by registration and reporting of grades.

Graduate students registered at full tuition must enroll for at least 11 units and must pass, over the course of three quarters, a total of 24 units, and at least 8 units per term. Those registered at the 9-unit rate must pass, over the course of three quarters, a total of 18 units, and at least 6 units per term. Students with permission to register for 8 units or fewer must complete a proportionate number of units, unless other requirements are specified.

Department requirements for satisfactory progress that set higher standards (as to units to be completed or grades to be maintained) take precedence over the University policy.

Students identified as not meeting the requirements for satisfactory progress are reviewed by their departments to determine whether the problem lies with administrative matters such as reporting of grades or with academic performance. Students have the opportunity to explain any special circumstances. Approval for continuation in the degree program is contingent on agreement by the student and department to a suitable plan to maintain satisfactory progress in subsequent quarters. Dismissal of graduate students is addressed below.

Graduate students who have been granted Terminal Graduate Registration (TGR) status must enroll each term in the TGR course (801 for master’s and Engineer programs or 802 for doctoral programs) in their department in the section appropriate for the adviser. An ‘N’ grade signifying satisfactory progress must be received each quarter to maintain registration privileges. An ‘N’ - grade indicates unsatisfactory progress. The first ‘N’ - grade constitutes a warning. A second consecutive ‘N’ - grade will cause the student to be denied further registration until a written plan for completion of degree requirements has been approved by the department. Subsequent ‘N’ - grades are grounds for dismissal from the program.

GUIDELINES FOR DISMISSAL OF GRADUATE STUDENTS FOR ACADEMIC REASONS
Admission to graduate programs at Stanford is highly selective. It is anticipated that every admitted student will be able to fulfill the requirements for the advanced degree. This policy provides guidelines for the unusual circumstance that a department must consider dismissal of a graduate student for academic reasons. These guidelines apply to all advanced degree programs except those in the schools of Law or Business or the M.D. program in the School of Medicine. Business, Law, and M.D. programs follow guidelines issued by the respective school.

The principal conditions for continued registration are a timely completion of the University, department, and program requirements for that program, and satisfactory progress (as discussed in the preceding section). The guidelines that follow specify procedures for dismissal of graduate students who are not meeting these conditions. In such cases, the department (through the chair, the Director of Graduate Studies, or the student’s faculty adviser) will:

1. Where possible and as early as possible, warn students, in writing, of the situation and deficiency. A detailed explanation of the reason for the warning should be provided.
2. Consider extenuating circumstances.

3. Place a summary of department discussions, votes, and decisions about this matter in the students’ files.
4. Provide students the opportunity to examine their department files, if requested.
5. Provide students with information on their rights to appeal under the statement on Student Academic Grievance Procedures. (This is included in this bulletin.)

Careful records of department decisions safeguard the rights of both students and faculty.

ADDITIONAL SPECIFICS FOR DEGREES WITH CANDIDACY

Before Candidacy—A department committee may vote to dismiss a student who is clearly not making satisfactory progress before review for admission to candidacy. Before considering dismissal, the committee should communicate with the student (which may include a meeting with the student) concerning his or her academic performance and how to correct deficiencies.

In a review for admission to candidacy, if the department votes not to recommend the student for admission to candidacy, the vote will result in the dismissal of the student from the program. The Director of Graduate Studies or the student’s adviser shall communicate the department’s decision to the student in writing and orally. The student may submit a written request for reconsideration. The committee shall respond in writing to the request for reconsideration; it may refuse to reconsider its decision.

During Candidacy—When a student admitted to candidacy is not making satisfactory progress or not completing University, department, or program requirements, the student’s adviser, the Director of Graduate Studies, and other relevant faculty should meet with the student. A written summary of these discussions shall be sent to the student and the adviser and added to the student’s department file. The summary should specify the student’s academic deficiencies, the steps necessary to correct them, and the period of time that is allowed for their correction (normally a minimum of one academic quarter). At the end of the warning period, the department’s Graduate Studies Committee should review the student’s progress and notify the student of its proposed actions. If the student has made satisfactory progress, he or she should be notified in writing that the warning has been lifted.

If, at the end of the warning period, the student has not in the view of the Graduate Studies Committee corrected the deficiencies, the committee may initiate proceedings for dismissal. The student shall be notified, in writing, that the case of dismissal will be considered at an impending department committee meeting. The student has the right to be invited to attend a portion of the scheduled meeting to present his or her own case; a student may also make this case to the committee in writing.

After full discussion at the department committee meeting, the committee, without the student present, reviews the case and votes on the issue of dismissal. A minimum of three faculty members must be present, and a decision is by majority vote. The student is sent a written summary of the discussion, including the committee’s decision and the reasons for it. The student may submit a written request for reconsideration. The department committee may refuse to reconsider its decision. The committee’s response to the request for reconsideration shall be made in writing.

CONFERRAL OF DEGREES

Upon recommendation to the Senate of the Academic Council by the faculty of the relevant departments or schools and the Committee on Graduate Studies, degrees are awarded four times each year, at the conclusion of Autumn, Winter, Spring, and Summer terms. All diplomas, however, are prepared and awarded in Spring Quarter. Stanford University awards no honorary degrees.

Students must apply for conferral of a graduate degree by filing an Application to Graduate before the deadline of each term. The application should be filed preferably in the second week, but no later than the last day of classes of the conferral quarter, as listed on the University calendar. A separate application must be filed for each degree program and for each conferral term. Applications are filed through Axess, the on-
Requests for conferral are reviewed by the Degree Progress Office, and the student's department, to verify completion of degree requirements. Registration is required in the conferral term or the term immediately preceding. Students with unmet financial obligations resulting in the placement of a hold on their registration will not receive a transcript, statement of completion, degree certificate, or diploma until the hold is released by the Bursar’s Office.

Students who wish to withdraw a request for conferral or make changes to the Application to Graduate should notify the Degree Progress Office in writing. Students who withdraw their graduation applications or fail to meet degree requirements must reapply to graduate for a subsequent term.

CHANGES OF DEGREE PROGRAMS

Graduate students are admitted to Stanford for a specific degree program. Students who have attended Stanford for at least one term and who are currently enrolled or on an approved leave of absence may submit a Graduate Program Authorization Petition to make one of the following changes: (1) change to a new degree program in the same department; (2) change to a new degree program in a different department; (3) add a new degree program in the same or a different department to be pursued with the existing program. Coterminous students must have the bachelor’s degree conferred before adding a second advanced degree program.

It is important that the attempt to add or change degree programs be made while enrolled. Otherwise, a new Application for Graduate Admission must be submitted and an application fee paid. The Graduate Program Authorization Petition is submitted directly to the department in which admission is requested. If applying for a higher degree program, students may also be required to submit other application materials such as GRE Subject Test scores, a statement of purpose, or new letters of recommendation.

International students changing departments or degree programs must also obtain the approval of the Foreign Student Adviser at the Bechtel International Center. If the requested change lengthens their stay, they also are required to submit verification of sufficient funding to complete the new degree program.

Students who wish to terminate study in a graduate program should submit to the department a letter indicating the program from which they wish to withdraw and the effective date. To return to graduate study thereafter, the student is required to apply for reinstatement (if returning to the same degree program) or admission (if applying to a different program). Both applications require payment of a fee.

DEGREE-SPECIFIC REQUIREMENTS

MASTER OF ARTS AND MASTER OF SCIENCE

In addition to completing the general requirements for advanced degrees and the requirements specified by their department, candidates for a Master of Arts (A.M.) or Master of Science (M.S.) degree must complete their degree requirements within the time limit specified below and must outline an acceptable program of study on the Master's Degree Program Proposal.

MASTER'S PROGRAM PROPOSAL

Students pursuing an A.M., M.F.A., M.A.T., or M.S. are required to submit an acceptable program proposal to their department during the first quarter of enrollment. Coterminous students must submit the proposal during the first quarter after their completion of 180 units. The program proposal establishes a student's individual program of study to meet University and department degree requirements. Students must amend the proposal formally if their plans for meeting degree requirements change.

In reviewing the program proposal or any subsequent amendment to it, the department confirms that the course of study proposed by the student fulfills all department course requirements (for example, requirements specifying total number of units, course levels, particular courses, sequences, or substitutes). The department confirms that all other department requirements (for example, required projects, foreign language proficiency, or qualifying exams) are listed on the form and that all general University requirements (minimum units, residency, and so on) for the master's degree will be met through the proposed program of study.

TIME LIMIT FOR COMPLETION OF THE MASTER’S DEGREE

All requirements for a master’s degree must be completed within three years after the student’s first term of enrollment in the master’s program. Students pursuing a coterminous master’s degree must complete their requirements within three years of their first quarter of graduate standing.

The time limit is not automatically extended by a student’s leave of absence. All requests for extension, whether prompted by a leave or some other circumstance, must be filed by the student before the conclusion of the program’s time limit. Departments are not obliged to grant an extension. The maximum extension granted is one additional year. Extensions require review of academic progress and any other factors regarded as relevant by the department, and approval by the department.

MASTER OF BUSINESS ADMINISTRATION

The degree of Master of Business Administration (M.B.A.) is conferred on candidates who have satisfied the requirements established by the faculty of the Graduate School of Business and the general requirements for advanced degrees. Full particulars concerning the school requirements are found in the Graduate School of Business bulletin. The M.B.A. must be completed within the time limit for completion of the master’s degree.

MASTER OF ARTS IN TEACHING

The program leading to the Master of Arts in Teaching (M.A.T.) is designed for experienced teachers or for individuals who have previously completed programs of teacher preparation. In addition to completing the general requirements for advanced degrees and the program requirements specified by the School of Education, candidates for the degree of Master of Arts in Teaching (M.A.T.) candidates must fulfill the requirements for a master’s program proposal as specified above and complete their degrees within the time limit for completion of the master’s degree.

MASTER OF FINE ARTS

In addition to completing the general requirements for advanced degrees and the program requirements specified in the "Art and Art History" section of this bulletin, candidates for the degree of Master of Fine Arts (M.F.A.) must fulfill the requirements for a master’s program proposal and complete their degrees within the time limit for completion of the master’s degree, as specified above.

ENGINEER

In addition to completing the general requirements for advanced degrees and the requirements specified by their department, candidates for the degree of Engineer must be admitted to candidacy and must complete a thesis per the specifications below.

CANDIDACY

The Application for Candidacy for Degree of Engineer is an agreement between the student and the department on a specific program of study to fulfill degree requirements. Students must apply for candidacy by the end of the second quarter of the program. Honors Cooperative students must apply by the end of the fourth quarter of the program. Candidacy is valid for five calendar years.
THESIS

A University thesis is required for the Engineer degree. Standards for professional presentation of the thesis have been established by the Committee on Graduate Studies and are detailed in Directions for Preparing Theses for Engineer Degrees, available from the Degree Progress Office in the Old Union.

The deadline for submission of theses for degree conferral in each term is specified by the University calendar. Three copies of the thesis, bearing the approval of the adviser under whose supervision it was prepared, must be submitted to the Degree Progress Office before the quarterly deadline listed on the University calendar. A fee is charged for binding copies of the thesis.

Registration is required for the term, or the immediately preceding term, in which the thesis is submitted. The period between the last day of final exams of one term and the first day of the subsequent term is considered an extension of the earlier term. Students submitting a thesis during this period would meet the registration requirement but would be eligible for degree conferral only in the subsequent term.

EDUCATIONAL SPECIALIST

In addition to completing the general requirements for advanced degrees and the program requirements specified in the "Education" section of this bulletin, candidates for the degree of Educational Specialist (Ed.S.) must complete a field-based project.

MASTER OF LEGAL STUDIES

Admission to study for the Master of Legal Studies degree (M.L.S.), a nonprofessional degree, is granted to students who hold the Doctor of Philosophy (Ph.D.) or other nonlaw doctoral degree, or who have been admitted to a nonlaw doctoral program and have completed a program of study amounting to 45 quarter units or 30 term units of work toward the doctorate, and who meet an admission standard equivalent to that required of candidates for the Doctor of Jurisprudence degree.

The M.L.S. degree is conferred upon candidates who, in not fewer than two academic terms in residence and in not more than two consecutive academic years, successfully complete 30 term units of work in the School of Law, including three first-year courses in the first autumn term and at least one course or seminar requiring a research paper. All work shall conform to the rules and regulations of the University and the School of Law.

DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence (J.D.) is conferred on candidates who satisfactorily complete courses in law totaling the number of units required under the current Faculty Regulations of the School of Law over not less than three academic years and who otherwise have satisfied the requirements of the University and the School of Law.

DOCTOR OF MUSICAL ARTS

The degree of Doctor of Musical Arts (D.M.A.) is conferred on candidates who have satisfied the general requirements for advanced degrees, the program requirements specified in the "Music" section of this bulletin, and the candidacy requirement as described below in the "Doctor of Philosophy" section.

DOCTOR OF EDUCATION

In addition to completing the general requirements for advanced degrees and the requirements specified by the School of Education, candidates for the Doctor of Education (Ed.D.) degree must fulfill the following requirements as detailed in the "Doctor of Philosophy" section below: candidacy, University oral examination, and dissertation.

MASTER OF THE SCIENCE OF LAW

The degree of Master of the Science of Law (J.S.M.) is conferred upon candidates who have completed one academic year (26 term-units) with distinction in accordance with the rules of the University and the School of Law.

The degree is primarily designed for those qualified students who hold a J.D. or its equivalent and who are at the Stanford School of Law for independent reasons (for example, as teaching fellows) and who wish to combine work toward the degree with their primary academic activities. Specially qualified lawyers, public officials, academics, and other professionals who have worked outside the United States may apply for the degree through the Stanford Program in International Legal Studies (SPILS). Full particulars concerning requirements may be found in the Stanford University bulletin School of Law.

DOCTOR OF THE SCIENCE OF LAW

The degree of the Doctor of the Science of Law (J.S.D.) is conferred upon candidates who hold a J.D. or its equivalent, who complete one academic year in residence, and who, as a result of independent legal research, present a dissertation that is, in the opinion of the faculty of the School of Law, a contribution to knowledge. Such work and dissertation shall conform to the rules of the School of Law and the University, as described below in the "Doctor of Philosophy" section.

Candidacy is limited to students of exceptional distinction and promise. Full particulars concerning requirements may be found in the Stanford University bulletin School of Law.

DOCTOR OF MEDICINE

Candidates for the degree of Doctor of Medicine (M.D.) must satisfactorily complete the required curriculum in medicine. All requirements for the M.D. degree are detailed in the Stanford University School of Medicine Catalog.

DOCTOR OF PHILOSOPHY

The degree of Doctor of Philosophy (Ph.D.) is conferred on candidates who have demonstrated substantial scholarship, high attainment in a particular field of knowledge, and ability to do independent investigation and present the results of such research. They must satisfy the general requirements for advanced degrees, the program requirements specified by their departments, and the doctoral requirements described below. The option for a Ph.D. minor is also described below, though it is not a Ph.D. requirement.

CANDIDACY

Admission to a doctoral degree program is preliminary to, and distinct from, admission to candidacy. Admission to candidacy for the doctoral degree is a judgment by the faculty of the student's potential to complete successfully the requirements of the degree program. Students are expected to complete department qualifying procedures and apply for candidacy by the end of their second year in the Ph.D. program. Honors Cooperative students must apply by the end of their fourth year.

The Application for Candidacy specifies a departmentally approved program of study to fulfill degree requirements, including required course work, language requirements, teaching requirements, dissertation (final project public lecture-demonstration for D.M.A.), and University oral examination (for Ph.D. and Ed.D.). At least 3 units of work must be taken with each of four Stanford faculty members.

If the Ph.D. student is pursuing a minor, approval by the department awarding the minor is also required on the Application for Candidacy.

TIME LIMIT FOR COMPLETION OF A DEGREE WITH CANDIDACY

All requirements for the degree must be completed before candidacy expires. Candidacy is valid for five years unless terminated by the department (for example, for unsatisfactory progress). The time limit is not automatically extended by a student's leave of absence. All requests for extension, whether prompted by a leave or some other circumstance, must be filed by the student before the conclusion of the program's time limit. Departments are not obliged to grant an extension. The maximum extension granted is one additional year. Extensions require review by the department of a dissertation progress report, a timetable for completion of the dissertation, any other factors regarded as relevant by the department, and approval by the department.
TEACHING AND RESEARCH REQUIREMENTS

A number of departments require their students to teach (serving as a teaching assistant) or assist a faculty member in research (serving as a research assistant) for one or more quarters as part of their doctoral programs. Detailed information is included in the department sections of this bulletin.

FOREIGN LANGUAGE REQUIREMENT

Some departments require a reading knowledge of one or more foreign languages as indicated in department sections of this bulletin. Fulfillment of language requirements must be endorsed by the chair of the major department on the Foreign Language Report form.

UNIVERSITY ORAL EXAMINATION

Passing a University oral examination is a requirement of the Ph.D. and Ed.D. degrees. The purpose of the examination is to test the candidate’s command of the field of study and to confirm fitness for scholarly pursuits. Departments determine when, after admission to candidacy, the oral examination is taken and whether the exam will be a test of knowledge of the field, a review of a dissertation proposal, or a defense of the dissertation.

Students must be registered in the term in which the University oral examination is taken. The period between the last day of final exams of one term and the first day of the following term is considered an extension of the earlier term. Candidacy must also be valid.

The University Oral Examination Committee consists of at least five Stanford faculty members: four examiners and the committee chair from another department. All members are normally on the Stanford Academic Council, and the chair must be a member. Emeritus faculty are also eligible to serve as examiners or chair of the committee. (A petition for appointment of an examining committee member who is not on the Academic Council may be approved if that person contributes an area of expertise that is not readily available from the faculty.) The chair of the examining committee may not have a full or joint appointment in the adviser’s or student’s department, but may have a courtesy appointment in the department. The chair can be from the same department as any other member(s) of the examination committee and can be from the student’s minor department provided that the student’s adviser does not have a full or joint appointment in the minor department.

The University Oral Examination form must be submitted to the department graduate studies administrator at least two weeks prior to the proposed examination date. The examination is conducted according to the major department’s adopted practice, but it should not exceed three hours in length, and it must include a period of private questioning by the examining committee.

Responsibility for monitoring appointment of the oral examination chair rests with the candidate’s major department. Although the department cannot require the candidate to approach faculty members to serve as chair, many departments invite students and their advisers to participate in the process of selecting and contacting potential chairs.

The candidate passes the examination if the examining committee casts four favorable votes out of five or six, five favorable votes out of seven, or six favorable votes out of eight. Five members present and voting constitute a quorum. If the committee votes to fail a student, the committee chair sends within five days a written evaluation of the candidate’s performance to the major department and the student. Within 30 days and after review of the examining committee’s evaluation and recommendation, the chair of the student’s major department must send the student a written statement indicating the final action of the department.

DISSERTATION

An approved doctoral dissertation is required for the Ph.D., Ed.D., and J.S.D. degrees. The doctoral dissertation must be an original contribution to scholarship or scientific knowledge and must exemplify the highest standards of the discipline. If it meets this standard, the dissertation is approved for the school or department by the doctoral dissertation reading committee. Each member of the reading committee signs the signature page of the dissertation to certify that the work is of acceptable scope and quality. One reading committee member reads the dissertation in its final form and certifies on the Certificate of Final Reading that department and University specifications have been met.

Dissertations must be in English. Approval for writing the dissertation in another language is normally granted only in cases where the other language or literature in that language is also the subject of the discipline. Such approval is routinely granted for dissertations in the Division of Literatures, Cultures, and Languages, in accordance with the policy of the individual department. Dissertations written in another language must include an extended summary in English.

Directions for preparation of the dissertation are available from the Degree Progress Office in the Old Union. The signed dissertation copies and accompanying documents must be submitted to the Degrees Progress Office on or before the quarterly deadline indicated in the University’s academic calendar. A fee is charged for the microfilming and binding of the dissertation copies.

Registration is required for the term, or the immediately preceding term, in which the dissertation is submitted. The period between the last day of final exams of one term and the first day of the subsequent term is considered an extension of the earlier term. Students submitting a dissertation during this period would meet the registration requirement but would be eligible for degree conferred only in the subsequent term. At the time the dissertation is submitted, an Application to Graduate must be on file, all of the department requirements must be complete, and candidacy must be valid through the term of degree conferred.

DOCTORAL DISSERTATION READING COMMITTEE

The Doctoral Dissertation Reading Committee consists of the principal dissertation adviser and two or other readers. At least one member must be from the student’s major department. Normally, all members are on the Stanford Academic Council. The student’s department chair may, in some cases, approve the appointment of a reader who is not on the Academic Council, if that person is particularly well-qualified to consult on the dissertation topic and holds a Ph.D. or equivalent foreign degree.

Former Stanford Academic Council members, emeritus professors, and non-Academic Council members may serve on a reading committee. If they are to serve as the principal dissertation adviser, however, the appointment of a co-adviser who is currently on the Academic Council is required.

The reading committee, as proposed by the student and agreed to by the prospective members, is endorsed by the chair of the major department on the Doctoral Dissertation Reading Committee form. This form must be submitted before approval of Terminal Graduate Registration (TGR) status or before scheduling a University oral examination that is a defense of the dissertation. The reading committee may be appointed earlier, according to the department timetable for doctoral programs. All subsequent changes to the reading committee must be approved by the chair of the major department.

Ph.D. MINOR

Students pursuing a Ph.D. may pursue a minor in another department or program to complement their Ph.D. program. This option is not available to students pursuing other graduate degrees. Ph.D. candidates cannot pursue a minor in their own major department or program.

Except for a Ph.D. minor in Applied Linguistics and Social Science History, only departments that offer a Ph.D. may offer a minor, and those departments are not required to do so. The minor should represent a program of graduate quality and depth, including core requirements and electives or examinations. The department offering the minor establishes the core and examination requirements. Elective courses are planned by the students in conjunction with their minor and Ph.D. departments.

The minimum University requirement for a Ph.D. minor is 20 units of course work at the graduate level (courses numbered 200 and above). If a minor department chooses to require those pursuing the minor to pass the Ph.D. qualifying or field examinations, the 20-unit minimum can be reduced. All of the course work for a minor must be done at Stanford.

Units taken for the minor can be counted as part of the overall requirement for the Ph.D. of 72 units of graduate course work done at Stanford, but cannot be counted as part of the 36 unduplicated units for the Ph.D.
itself. Courses used for a minor may not be used also to meet the requirements for a master’s degree.

A Ph.D. minor form outlining a program of study must be approved by the major and minor departments. This form is submitted at the time of admission to candidacy and specifies whether representation from the minor department on the University oral examination committee is required.

ADVISING AND CREDENTIALS

ADVISING

By the start of their first term, students should be paired by the department with faculty advisers who assist them in planning a program of study to meet degree requirements. The department should also ensure that doctoral students are informed in a timely fashion about procedures for selecting a dissertation adviser, reading committee members, and orals committee members. Departments should make every effort to assist doctoral students who are not admitted to candidacy in finding an appropriate adviser.

Students are obliged to follow department procedures for identifying advisers and committee members for their dissertation reading and orals examinations.

Occasionally, a student’s research may diverge from the area of competence of the adviser, or irreconcilable differences may occur between the student and the faculty adviser. In such cases, the student or the faculty adviser may request a change in assignment. If the department decides to grant the request, every effort must be made to ensure that the student is paired with another suitable adviser. This may entail some modification of the student’s research project.

In the rare case where a student’s dissertation research on an approved project is in an advanced stage and the dissertation adviser is no longer available, a new adviser must be appointed, usually from the student’s reading committee. This may also require that a new member be added to the reading committee before the draft dissertation is evaluated, to keep the reconstituted committee in compliance with the University requirements for its composition.

PUBLIC SCHOOL CREDENTIALS

Stanford University acts as agent for the California Commission on Teacher Credentialing in recommending students for credentials for service in California public schools upon completion of a Stanford approved program. The University offers complete training programs for the Single Subject Teaching Credential and the Preliminary Administrative Services Credential.

The student expecting to complete the fifth-year requirement for a teaching credential must submit a proposed course of study to the Credential Office in the School of Education at the beginning of the first quarter of study.
Academic Policies and Statements

COMPLIANCE WITH UNIVERSITY REGULATIONS

Registration as a student constitutes an agreement by the student to abide by University regulations, including those concerning admissions, registration, academic performance, student conduct, public health, use of the libraries, operation of vehicles on campus, University facilities, and the payment of fees and assessments. Many of these regulations are set forth in this bulletin while others are available in relevant University offices.

Graduate students should also take responsibility for informing themselves in particular of University policy on intellectual property, environmental health and safety, and scientific misconduct. These policies are described in the Research Policy Handbook and the Graduate Student Handbook.

The University reserves the right to withhold registration privileges or to require the withdrawal of any student who is not in compliance with its regulations.

ACADEMIC INSTRUCTIONAL USE OF VERTEBRATE ANIMALS

It is the policy of Stanford University that the use of either live or deceased vertebrate animals for solely instructional purposes is permitted (1) when the cognizant instructor(s) judges that the educational goals of the program or course are best achieved by such usage, and (2) when the Administrative Panel on Laboratory Animal Care determines that such usage is humane, proper, and appropriate and that it is consistent with government principles and regulations for the utilization and care of vertebrate animals used in teaching and research. Only the minimum number of animals essential to instructional objectives should be used. Instructors should be encouraged to use alternatives to animals whenever feasible.

INFORMATION TO STUDENTS

Academic departments and programs should alert prospective students if any courses required for a major or degree involve the use of animals. This requirement may be met by a statement to the effect that some required courses for certain degrees may involve the use of animals or animal tissue and that interested students should seek further information about such requirements from the department.

Instructors must inform their students during the first week of class if animals or animal tissue will or may be used as part of that course. Students who have concerns about the use of animals may then choose whether or not to take the class. Students should feel free to discuss their concerns with the instructor, but they should be aware that instructors and departments are not obligated to alter course requirements that are consistent with University policies.

PROCEDURES FOR USE OF ANIMALS

Any faculty member who intends to use vertebrate animals for teaching purposes must submit an Animal Use Protocol, signed by the department chair, to the Administrative Panel on Laboratory Animal Care. Reuse of previously preserved material requires no approval. Courses taught each year with no significant changes in animal usage must submit a Renewal Animal Use Protocol every year.

The protocol must include information about the sources from which animals are procured. In addition, the protocol must explain why animals are needed to achieve the goals of the course and must justify the species and the number of animals to be used. Questions from the Administrative Panel on Laboratory Animal Care regarding the species of animal chosen, the procurement process, the number of animals to be used, or other related matters must be resolved before the animals may be ordered.

Live vertebrate animals must be cared for according to Federal, State, or local regulations, and Stanford University policies and practices relevant to the use of laboratory animals. Disposal of animal tissue must be in compliance with relevant health and safety regulations.

REGISTRATION AND RECORDS

REGISTRATION AND STUDY LISTS

Students register for each term by submitting a Registration Commitment through the mail, in person, or through the computerized registration system, Axess. No student may attend any classes without a valid student identification card.

As early as possible, but no later than the second Sunday of the quarter, students (including those with TGR status) must submit to the Registrar’s Office, via Axess, a study list to enroll officially in classes for the quarter. Students may not enroll in more units than their tuition charge covers, nor enroll in courses for zero units unless those courses, like TGR, are defined as zero-unit courses. Undergraduate students are subject to academic load limits described in the “Amount of Work” section below.

The University reserves the right to withhold registration from, and to cancel the advance registration or registration of, any student having unmet obligations to the University.

For full registration procedures, see the quarterly Time Schedule.

STUDY LIST CHANGES

Students may add courses or units to their study lists through the end of the third week of classes. (Individual faculty may choose to close their classes to new enrollments at an earlier date.) Courses or units may be added only if the revised program remains within the normal load limits.

Courses may be dropped by students through the end of the fourth week of classes, without any record of the course remaining on the student’s transcript. No drops are permitted after this point, regardless of the grade or notation recorded in the course.

A student may withdraw from a course after the drop deadline through the end of the eighth week of each quarter. In this case, a grade notation of “W” (for “Withdrew”) is automatically recorded on the student’s transcript for that course. Students who do not officially withdraw from a class by the end of the eighth week are assigned the appropriate grade or notation by the instructor to reflect the work completed.

Through the end of the sixth week of classes, students may elect the grading option of their choice in courses where the option of letter or Credit/No Credit grading is offered.

If the instructor allows a student to take an "I" (incomplete) in the course, the student must make the appropriate arrangements for that with the instructor by the last day of classes.

These policies reflect changes adopted by the Faculty Senate on June 2, 1994 which were effective Autumn Quarter 1995-96. The deadlines described above follow the same pattern each quarter but, due to the varying lengths of Stanford’s quarters, they may not always fall in exactly the week specified. Students should consult the Time Schedule for the deadline dates each term.

REPEATED COURSES

Students may not enroll in courses for credit for which they received either Advanced Placement or transfer credit.

Some Stanford courses may be repeated for credit; they are specially noted in this bulletin. Most courses may not be repeated for credit. Under the general University grading system, when a course which may not be repeated for credit is retaken by a student, the following special rules apply:

1. A student may retake once any course on his or her transcript (regardless of grade or notation earned), or from which she or he withdrew, and have the original grade or notation replaced by the notation 'RP' (repeated course). When retaking a course, the student must enroll in
it for the same number of units originally taken. Upon completion of
the retake, units for the first occurrence are automatically lowered to
zero, the grade is changed to an 'RP,' and the second occurrence is
flagged on the student's transcript to indicate that it is a repeated
course.
2. The student may not retake the same course again (for a third time),
unless he or she received a 'NC' (No Credit), 'NP' (Not Passed), or
'W' (Withdraw) when it was taken the second time. Upon comple-
tion of the third attempt, the units for the first and second time are
automatically lowered to zero. The third attempt appears on the tran-
script with its units, grade, and the special flag to indicate that it is a
repeated course.

These policies reflect changes adopted by the Faculty Senate on June

AMOUNT OF WORK

The usual amount of work for undergraduate students is 15 units per
quarter; 180 units are required for graduation. Registration for fewer than
12 units is rarely permitted and may cause the undergraduate to be inel-
igible for certification as a full-time student. The maximum is 20 units
(21 if the program includes a 1-unit activity course). The maximum may
be exceeded only for compelling reasons. A past superior academic per-
formance is not considered to be sufficient justification for exceeding the
maximum. Petitions for programs of fewer than 12 or more than 20 units
must be signed by the student's adviser and submitted to the Office of
Academic Standing, Old Union, room 141. For additional information
regarding satisfactory academic progress, refer to the "Academic Stand-
ing" section of this bulletin.

Graduate students are normally expected to enroll in no more than 24
units; registration for more than 24 units must be approved by the depart-
ment. Under certain circumstances, graduate students may register on a
part-time basis. See the "Tuition, Fees, and Housing" section of this
bulletin.

During the eight-week Summer Quarter, 16 units is the maximum for
all students. For details, see the Stanford University bulletin, Summer

UNIT OF CREDIT

Every unit for which credit is given is understood to represent approx-
imately three hours of actual work per week for the average student. Thus,
in lecture or discussion work, for 1 unit of credit, one hour per week may
be allotted to the lecture or discussion and two hours for preparation or
subsequent reading and study. Where the time is wholly occupied with
drawing, field, or laboratory work, or in the classroom work of conver-
sation classes, three full hours per week through one quarter are expect-
ed of the student for each unit of credit; but, where such work is supple-
mented by systematic outside reading or experiment under the direction of
the instructor, a reduction may be made in the actual drawing, field,
laboratory, or classroom time as seems just to the department.

AUDITING

No person shall attend any class unless he or she is a fully registered
student enrolled in the course or meets the criteria for auditors. Auditors
are not permitted in courses that involve direct participation such as lan-
guage or laboratory science courses, fieldwork, art courses with studio
work, or other types of individualized instruction. Auditors are expect-
ed to be observers rather than active participants in the courses they at-
tend, unless the instructors request attendance on a different basis.
Stanford does not confer credit for auditing; nor is a permanent record
kept of courses audited.

In all cases of auditing, the instructor's consent and the Registrar's
approval are required. Further information is available from the Regis-
trar's Office.

WITHDRAWAL FOLLOWING REGISTRATION

Students who wish to withdraw from the current quarter, or from a
quarter for which they have registered in advance and do not wish to at-
tend, must file a leave of absence petition with the Registrar's Office.
More information is available in the "Refunds" section of this bulletin
and, for graduate students, in General Requirements in the "Graduate
Degrees" section of this bulletin.

RECORDS

TRANSCRIPTS

Transcripts of Stanford records are issued by the Registrar's Office
upon the student's request when submitted in writing or via the online
Axess system. There is no charge for official transcripts. The courses
taken and grades given in one quarter will not appear on any student's
transcript until all grades received by the grade deadline have been re-
corded; generally, this is two weeks after final exams. The University
reserves the right to withhold transcripts or records of students with un-
met obligations to the University.

CERTIFICATION OF ENROLLMENT OR DEGREES

The Registrar's Office can provide oral or written confirmation of
registration, enrollment, or degree status. The printed certification can
be used whenever enrollment or degree verification is required for car
insurance, loan deferments, medical coverage, scholarship purposes, and
so on. Using Axess, students are able to order an official certification,
at no charge, that can be picked up at the Registrar's Office on the next
business day. Certification of full- or part-time enrollment cannot be
provided until after the quarterly study list is filed.

Degrees are conferred quarterly, but diplomas are issued at the Com-
 mencement exercises which are held only in June. After conferral, the
degree awarded to a student can be verified by contacting the Registrar's
Office for an official transcript, a certification form, or an oral confirma-
tion via telephone. Requests for transcripts must be made by the student
in writing or through Axess.

Full-time enrollment for undergraduates is considered to be enroll-
ment in a minimum of 12 units of course work per quarter at Stanford.
Work necessary to complete units from previous quarters will not count
toward the 12 units necessary for full-time status in the current quarter.
Enrollment in 8 to 11 units is considered half-time enrollment. Enroll-
ment in 1 to 7 units is considered less-than-half-time, or part-time enroll-
ment.

All undergraduate students who are considered to be in good standing for the purposes of enrollment certification
Stanford uses the following definitions to certify the enrollment sta-
tus of graduate students each quarter:

Full-time: 9 or more units
Half-time: 6, 7 or 8 units
Part-time: 5 or fewer units

Registered TGR students are certified as fulltime.

Only information classified by the University as directory informa-
tion (see below) can be confirmed to inquirers other than the student.

PRIVACY OF STUDENT RECORDS

NOTIFICATION OF RIGHTS UNDER FERPA

The Family Educational Rights and Privacy Act (FERPA) affords
students certain rights with respect to their education records. They are:
1. The right to inspect and review the student's education records with-
in 45 days of the date the University receives a request for access.

The student should submit to the Registrar, Dean, chair of the
department, or other appropriate University official, a written request
that identifies the record(s) the student wishes to inspect. The Uni-
versity official will make arrangements for access and notify the stu-
dent of the time and place where the records may be inspected. If the
records are not maintained by the University official to whom the
request was submitted, that official shall advise the student of the
correct official to whom the request should be addressed.
2. The right to request the amendment of the student's education records
that the student believes are inaccurate or misleading.

A student may ask the University to amend the record that he or
she believes is inaccurate or misleading. The student should write the
University official responsible for the record, clearly identify the part
of the records he or she wants changed, and specify why it is inaccurate or misleading.

If the University decides not to amend the record as requested by the student, the University will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment.

Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

3. The right to consent to disclosures of personally identifiable information contained in the student’s education records, except to the extent that FERPA authorizes disclosure without consent.

One exception which permits disclosure without consent is disclosure to school officials with legitimate educational interests. A school official is a person employed by the University in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the University has contracted (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.

Another exception is that the University discloses education records without consent to officials of another school, in which a student seeks or intends to enroll, upon request of officials at that other school.

4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the University to comply with the requirements of FERPA.

The name and address of the office that administers FERPA is: Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue, SW, Washington, DC, 20202-4605.

DIRECTORY INFORMATION

The University respects the following items of information as “directory information,” that is, information that the University may make available to any person upon specific request (and without student consent):

- Name
- Date of birth
- Place of birth
- Directory address and phone number
- Electronic mail address
- Mailing address
- Campus office address (for graduate students)
- Secondary mailing or permanent address
- Residence assignment and room or apartment number
- Specific quarters or semesters of registration at Stanford
- Stanford degree(s) awarded and date(s)
- Major(s), minor(s), and field(s)
- University degree honors
- Institution attended immediately prior to Stanford
- Photographs for University classroom use

Students may prohibit the release of any of these items listed above by designating which items should not be released on the Privacy function of Axess.

Students, faculty, and others with questions regarding student records should contact the Registrar’s Office.

CONSENT TO USE OF PHOTOGRAPHIC IMAGES

Registration as a student and attendance at or participation in classes and other campus and University activities constitutes an agreement by the student to the University’s use and distribution (both now and in the future) of the student’s image or voice in photographs, videotapes, electronic reproductions, or audiotapes of such classes and other campus and University activities.

If any student in a class where such photographing or recording is to take place does not wish to have his or her image or voice so used, the student should raise the matter in advance with the instructor.

STANFORD UNIVERSITY ID NUMBER

The Stanford University ID is a number assigned to each student’s academic record for unique identification. It is printed on the Stanford University ID card and on documents distributed by the Registrar’s Office and other administrative offices.

SUNET ID

The SUNet ID provides access to the Stanford University Network (SUNet) and its services, and identifies authorized users of these services. Each member of the Stanford electronic community creates a unique SUNet ID and password for him/herself.

SUNET IDs provide:

- Axess services
- Email service
- Storage space within Stanford’s distributed file system
- Usenet newsgroups
- World Wide Web services, including serving of personal web pages on the Leland system and access to Stanford Web Resources

IDENTIFICATION CARDS

ID cards are available to registered students, faculty, and regular staff through the Office of the Registrar, Old Union.

Married students or students with a domestic partner (same or opposite sex) may obtain a courtesy identification card for their spouse/partner through the Registrar’s Office, Old Union. The spouse/partner card enables use of some campus services during terms for which the student is registered.

Similar courtesy cards are also available to the spouses and same-sex partners of faculty and regular staff.

PERSONAL IDENTIFICATION NUMBERS

Students eligible to use on-line services such as Axess, obtain a PIN through the Registrar’s Office. The PIN, coupled with the assigned University identification number, uniquely identifies the student and serves in a place of a signature on electronic forms. The PIN and SUNet ID password must remain confidential. It is a violation of University policy to use another’s PIN or identification number to misrepresent yourself in any way. Use of another student’s PIN or SUNet ID password can result in loss of student privileges or other disciplinary action.

EXAMINATIONS

MIDTERMS

Classes that give midterm examinations outside of regular class hours must: (1) announce the date and time during the first week of the academic quarter, and (2) provide reasonable alternative times to those students for whom these announced times are not convenient. According to Honor Code interpretations and applications, different examinations may be given at these alternative times.

END-QUARTER POLICY STATEMENT

The End-Quarter Period is a time of reduced social and extracurricular activity preceding final examinations. Its purpose is to permit students to concentrate on academic work and to prepare for final examinations.

In Autumn, Winter, and Spring quarters, End-Quarter starts seven full days (to begin at 12:01 a.m.) prior to the first day of final exams. In Spring Quarter, final examinations begin on Friday; no classes are held on Thursday, the day before. In Summer Quarter, this consists of the weekend and the four class days preceding the final examinations, which take place on Friday and Saturday of the eighth week. (See the Time Schedule for dates.)
During the End-Quarter Period, classes are regularly scheduled and assignments made; this regular class time is used by instructors in whatever way seems best suited to the completion and summation of course material. Instructors should neither make extraordinary assignments nor announce additional course meetings in order to “catch up” in course presentations that have fallen behind. They are free, however, and even encouraged to conduct optional review sessions and to suggest other activities that might seem appropriate for students preparing for final examinations.

No graded homework assignments, mandatory quizzes, or examinations should be given during the End-Quarter Period except:

1. In classes where graded homework assignments or quizzes are routine parts of the instruction process.
2. In classes with laboratories where the final examination will not test the laboratory component. In such a case, the laboratory session(s) during the End-Quarter Period may be used to examine students on that aspect of the course.

Major papers or projects about which the student has had reasonable notice may be called due in the End-Quarter Period.

Take-home final examinations, given in place of the officially scheduled in-class examination, may be distributed in the End-Quarter Period. Although the instructor may ask students to return take-home examinations early in the final examination period, the instructor may not call them due until the end of the regularly scheduled examination time for that course. Such a policy respects the principle that students’ final examinations are to be scheduled over a period of several days.

End-quarter examinations may not be held during this period. This policy preserves the instruction time for courses and protects the students’ opportunities for extensive review and synthesis of their courses.

During the End-Quarter Period, no musical, dramatic, or athletic events involving compulsory student participation may be scheduled, unless approved as exceptions by the Committee on Academic Appraisals and Achievement, nor may routine committee meetings be scheduled (such as those of the ASSU, the Senate of the Academic Council, or the committees of the President of the University) when such meetings normally would involve student participation.

Note—Students who believe that there are faculty who are violating End-Quarter policy should contact the Registrar’s Office.

END-QUARTER EXAMINATIONS

Examinations are part of the process of education at the same time that they are a means to measure the student’s performance in course work. Their structure, content, frequency, and length are to be determined in accordance with the nature of the course and the material presented in it, subject only to the limitations contained herein.

Great flexibility is available regarding the types of examinations that an instructor may choose to employ. Examinations, including final examinations, may be, for example, in-class essay examinations, take-home essay examinations, objective examinations, oral examinations, or appropriate substitutes such as papers or projects. Instructors may use any type of examination, paper, or project, or any combination thereof, guided only by the appropriateness of the types of examinations, papers, or projects for the material upon which the student is being examined.

When the final examination is an in-class examination, the following regulations apply:

1. A three-hour period is reserved during examination week for the final examination in each course of more than 2 units. This examination period must be available for students, but not necessarily in its entirety, if an in-class examination is given. In courses with extraordinary meeting times, such that ambiguity might exist as regards the period reserved for the final examination, the schedule should be clarified and students informed no later than the end of the second week of the quarter.
2. Examinations in 1- or 2-unit courses must be completed by the end of the last class meeting before the End-Quarter Period, except in Summer Quarter when examinations must be completed during the last regularly scheduled class session.

When the final examination or its appropriate substitute is not an in-class examination (for example, when an instructor chooses to employ a take-home examination, paper, or project in lieu of an in-class examination), the following regulations apply:

1. The schedule and format of the final examination or its appropriate substitute shall be made known not later than the end of the second week of the quarter and, if changed subsequently, may be only an option of the plan originally announced by the instructor.
2. Although the instructor may ask students to return take-home examinations early in the final examination period, the instructor may not call them due until the end of the regularly scheduled examination time for that course.

In submitting official Study Lists, students commit to all course requirements, including the examination procedures chosen and announced by the course instructor. In selecting courses, students should take cognizance of the official schedule of final examinations announced in the quarterly Time Schedule. Students anticipating conflicts in final examination schedules should seek to resolve these with the instructors involved before submitting Study Lists at the end of the second week of the quarter. If accommodation cannot be made at that time, the student should revise his or her Study List in order to be able to meet the required final examination.

If unforeseen circumstances prevent the student from sitting for the regularly scheduled examination, instructors should make alternative arrangements on an individual basis. Such unforeseen circumstances include illness, personal emergency, or the student’s required participation in special events approved as exceptions by the Committee on Academic Appraisal and Achievement (for example, athletic championships).

STATEMENT CONCERNING EARLY EXAMINATIONS

Students are reminded that taking final examinations earlier than the scheduled time is a privilege, not a right. They should request this privilege only in the event of extraordinary circumstances.

Since the final examination schedule is published quarterly in the Time Schedule at the time of course selection and enrollment, students are expected to make their academic plans in light of known personal circumstances that may make certain examination times difficult for them.

In general, faculty members are discouraged from giving final examinations earlier than the published and announced times. If faculty nevertheless decide to administer early examinations, either the questions should be completely different from those on the regularly scheduled examination or the early examination should be administered in a highly controlled setting. An example of such a setting would be a campus seminar room where the examination questions would be collected along with students’ work and students would be reminded of their Honor Code obligations not to share information about the examination contents. Giving students easy opportunities to abuse the integrity of an examination is unfair to honest students and inconsistent with the spirit of the Honor Code.

Academic fields differ in the degree to which early examination requests present dilemmas for faculty. If, for example, an examination format consists of a small number of essay questions, where students would be greatly advantaged by knowing the question topics, faculty should be especially reluctant to allow early examinations unless they are willing to offer totally different examinations or a different kind of academic task, for example, a final paper in lieu of an examination.

GRADING SYSTEMS

GENERAL UNIVERSITY

The general University grading system is applicable to all schools of Stanford University except the Graduate School of Business, the School of Law, and M.D. students in the School of Medicine. Note that the GPA (grade point average) and rank in class are not computed under the gen-
eral University grading system. Stanford does use an internal-only GPA which is based on units completed up to the time of conferral of the first bachelor's degree. This information is used for the internal purposes only and is not displayed on the official transcript which is sent outside the University. Note also that, as to graduate students, there may be departmental requirements as to grades that must be maintained for purposes of satisfactory progress.

DEFINITION AND EXPLANATION

The following reflects changes adopted by the Faculty Senate on June 2, 1994 and effective Autumn Quarter 1995-96. All grades/notations for courses taken in 1995-96 or later are to be visible on student transcripts.

A Excellent
B Good
C Satisfactory
D Minimum pass
(Plus (+) and minus (-) may be used as modifiers with the above letter grades)
NP Not Passed
NC No Credit (unsatisfactory performance, 'D+' or below equivalent, in a class taken on a satisfactory/no credit basis)
CR Credit (student-elected satisfactory; A, B, or C equivalent)
S No-option Satisfactory; A, B, or C equivalent
L Pass, letter grade to be reported
W Withdrawn
N Continuing course
I Incomplete
RP Repeated Course
* No grade reported

The notation 'NC' represents unsatisfactory performance in courses taken on a satisfactory/no credit basis. Performance is equivalent to letter grade 'D+' or below.

NP The notation 'NP' is used by instructors in courses taken for a credit/no credit basis. It is recorded when a student withdraws from a course. The 'NP' notation is not changed to another grade at the request of the student.

CR In a course for which some students will receive letter grades, the 'CR' represents performance that is satisfactory or better than the minimum pass grade and the student has elected the 'CR' grading option. This option is available in any course, subject to the consent of the instructor and department and to the student's observance of the time limit for electing or dropping the option (the end of the sixth week of the quarter).

S For an activity course or a course in which the instructor elects to grade students only on a satisfactory/no credit basis, the 'S' represents performance that is satisfactory or better. For such courses, no letter grades may be assigned for satisfactory completion of work.

GENERAL

The back of the End-Quarter Report (EQR) sheet shall carry only information explaining the significance of the various forms of entries described therein and a calendar for required submission of grades. No description of a "curve" system shall appear on EQR sheets, and instructors are discouraged from assigning grades according to any predetermined distribution system.

A student who takes a course in a school or program of the University other than the one in which he or she is matriculated is subject to the grading system of the school or program in which the course is given.

REPORTING OF GRADES

All grades must be reported within 96 hours after the time and day reserved for the final examination, and in no case later than noon of the fourth day (including weekends) after the last day of the final examination period.

In the case of degree candidates in Spring Quarter, final grades must be reported within 24 hours of the end of the final examination period.

REVISION OF END-QUARTER GRADES

When duly filed in the Registrar's Office, end-quarter grades are final and not subject to be revised except for a revision of judgment on the instructor's part; nor are passing grades to be revised on the basis of a second trial (for example, a new examination or additional work undertaken or completed after the date of the End-Quarter Report). Changes may be made at any time to correct an actual error in computation or in transcribing, or where some part of the student's work has been uninten-
tionally overlooked; that is, if the new grade is the one that would have been entered on the original report had there been no mistake in computing and had all the pertinent data been before the instructor, the change is a proper one.

If a student questions an end-quarter grade based on the grading of part of a specific piece of work (for example, part of a test) on the basis of one of the allowable factors mentioned in the preceding paragraph (for example, an error in computation or in transcribing, or work unintentionally overlooked, but not matters of judgment as mentioned below), the instructor may review the entire piece of work in question (for example, the entire test) for the purpose of determining whether the end-quarter grade was a proper one. In general, changing an end-quarter grade is permitted on the basis of the allowable factors already mentioned whether an error is discovered by the student or the instructor; however, changing a grade is not permitted by reason of revision of judgment on the part of the instructor.

In the event that a student disputes an end-quarter grade, the established grievance procedure should be followed (see the “Statement on Student Academic Grievance Procedures” section of this bulletin).

**GRADUATE SCHOOL OF BUSINESS**

Effective September 2000, subject to approval by the Faculty Senate, all courses offered by the Graduate School of Business will be graded according to the following five-level scheme:

- **H** Honors. Work that is of truly superior quality.
- **HP** High Pass. A passing performance, and one that falls approximately in the upper quarter of passing grades.
- **P** Pass. A passing performance that falls in the center of the distribution of all passing grades.
- **LP** Low Pass. A passing performance that falls approximately in the lower quarter of passing grades.
- **U** Unsatisfactory. A failing performance. Work that does not satisfy the basic requirements of the course and is deficient in significant ways.

Students in some GSB courses may elect to take the course on a pass/fail basis, where any passing grade (H, HP, P, or LP) is converted to Pass, and U is converted to Fail. Students wishing to take a GSB course on a pass/fail basis should consult the GSB Registrar for rules and procedures.

**SCHOOL OF LAW**

The two grading systems previously employed at the School of Law were revised effective September 1983. Under the letter grade systems (with numerical equivalents), the range of satisfactory grades runs from 4.3 to 2.3 as outlined in the following distribution. Below the grade of 2.3 is one level of restricted credit (R=2.2) and one level of failure (F=2.1). The letter grades and numerical equivalents are as follows:

- A+ 4.3
- A 4.0
- A- 3.7
- B+ 3.3
- B 3.0
- B- 2.7
- C+ 2.3
- C 2.0
- C- 1.7
- D+ 1.3
- D 1.0
- D- 0.7
- F 0.0

"N" is a temporary notation used in a continuing course; it is replaced with a final grade upon completion of the course series.

Students may elect to take a limited number of courses on a credit/ restricted credit/no credit system (K/RK/NK). "K" shall be awarded for work that is comparable to numerical grades 4.3 to 2.3, "RK" for R-level work (2.2), and "NK" for F-level work (2.1). A limited number of courses are offered on a mandatory credit (KM)/no credit basis.

**SCHOOL OF MEDICINE**

In general, the following grades are used in reporting on the performance of students in the M.D. program:

- **Pass** Indicates that the student has demonstrated to the satisfaction of the department or teaching group responsible for the course that he or she has mastered the material taught in the course.

- **Fail** Indicates that the student has not demonstrated to the satisfaction of the department or teaching group responsible for the course that he or she has mastered the material taught in the course.

**Incomplete** Indicates that extenuating medical or personal circumstances have prevented the student from completing the course requirements. This grade shall be given when requested by the student with the prior approval of the Dean for Student Affairs in the School of Medicine.

**Exempt** Indicates a course that is exempted by examination. No units are awarded for courses completed.

A "Fail" grade can be cleared by repeating and passing the particular course or by other arrangement prescribed by the department or teaching group. An "Incomplete" grade can be made up in a manner specified by the department or teaching group within a reasonable time; if the deficiency is not made up within the agreed-upon time, the "Incomplete" grade becomes a "Fail" grade. The opportunity to clear a "Fail" grade or an "Incomplete" grade cannot be extended to individuals who are not registered or eligible to register as students in the M.D. program. For more specific information, see the School of Medicine bulletin.

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**STATEMENT ON STUDENT ACADEMIC GRIEVANCE PROCEDURES**

The following policy was effective beginning in the 1999-2000 academic year and is subject to periodic review.

1. **Coverage**
   a) Any Stanford undergraduate or graduate student or postdoctoral fellow who believes that he or she has been subjected to an improper decision on an academic matter is entitled to file a grievance to obtain an independent review of the allegedly improper decision, followed by corrective action if appropriate. A grievance is a complaint in writing made to an administrative officer of the University concerning an academic decision, made by a person or group of persons acting in an official University capacity, that directly and adversely affects the student or postdoctoral fellow as an individual in his or her academic capacity.
   b) Grievance procedures apply only in those cases involving a perceived academic impropriety arising from decision taken by: (1) an individual instructor or researcher; (2) a school, department, or program; (3) a committee charged to administer academic policies of a particular school, department, or program; (4) the University Registrar or a Senate committee or subcommittee charged to administer academic policies of the Senate of the Academic Council. They do not pertain to complaints expressing dissatisfaction with a University policy of general application challenged on the grounds that the policy is unfair or inadvisable, nor do they pertain to individual school, department, or program academic policies, as long as those policies are not inconsistent with general University policy.
   c) Individuals should be aware that the University Ombudsman’s Office is available to all Stanford students, postdoctoral fellows, faculty, and staff to discuss and advise on any matter of University concern and frequently helps expedite resolution of such matters. Although it has no decision-making authority, the Ombudsman’s Office has wide powers of inquiry, including into student complaints against instructors.

2. **Grievance and Appeal Procedures**
   a) **Informal Attempts at Resolution:** the student or postdoctoral fellow first should discuss the matter, orally or in writing, with the individual(s) most directly responsible. If no resolution results, the student or postdoctoral fellow should then consult
with the individual at the next administrative level, for example, the chair or director of the relevant department or program, or, for those cases in which there is none, with the school dean. At this stage, the department chair or program director, if any, may inform the dean that the consultation is taking place and may solicit his or her advice on how to ensure that adequate steps are taken to achieve a fair result. Efforts should be made to resolve the issues at an informal level without the complaint escalating to the status of a formal grievance.

b) The Filing of the Grievance:
1. If informal means of resolution prove unsatisfactory, the student or postdoctoral should set forth in writing a statement of the decision that constitutes the subject matter of the dispute, the grounds on which it is being challenged, and the reasons why the grievant believes that the decision was improperly taken. The statement should also include a description of the remedy sought and the informal efforts taken to date to resolve the matter. It is at this point that the complaint becomes a formal grievance. The written grievance should specifically address the matters set forth in the Standards for Review, as stated in Section 4 below. The grievance should include an allegation of any adverse effects on the grievant, known to the grievant at the time of filing.

2. The grievance document should be submitted to the dean of the school in which the grievance arose; for a grievance concerning a decision of the University Registrar or of a Senate committee or subcommittee, the procedures set forth herein for grievances and appeals shall be modified as stated in Section 3 below. A grievance must be filed in a timely fashion, that is, normally within 30 days of the end of the academic quarter in which the adverse decision occurred or should reasonably have been discovered. A delay in filing a grievance may, taking all circumstances into account, constitute grounds for rejection of the grievance.

3. If the grievant is dissatisfied with the disposition of the grievance, the dean may, in appropriate cases, remand the grievance to a lower administrative level (including to the level at which the grievance arose) for further consideration.

4. Should attempts to resolve the matter informally not be successful, the Provost shall decide the appeal, and shall notify the grievant (and the party against whose decision the grievance has been filed) in writing of any referral of the matter and report to the Provost as the latter directs. The Provost may also, in appropriate cases, remand the matter to a lower administrative level (including to the level at which the grievance arose) for further consideration.

f) The Request to the President: if the student or postdoctoral fellow is dissatisfied with the disposition of the appeal by the Provost, he or she may write to the President of the University giving reasons why he or she believes the grievance result to be wrong (following the general format set forth in Section 2d above). No more than 30 days should elapse between the transmittal of the Provost’s disposition and the written statement to the President urging further appeal. In any case, the President may agree or decline to entertain this further appeal. If the President declines to entertain the further appeal, the decision of the Provost shall be final. If the President decides to entertain the further appeal, he or she shall follow the
general procedures set forth in Section 2e above, and the decision of the President shall be final.

3. Grievances Concerning Decisions of the University Registrar or of a Senate Committee or Subcommittee
   a) For a grievance concerning a decision of the University Registrar or of a Senate committee or subcommittee, the grievant shall file his or her grievance with the Provost, rather than with the dean, and the Provost shall handle that grievance in accordance with the procedures set forth in Section 2c above.
   b) There shall be no appeal of the Provost's disposition of that grievance, except as may be available under Section 2f above.

4. Standards for Review and Procedural Matters
   a) The review of grievances or appeals shall usually be limited to the following considerations:
      1. Were the proper facts and criteria brought to bear on the decision? Were improper or extraneous facts or criteria brought to bear that substantially affected the decision to the detriment of the grievant?
      2. Were there any procedural irregularities that substantially affected the outcome of the matter to the detriment of the grievant?
      3. Given the proper facts, criteria, and procedures, was the decision one which a person in the position of the decision maker might reasonably have made?
   b) The time frames set forth herein are guidelines. They may be extended by the relevant administrative officer in his or her discretion for good cause.
   c) Questions concerning the filing and appeal of grievances should be directed to the Office of the Provost.
COURSES OF INSTRUCTION

2000-01

Unless otherwise specified, courses numbered from 1 through 99 are primarily for first- and second-year undergraduates; courses numbered from 100 through 199 are for third- and fourth-year undergraduates; and those from 200 through 699 are for graduate students.

Amendments to course offerings announced in the Stanford Bulletin are found in the Time Schedule, issued quarterly.

Starting Autumn Quarter 1996, a new set of undergraduate degree requirements went into effect. In this edition of the Stanford Bulletin, a special notation follows each course description if the course can fulfill a requirement under the 1996 set of General Education Requirements or under the set of Distribution Requirements in effect Autumn 1991 through the end of the 1995 academic year. The 1991 set of requirements are designated within parentheses. Thus a course marked GER:2a may be used only towards the Natural Sciences sub-area within Area 2 of the new General Education Requirements. A course marked (DR:5) may be used only towards the Area 5 Natural Sciences requirement under the older 1991 set of Distribution Requirements. A course marked GER:2a (DR:5) has been approved to fulfill either requirement.

The Appendix of this bulletin presents a comprehensive list of courses certified as fulfilling a requirement under the 1996 system of General Education Requirements or the 1991 Distribution Requirements system.

Undergraduates fulfilling requirement sets in effect prior to 1991 should consult the Registrar's Undergraduate Degree Coordinator for information about whether a course may be applied to the requirement set applicable to them. Graduate students should ignore the various markings since such requirements do not apply to them.

SUMMER SESSION

Summer session courses are eight weeks in length, except in certain departments that offer ten-week courses.

This bulletin includes, for the Summer Session, only those courses that can be tentatively scheduled at publication time by each department. For the complete list of courses and faculty, refer to the Stanford University bulletin, Summer Session Catalogue, 2001, issued in January.
GRADUATE SCHOOL OF BUSINESS


Dean: Robert L. Joss
Senior Associate Deans: David M. Kreps, George G. C. Parker, Joel M. Podolny, Daniel N. Rudolph
Associate Dean: Joan M. Karlin
Assistant Deans: Christina Einstein, Marie Mookini, Jeffrey H. Moore, Sherrie Taguchi


Associate Professors: William P. Barnett, Peter M. DeMarzo, Steven R. Grenadier, Timothy J. Groseclose, Deborah H. Guenfeld, Pamela Haunschild, Chip Heath, Ron Kasznik, Daniel P. Kessler, Sunil Kumar, James M. Lattin, Michael W. Morris, Manju Puri, Sven Rady, Andrea Shepard, Stefanos Zenios, Jeffrey H. Zweibel


Professor (Teaching): George G. C. Parker

Consulting Professor: H. Irving Grousbeck

Visiting Professors: Terry L. Anderson, Henri-Claude de Bettignies, Robert B. Cialdini, Rajiv Grover, Debra E. Meyerson, John H. Roberts

Visiting Associate Professors: Katherine J. Klein, Richard K. Lyons, Edward F. McQuarrie

Visiting Assistant Professor: Seema Arora

The Graduate School of Business provides graduate education for careers in management, research, and teaching.

The two-year Master of Business Administration (M.B.A.) degree program is designed for the student preparing for a general management career. No specific undergraduate major or courses are required for admission, although prospective applicants are encouraged to have two or more years of managerial experience and to include some mathematics and economics in their undergraduate programs. Curricular options within the M.B.A. program include a certificate in Public Management or Global Management, the joint J.D./M.B.A. degree, and dual master's degrees in business and engineering.

The Stanford Sloan Program is an intensive one-year course of study for middle management executives leading to the degree of Master of Science in Management. Participants must be sponsored by their company and have demonstrated superior achievement.

Those interested in college teaching and research are served by the Doctor of Philosophy program.

For detailed information on programs, curricula, and faculty, write to the Graduate School of Business, Stanford University, Stanford, California 94305-5015 for the current bulletin.
School of Earth Sciences

Dean: Franklin M. Orr, Jr. (on leave, Autumn)
Acting Dean: Stephan A. Graham (Autumn)

The School of Earth Sciences includes the departments of Geological and Environmental Sciences, Geophysics, and Petroleum Engineering. The interschool Earth Systems Program offers study of the geological and biological processes that operate on global scales and how they interact with international environmental issues and policies. An honors program in Environmental Science, Technology, and Policy is also available through the Institute for International Studies.

The aims of the school are (1) to prepare students for careers in the fields of environmental studies, engineering, geology, geochemistry, geomechanics, geophysics, geostatistics, hydrogeology, petroleum engineering, and petroleum geology; (2) to conduct research in the Earth sciences; and (3) to provide opportunities for Stanford undergraduates to learn about our planet’s history, to understand the natural energy and resource base that underlies our economy, and to appreciate the geological and geophysical hazards that affect human societies, as well as those factors that contribute to the quality of our environment.

To accomplish these objectives, the school offers a variety of programs adaptable to the needs of the individual student: a four-year undergraduate program leading to the degree of Bachelor of Science (B.S.); a five-year program leading to the coterminous Bachelor of Science and Master of Science (M.S.), combining degrees in Earth sciences, social sciences, physical sciences, or engineering; and a graduate program offering the degrees of Master of Science, Engineer, and Doctor of Philosophy as described below. Details of individual departmental degree programs are found in the section for each department. In addition, it is possible for an undergraduate to develop an individually designed major in the Earth Sciences.

UNDERGRADUATE PROGRAMS

Any undergraduate student admitted to the University may declare a major in one of the Earth science departments or the interschool Earth Systems Program by contacting the appropriate department or program office. Students interested in creating an individually designed major should visit the dean’s office.

Specific requirements for the B.S. degree are listed in each department or program section. Departmental academic advisers work with students to define a career or academic goal and assure that the student’s curricular choices are appropriate to the pursuit of that goal. Advisers can help devise a sensible (and enjoyable) course of study that meets degree requirements and provides the student with opportunities to experience advanced courses, seminars, and research projects. To maximize such opportunities, students are encouraged to complete basic science and mathematics courses in high school or during their freshman year.

Each department (as well as Earth Systems) offers an honors program that involves research during the senior year. Each department also offers an academic minor for those undergraduates majoring in compatible fields.

COTERMINAL BACHELOR'S AND MASTER'S DEGREES

The Stanford coterminous degree plan enables an undergraduate to embark on an integrated program of study leading to the master’s degree before requirements for the bachelor’s degree have been completed. This may result in more expeditious progress toward the advanced degree than would otherwise be possible, making the program especially important to Earth scientists because the master’s degree provides an excellent basis for entry into the profession. The coterminous plan permits students to be admitted to a graduate program as early as their eighth quarter at Stanford, or after earning 105 units, and no later than the eleventh quarter.

Under the plan, the student may meet the degree requirements in the more advantageous of the following two ways: by first completing the 180 units required for the B.S. degree and then completing the three quarters required for the M.S. degree; or by completing a total of 15 quarters during which the requirements for the two degrees are completed concurrently. In either case, the student has the option of receiving the B.S. degree upon meeting all the B.S. requirements or of receiving both degrees at the end of the coterminous program. Students earn degrees in the same department (including Earth Systems), in two different departments, or even in different schools; for example, a B.S. in Physics and an M.S. in Geological and Environmental Sciences. Students are encouraged to discuss the coterminous program with their advisers during their junior year. Additional information is available in the individual department offices.

GRADUATE PROGRAMS

Admission to the Graduate Program—A student who wishes to enroll for graduate work in the school must be qualified for graduate standing in the University and in addition must be accepted by one of the school’s three departments. One requirement for admission is submission of scores on the verbal and quantitative sections of the Graduate Record Exam. Admission to one department of the school does not guarantee admission to other departments.

Faculty Adviser—Upon entering a graduate program, the student should report to the head of the department who will arrange with a member of the faculty to act as the student’s adviser. The student, in consultation with the adviser, then arranges a course of study for the first quarter and ultimately develops a complete plan of study for the degree sought.

Financial Aid—Detailed information on scholarships, fellowships, and research grants is available from the school’s individual departments. Applications should be filed by the various dates listed in the application packet for awards that become effective in Autumn Quarter of the following academic year.

EARTH SYSTEMS PROGRAM

Director: Pamela Matson
Advisory Committee: David Ackerly (Biological Sciences), Kevin Arrigo (Geophysics), Carol Boggs (Biological Sciences), Brendan Bohannan (Biological Sciences), Mark Denny (Biological Sciences, Hopkins Marine Station), Robert Dunbar (Geological and Environmental Sciences), Gary Ernst (Geological and Environmental Sciences), Walter Falcon (Institute for International Studies), Scott Fendorf (Geological and Environmental Sciences), Deborah Gordon (Biological Sciences, Lawrence Goulder (Economics, Institute for International Studies), Elizabeth Hadly (Biological Sciences), Donald Kennedy (Biological Sciences, Institute for International Studies), Julie Kennedy (Earth Systems), Jeffrey Koseff (Civil and Environmental Engineering), Anthony Kovscek (Petroleum Engineering), Gilbert Masters (Civil and Environmental Engineering), Pamela Matson (Geological and Environmental Sciences, Institute for International Studies), Michael McWilliams (Geological and Environmental Sciences), Stephen Monismith (Civil and Environmental Engineering), Harold Mooney (Biological Sciences), Rosamond Naylor (Institute for International Studies), Franklin Orr, Jr. (Dean, School of Earth Sciences), Adina Paytan (Geological and Environmental Sciences), Joan Roughgarden (Biological Sciences), Stephen Schneider (Biological Sciences, Institute for International Studies), Jonathan Stieblits (Geological and Environmental Sciences), James Sweeney (Management Science and Engineering), Barton Thompson (Law), Peter Vitousek (Biological Sciences), Virginia Walbot (Biological Sciences), Mark Zoback (Geophysics)
Senior Lecturer and Academic Coordinator: Julie Kennedy
The Earth Systems Program is an interdisciplinary environmental studies major. Students learn about and independently investigate complex environmental problems caused by human activities in interaction with natural changes in the Earth System. Earth Systems majors become skilled in those areas of science, economics, and policy needed to tackle the globe’s most pressing environmental problems, becoming part of a generation of scientists, professionals, and citizens who approach and solve problems in a new way: a systematic, interdisciplinary way.

For our students to be effective contributors to the solutions of such problems, their training and understanding must be both broad and deep. To this end, Earth Systems students take courses in the fundamentals of biology, calculus, chemistry, geology, and physics, as well as in computer science, economics, policy, and statistics. After completing breadth training in these areas, students concentrate on advanced course work in one of six focus areas: biology, energy, environmental economics and policy, geology, land management, or oceanography. Along with formal course requirements, all Earth Systems students complete a 9 unit (270 hour) internship. The internship provides a “hands-on,” rigorous academic experience working on a supervised field, laboratory, government or private sector project of their choice.

The following is an outline of the sequential knowledge and skills needed in this major.

1) The fundamental components of the Earth Systems: these help students understand current environmental problems against the backdrop of natural change.

   Training in the fundamentals comes through introductory course work in geology, biology, and economics. Depending on the Earth Systems track chosen, training may also include introductions to the study of the energy systems, microbiology, oceans, or soils. As students begin to question the role that humans play in affecting these systems, they find that many programs and departments at Stanford offer courses that approach this question from different directions. The department encourages students to come to the Earth Systems Office for course selection advice or to pick up a current list of environmental courses at Stanford.

2) The fundamental interactions among the physical, biological, and human components of the Earth System: these must be understood in order to understand and solve environmental problems.

   Several Earth Systems courses introduce students to the dynamic and multiple interactions that characterize global change problems. They include the introductory course, Introduction to Earth Systems, and three core courses, the Biosphere, the Geosphere, and the Anthroposphere.

   Competence in understanding system-level interactions is critical to development as an Earth Systems thinker, so additional classes that meet this objective are excellent choices as electives. More information on such classes is available in the program office.

3) To recognize, quantify, and report change in the environment, key analytical and computational tools and measurement systems are used for insight into global and regional environmental change, and are used to identify change and develop solutions.

   The test of an Earth Systems degree is the student’s ability to recognize, describe, quantify, and help solve complex problems that face our society. Through required cognates and specific track classes, students build skills in these areas. For example, training in satellite remote sensing and geographic information systems is either required or highly recommended for all tracks. Quantification of environmental problems requires solid training in calculus, linear algebra, physics, chemistry, programming, and statistics. These courses are required of all majors. Specialized training, such as in laboratory or field methods, may be necessary and is highly recommended.

   Having the ability to effectively communicate ideas and results is critical. Indeed, workable solutions to our environmental problems begin with common understanding of the issues. Writing intensive courses (WIM) help students to communicate complex concepts to expert and non-expert audiences alike. Stanford requires that each student complete one WIM course in his or her major. The Earth Systems major requires two writing intensive courses, Biosphere and Senior Seminar, with an option for a third course for coterminal master’s students through the Master’s Seminar. Oral communication skills are also a focus of the Senior Seminar and the Master’s Seminar.

4) To develop solutions to environmental problems that take into consideration natural processes as well as human needs, human needs must be met in a sustainable way.

   Many courses at Stanford focus on solutions. A comprehensive list of environmental courses, and advice on those that focus on problem solving, is available in the program office. Students can also review the quarterly Time Schedule for solution-based courses. Among others, the following departments may provide subject areas that are a useful guide: Anthropological Sciences, Biological Sciences, Civil and Environmental Engineering, Earth Systems, Economics, Geological and Environmental Sciences, Geophysics, Human Biology, International Policy Studies, International Relations, Latin America Studies, Law, Petroleum Engineering, Political Science, Public Policy, and Urban Planning. The Earth Systems Program emphasizes the importance of workable solutions in several ways, including a required 9-unit internship, knowledge synthesis in the Senior Seminar, and an optional upper division course on environmental problem solving.

   Students interested in Earth Systems should come to the program office for current information on our curriculum, alumni career paths, environmental jobs and internships, and undergraduate honors options. The Earth Systems Program provides a strong advising network that includes faculty, staff, and students.

**UNDERGRADUATE PROGRAMS**

**BACHELOR OF SCIENCE**

The B.S. in Earth Systems (ESys) requires the completion of at least 109 units that can be divided into three levels of courses. The student must complete a series of courses comprising a broad base of specialized study and must complete five required and three elective courses in that track. Finally, the student must carry out a senior-level research or internship project and participate in the senior seminar (WIM). Note: students interested in earning a California Teaching Credential for general high school science should contact the program office for specific guidelines.

**REQUIRED CORE**

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESys 10. Introduction to Earth Systems</td>
<td>3</td>
</tr>
<tr>
<td>ESys 110. Geosphere</td>
<td>3</td>
</tr>
<tr>
<td>ESys 111. Biosphere</td>
<td>3</td>
</tr>
<tr>
<td>ESys 112. Anthroposphere</td>
<td>5</td>
</tr>
<tr>
<td>ESys 210. Senior Seminar</td>
<td>4</td>
</tr>
<tr>
<td>ESys 260. Internship</td>
<td>9</td>
</tr>
</tbody>
</table>

**REQUIRED COGNATE COURSES**

**Biology (any one course below):**

* Biol. Sci. 51. Evolution, Genetics, and Ecology | 5 *
* or Biol. Sci. 52. Biochemistry, Molecular, and Cell Biology | 5 *

**Chemistry:**

* Chem. 31. Chemical Principles | 3 *
* Chem. 33. Organic Chemistry* | 4 *

**Computer Programming:**

* Comp. Sci. 106. Programming Methodology | 5 *
* or Comp. Sci. 138. Matlab and Maple for Science and Engineering Applications | 5 *

**Economics:**

* Econ. 1. Elementary Economics | 5 *
* Econ. 50. Economic Analysis I | 5 *

**Geological and Environmental Sciences:**

* Geol. & Envir. Sci. 1. Fundamentals of Geology | 4 *

**Mathematics:**

* Math. 19. Calculus and Analytic Geometry | 3 *
* Math. 20. Calculus and Analytic Geometry | 3 *
* Math. 21. Calculus and Analytic Geometry | 4 *
* or Math. 41. Calculus and Analytic Geometry | 5 *

49
Math. 42. Calculus and Analytic Geometry 5
and
Math. 51. Linear Equations and Differential Calculus 5
Probability and Statistics (any one course below):
Biol. Sci. 141. Biostatistics 4
Geol. & Envir. Sci. 160. Introduction to Statistical Methods for Earth and Environmental Sciences 4
Stat. 190. Statistics for Social Scientists 5
Physics:
Physics 41. Mechanics 4
Physics 47. Light and Heat* 4
(Additional physics cognate for Energy Track only)
Physics 43. Electricity 3

* Students may take either Physics 47 or Chem. 33; Biosphere students must take Chem. 33.

More extensive work in mathematics and physics may be expected for those planning graduate study. Graduate study in ecology and evolutionary biology and in economics requires familiarity with differential equations, linear algebra, and stochastic processes. Graduate study in geology and geophysics may require more physics and chemistry. Check with your advisor about recommendations beyond the requirements specified above.

TRACKS

GEOSPHERE

Geochemistry (choose one):
Geol. & Envir. Sci. 90. Introduction to Geochemistry 3
Geol. & Envir. Sci. 163. Introduction to Isotope Geology 3
Geol. & Envir. Sci. 170. Environmental Geochemistry 4
Geol. & Envir. Sci. 171. Geochemical Thermodynamics 3

Oceans/Atmosphere (choose one):
Geol. & Envir. Sci. 8. The Oceans: Introduction to the Marine Environment 3
Civ. & Envir. Engr. 63. Weather and Storms 3
Remote Sensing/GIS (choose one):
Geol. & Envir. Sci. 195. Integrating Remote Sensing and Geographic Information Systems 3
Geol. & Envir. Sci. 196. Introduction to GIS 2

Rocks/Minerals
Geol. & Envir. Sci. 80. Earth Materials 5

Surface Processes (choose one):
Geol. & Envir. Sci. 140. Geomorphology 3
Geol. & Envir. Sci. 151. Sedimentary Geology and Petrography 4-5

BIOSPHERE

Biol. Sci. 51. Evolution, Genetics, and Ecology 5
Biol. Sci. 52. Biochemistry, Molecular Biology, and Cell Biology 5
Biol. Sci. 53. Development and Physiology of the Organism 5
Biogeochemistry (choose one):
Biol. Sci. 124. Ecosystem Physiology 4
Biol. Sci. 216. Biogeochemistry/Ecosystem Ecology (same as Geol. & Envir. Sci. 220) 4
(See program office for new courses)
Geological Survey (choose one):
Biol. Sci. 144. Conservation Biology 4
or Biol. Sci. 173H. Marine Conservation Biology 3

Ecology (choose two):
Biol. Sci. 142. Principles of Ecology (same as Geophys. 176) 4
(See program office for new courses)

ANTHROSPHERE

Economics and Environmental Policy (choose three):
Econ. 51. Economic Analysis II 5
Econ. 102. Introduction to Econometrics 5
Econ. 106. The World Food Economy 5
Econ. 118. Economics of Development 5
Econ. 150. Economics and Public Policy 5
Econ. 160. Game Theory and Economic Application 5
Legal and Political Institutions and the Environment (choose one):
Econ. 154. Economics of Legal Rules and Policy 5

LAND MANAGEMENT

See program office for requirements.

ENERGY SCIENCE AND TECHNOLOGY

Civ. & Envir. Engr. 173B. The Coming Energy Revolution 3
Civ. & Envir. Engr. 176A. Energy Efficient Buildings 4
Civ. & Envir. Engr. 176B. Electric Power: Generation and Conservation 4
Esys 103. Energy Resources 3
or Esys 101. Energy and the Environment 3
Engr. 30. Engineering Thermodynamics 3

OCEANS

Physics of the Sea
Civ. & Envir. Engr. 164. Introduction to Physical Oceanography 4
Biological Oceanography (choose one):
Biol. Sci. 163H. Principles of Oceanic Biology 4
Geophys. 130. Biological Oceanography 4

Marine Chemistry
Geol. & Envir. Sci. 159. Marine Chemistry 3

Remote Sensing of the Ocean (choose one):
Geol. & Envir. Sci. 196. Introduction to GIS: Arc/Info and ARC-View 2
Geophys. 135. Remote Sensing of the Ocean 4
Coastal Ocean Dynamics: A Systems Approach
(See program office for new course information)

UPPER-DIVISION ELECTIVES

Three intermediate to advanced courses, 100-level or above, consistent with the primary track are required of all majors and are to be selected with the advice and consent of the adviser. Eligible upper-division electives are listed below. Additional courses may be selected; see the program office for the most current list.

GEOSPHERE TRACK

Esys 103. Energy Resources 3
Geol. & Envir. Sci. 110. Structural Geology 5-6
Geol. & Envir. Sci. 111. Structural Geology and Rock Mechanics 4
Geol. & Envir. Sci. 112. Structural and Engineering Geology II 2
Geol. & Envir. Sci. 164. Stable Isotopes 3
Geol. & Envir. Sci. 185. Volcanology 4
Geol. & Envir. Sci. 162. Cosmochemistry 3
Geol. & Envir. Sci. 220. Biogeochemistry 3
Geol. & Envir. Sci. 221. The Origins of the Solar System 3
Geol. & Envir. Sci. 223. Seminar in Environmental Problem Solving 3
Geol. & Envir. Sci. 254. Paleonanology 3
Geol. & Envir. Sci. 255. Introduction to Micropaleontology 5
Geol. & Envir. Sci. 257. Climate Variability 3

BIOSPHERE TRACK

Biol. Sci. 120. General Botany 5
Biol. Sci. 125. Ecosystems of California 3-4
Biol. Sci. 139. Biology of Birds 3
Biol. Sci. 184. Principles of Biosystematics 4
Biol. Sci. 161H. Invertebrate Zoology 5
Biol. Sci. 164H. Marine Botany 4
Biol. Sci. 217. Climate Theory, Modeling, Applications, and Implications 3
Biol. Sci. 283. Theoretical Populations Genetics 3
Geol. & Envir. Sci. 255. Introduction to Micropaleontology 5

ANTHROSPHERE TRACK

Anthro. Sci. 161. Conservation and Community Development in the Amazon 3-5
Civ. & Envir. Engr. 171. Environmental Planning Methods 4
Civ. & Envir. Engr. 266. Environmental Policy Design and Implementation 4
Econ. 158. Antitrust and Regulation 5
Econ. 165. International Economics 4
Econ. 243. Economics of the Environment 5
Geol. & Envir. Sci. 133. Introduction to Assessment of Environmental Risk 3
COTERMINAL B.S. AND M.S. DEGREES

The Stanford coterminal degree enables an undergraduate to embark on an integrated program of study leading to the master’s degree before requirements for the bachelor’s degree have been completed. An undergraduate majoring in Earth Systems may apply to work simultaneously toward B.S. and M.S. degrees. The M.S. degree in Earth Systems provides the student with enhanced tools to evaluate the primary literature of the discipline most closely associated with the student’s track and allows an increased specialization through additional course work that may include 9 units of thesis research. Integration of earth systems concepts is furthered by participation in the master’s seminar.

To apply, complete and return to the Earth Systems office an application that includes a statement of purpose, a Stanford transcript; two letters of recommendation, one of which must be from a faculty member of the program; and a list of courses that fulfill degree requirements signed by the student and the program advisor. The student must meet the following requirements:

1. All requirements for the B.S. degree.

2. Further course work (and/or thesis research), all of which should be at the 100-level or above, including 18 units at the 200-level or above, leading to further focus within the student’s track.

3. Participation in the master’s seminar.

The program consists of a minimum of 36 units of course work and/or thesis research, at least 18 of which must be at the 200-level or above.

The student must devise a program of study that shows a level of specialization appropriate to the master’s level, as determined in consultation with the adviser. At least 18 units must be at the 200-level or above.

The program should demonstrate further specialization and focus within the student’s undergraduate track.

With the adviser’s approval, 9 units may be in the form of research. This may culminate in the preparation of a master’s thesis; however, a thesis is not required for the degree. Master’s students must take part in the Winter Quarter master’s seminar (ESys 290) and have additional responsibilities appropriate to the master’s level (thesis presentation, modeling problems, and so on), 2 units.

A more detailed description of the coterminal master’s degree program may be obtained from the program office.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

UNDERGRADUATE

10. Introduction to Earth Systems—For non-majors and prospective Earth Systems majors. Multi-disciplinary approach to how the Earth works as a system, utilizing the tools of geology, biology, and economics to understand global change on all time scales. Topics: origin of the solar system and earth, paleoclimate and climate modeling, ocean-atmosphere circulation, extinction and speciation, energy and mineral resources, economic attitudes and the environment. Case studies: acid rain, hunger and food, policy and the environment. GER:2a (DR:5) 3-5 units, Win (Ernst)

101. Energy and the Environment—(Same as Petroleum Engineering 101.) Where the energy that powers society comes from, acknowledging that most current energy is generated from fossil resources. Case studies consider the consequences of current energy use patterns. Focus is on energy definitions, use patterns, resource estimation, pollution. Recommended: Mathematics 21 or 42, Engineering 30. 3 units, Spr (Kovscek)

103. Energy Resources—(Same as Civil and Environmental Engineering 173A.) Overview of oil, natural gas, coal, nuclear, hydro, solar, geothermal, biomass, wind, and ocean energy resources in terms of supply, distribution, recovery and conversion, environmental impacts, economics, policy, and technology. The opportunities for energy efficiency, electric power basics, the changing role of electric utilities, transportation basics, and energy use in developing countries. Field trip. Recommended: Civil and Environmental Engineering 70.

4 units, Aut (Woodward)

110. Geosphere—(Same as Geological and Environmental Sciences 120.) Geological processes, from local to global, affect people and civilization. The reverse is also true; civilization is beginning to influence the geosphere. The processes experienced at the earth’s surface (catastrophic earthquakes, volcanic eruptions, and longer term atmospheric and climate changes) are linked to what goes on in the earth’s deep interior. How geochemical, geophysical, and biological processes interact over time scales from 4.5 billion years to the nearly instantaneous. Topics: the origin and evolution of the atmosphere and oceans, heat flow and global tectonics and how they have changed over time, geochemical cycles, climate change, catastrophic impacts, and the roles played by organisms. Prerequisite: Geological and Environmental Sciences 1 or 2.

3 units, Aut (Paytan, Siebbins, McWilliams)
111. Biosphere—(Same as Biological Sciences 117.) The biological causes and consequences of anthropogenic and natural changes in the atmosphere, oceans, and terrestrial and freshwater ecosystems. Topics: glacial cycles and marine circulation, greenhouse gases and climate change, tropical deforestation and species extinctions, and human population growth and resource use. Prerequisites: Biological Sciences or Human Biology core, or graduate standing in any department.

3 units, Win (Matson, Vitousek, Mooney)

112. Anthroposphere: Human Interactions with the Earth and Environment—(Same as Economics 155.) The economic sources of environmental problems and the alternative policies for dealing with them (technology standards, emissions taxes, and marketable pollution permits). An evaluation of the policies addressing regional air pollution, global climate change, water allocation in the western U.S., and the use of renewable resources. The connections between population growth, economic output, environmental quality, and human welfare. Prerequisite: Economics 30.

5 units, Spr (Goulder)

124. The Global Environmental System—(Graduate students register for 224.) Among the effects of the expansion of population and economic activity in the 20th century were anthropogenic changes in the global environment. One of the admirable advances in human knowledge was the increase in understanding of the global environmental system. An overview of the functioning of the global environmental systems and society's impacts on the system, combining knowledge from different disciplines and using "systems thinking" as a framework for thinking about the global system.

2 units, Aut (Alcmao)

130. Biological Oceanography—(Same as Geophysics 130.) Interdisciplinary look at how oceanic environments control the form and function of marine life. Topics: distributions of planktonic production and abundance, nutrient cycling, the role of ocean biology in the climate system, an expected effect of climate changes on ocean biology. Local field trips on weekends. Prerequisites: Biological Sciences core, Geological and Environmental Sciences 8, or equivalent.

4 units, Spr (Arrigo)

135. Remote Sensing of the Ocean—(Same as Geophysics 135.) How to observe and interpret physical and biological changes in the oceans using remote technologies such as satellites and instrumented moorings. Topics: principles of satellite remote sensing, classes of satellite sensors and mooring platforms, converting radiometric data into biological quantities, sensor calibration and validation, interpreting large-scale oceanographic features. Prerequisites: Earth Systems 130 or Hopkins Marine 163H/263H.

4 units (Arrigo) alternate years, given 2001-02

147. Controlling Climate Change in the 21st Century—(Enroll in Human Biology 147.)

3 units, Aut (Schneider, Rosencrans)

150/240. Seminar in Sustainable Agriculture—The interactions of agriculture and environment and the range of meanings and approaches to sustainable agriculture. Topics: ecological, economic, institutional, and political aspects of sustainability as they pertain to a range of cropping systems. For 2 units: participation in team research evaluating current and potential sustainable agriculture approaches in specific global cropping systems. Group presentation on research findings.

1-2 units, Spr (Matson, Naylor, Kennedy) alternate years, not given 2001-02

159. Marine Chemistry—(Same as Geological and Environmental Sciences 159.) For upper-division undergraduates and graduate students in the earth, biology, and environmental sciences. The oceans are in interactive contact with the atmosphere, biosphere, and lithosphere, and virtually all elements pass through the ocean at some point in their cycles. The first-order processes take place within the sea, which affects its chemistry. What controls the distribution of chemical species in water and sediments? How long do different elements spend, on average, in the ocean? How do marine chemical processes interact with the biological, geological, and physical processes in the oceans? Prerequisite: Geological and Environmental Sciences 8, or the consent of the instructor.

3 units, Spr (Paytan)

164. Introduction to Physical Oceanography—(Same as Civil and Environmental Engineering 164.) Introduction to the dynamic basis of physical oceanography. Topics: a general description of the physical environment of the ocean; conservation equations for salt, heat, and momentum; geostrophic flows; wind-driven flows; the Gulf Stream; equatorial dynamics and ENSO; the thermohaline circulation of the deep oceans; and tides. Prerequisite: Physics 41.

4 units, Aut (Monismith)

166B. Fishing for Solutions: Issues in Marine Conservation—(Graduate students register for 266B, same as Anthropological Sciences 166B.) The stories behind communities and their fisheries relate to a resource we cannot see. The history of exploitation of cod, salmon, tuna, and grouper are instructive of the wider challenges facing marine resource management. The complex of cultural, biological, and economic facets that shape a fishery.

3-5 units, Win (Novy)


2-3 units (Thompson) not given 2000-01


3 units, Aut (Hewett)

189. Field Studies in Earth Systems—For advanced upper-division undergraduates and graduate students in Earth Systems, Biological Sciences, Geological and Environmental Sciences. Field-based, focusing on the components and processes by which terrestrial ecosystems function. Topics from geology, soil science, chemistry, biology, and ecology. Lecture, field, and lab studies emphasize standard field techniques, experimental design, analysis of data, and written and oral presentation. Small team projects test the original questions in the functioning of natural ecosystems. Admission by application, see Time Schedule. Prerequisites: Biological Sciences 141 or Geological and Environmental Sciences 160, or equivalent.

5 units, Spr (Ackerly, Chiarrello, Fendorf, Matson, E. Miller)

210. Senior Seminar in Earth Systems—Focus is on communication skills, oral and written. Each student presents results of the Earth Systems internship in an oral presentation and leads a follow-up round table discussion subsequent to talk. Group project analyzing local environmental problems requires an Earth Systems approach. Peer-reviews of internship papers as required. (WIM)

4 units, Aut, Spr (J. Kennedy)

223. Seminar in Sustainable Agriculture—(Same as Geological and Environmental Sciences 223.) For upper-division undergraduates and graduate students in the earth and biological sciences. Using case studies,
evaluates and contrasts the approaches that different natural and social science disciplines bring to environmental problem solving.

2-3 units (Matson, Naylor) alternate years, given 2001-02

250. Directed Research—Independent research into an aspect of earth systems related to the student’s primary track, carried out after the junior year, during the summer, and/or during the senior year. Student develops own project with faculty supervision, or can see adviser for research ideas. 10-15 page thesis required.

9 units, quarter by arrangement (Staff)

260. Internship—Supervised field, lab, private sector, or advocacy project, normally through an internship sponsored by government agencies, research institutions or other organizations, or independently developed by the student with the prior written approval of the academic coordinator. Provides hands-on experience within the student’s primary track. 10-15 page report required.

9 units, quarter by arrangement (J. Kennedy)

290. Master’s Seminar—Open to Earth Systems master’s students only. Focus is on critical examination and discussion of topics in Earth Systems. Requires independent research, oral presentation of results, and preparation of an original proposal for innovative Earth Systems science policy research.

2 units, Win (J. Kennedy)

298. Advanced Topics in Earth Systems—Open to Earth Systems master’s students only. Continuation of Winter Quarter master’s seminar.

2 units, Spr (J. Kennedy)

299. M.S. Thesis—Research in connection with the master’s paper.

1-9 units, any quarter (Staff)

GEOLOGICAL AND ENVIRONMENTAL SCIENCES

Chair: Jonathan F. Stebbins
Associate Chair: Stephen A. Graham
Associate Professors: Keith Loague, Michael O. McWilliams
Assistant Professors: Scott Fendorf, Adina Paytan
Professors (Research): Attila Aydin, J. Michael Moldovan
Associate Professor (Research): Christopher Chyba
Consortium Professors: Peter Brewer, David Clague, James O. Leckie
Consortium Associate Professors: Ronaldo I. Borja, Simon Klemperer, Debra Stokes
Consortium Assistant Professor: Kevin R. Arrigo
Senior Lecturer: George G. Mader
Consulting Professors: Richard Bernknopf, Paul Hsieh
Consulting Associate Professors: Joseph W. Ruets, Joseph Wooden
Visiting Professor: Dennis L. Corwin

* Joint appointment with Statistics
† Joint appointment with Geophysics
** Joint appointment with Petroleum Engineering
†† Joint appointment with Institute for International Studies
*** Recalled to active duty

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

The program leading to the Bachelor of Science degree in Geological and Environmental Sciences (GES) provides the background for a wide variety of careers. It prepares students for graduate studies in business administration, earth and environmental sciences, environmental engineering, land use planning, law, public service, and other professions in which an understanding of the earth and a background in science can be important. The geological sciences are broad and include study of the Earth’s history and the evolution of life; the oceans and atmosphere; the processes that shape the Earth’s mountains, continents, and landscape; the chemistry and physics of earth materials and their interactions with each other and with water; and sources of water, economic minerals, metals, and fuels. Within earth sciences, the environmental sciences emphasize the present and the future, particularly the ways in which humankind is affected by natural hazards such as volcanic eruptions and earthquakes and the ways in which we affect the planet and its viability by development, contamination of natural waters, and depletion of resources.

GES offers an undergraduate major leading to the bachelor’s degree in Geological and Environmental Sciences and three formal opportunities for specialization: Geological Sciences, Environmental Sciences, Engineering Geology, and Hydrogeology.

Students whose educational objectives are within the scope of the department, but not encompassed in a predefined program, may design an independent curriculum with the help of a faculty adviser and the approval of the department chair. All successful graduates receive the Bachelor of Science in GES. Students who enroll in a predefined program likewise may have the area of specialization designated as a field on their transcripts.

The Writing in the Major (WIM) requirement may be fulfilled by taking one of the following courses designated (WIM) for the larger unit total indicated: GES 110, 112, 151, 152, 185, 198 along with the 1-unit WIM Project course, GES 190. Students choosing to take a course for WIM credit should consult with the instructor early in the quarter; additional writing-intensive work is assigned.

GEOLOGICAL SCIENCES

The Geological Sciences curriculum leading to the B.S. degree in Geological and Environmental Sciences prepares students for professional careers and graduate studies in the earth sciences and other fields requiring an earth sciences background. The field of geological sciences is broad and involves the study of the physical and chemical processes that build continents, shape the earth's landscape, and determine the distribution of elements in minerals, rocks, soils, and natural waters; the oceans and atmosphere; Earth's history and the evolution of life; and the materials that constitute the earth, including those of economic importance. Geological sciences are also concerned with the ways in which society is affected by natural hazards (for example, volcanic eruptions, landslides, and earthquakes) and the ways in which society affects the planet (for example, the pollution of groundwater and depletion of resources).

An important emphasis of the B.S. program in the Geological Sciences curriculum is the study of earth processes and history in the natural laboratory of the field. Stanford University's location near the Pacific continental margin, the Sierra Nevada mountain range, and the San Andreas fault system provides a nearly unparalleled setting for field studies.

The field of geological sciences has evolved over the last two centuries from mostly observational and descriptive into a quantitative science dealing with the chemistry and physics of the earth and other planets and with interactions between the biological and physical systems of the earth. Thus, the Geological Sciences curriculum includes significant course work in chemistry, physics, and mathematics. The diversity of these requirements and experience results in graduates with versatility and a broad range of skills. The program is designed to recognize the diversity of this field and to provide a great deal of flexibility. A significant proportion of the required courses can be selected by the student in consul-
CORE COURSE SEQUENCE

Course No. and Subject Qtr. and Units
GES 1. Fundamentals of Geology A,W,S 5
  or GES 2,3. Earth History and Lab A 5
GES 80. Earth Materials A 5
GES 90. Introduction to Geochemistry W 3
GES 102. Introduction to Field Geology Sum 3
GES 110. Structural Geology S 5
  or GES 111. Structural Geology and Rock Mechanics A 4
GES 112. Mapping the Geologic Environment S 3
GES 151. Sedimentary Geology W
GES 152. Stratigraphy and Applied Paleoentology S 4
GES 160. Introduction to Statistical Methods for Earth and Environmental Science S 4
GES 181. Igneous and Metamorphic Processes S 3-5
GES 190. WIM Project A,W,S
Subtotal ........................................... 39-42

REQUIRED SUPPORTING SCIENCES AND MATHEMATICS

Course No. and Subject Qtr. and Units
Math. 20. Calculus W,S 3
Math. 21. Calculus S 4
Math. 41. Calculus* A 5
Math. 42. Calculus* A,W 5

Physics 22. Mechanics and Heat Lab A 1
Physics 23. Electricity and Optics W 1
Physics 24. Electricity and Optics Lab W 1
Physics 41. Mechanics† A 3
Physics 43. Electricity† W 1
Physics 45. Magnetism† S 3
Physics 46. Electricity and Magnetism Lab† S 1
Physics 47. Light and Heat† A 4
Subtotal ........................................... 30-36

* Math. 41, 42, 51 are recommended for students planning graduate study in the sciences or engineering.
† Physics 41, 43, 45, 47 are recommended for students planning graduate study in the sciences or engineering.

ELECTIVES

Choose four courses from the following list or, with faculty approval, four related, but more advanced courses:
Biol. Sci. 117. Biology and Global Change W 3
Chem. 33. Structure and Reactivity W,S,Sum
Comp. Sci. 106A. Programming Methodology A,W,S 5
GES 2, 3. Earth History and Lab (if not used above) A 5
GES 8. Oceans S 3
GES 140. Geomorphology W 3
GES 170. Environmental Geochemistry W 4
GES 185. Volcanology S 4-5
GES 187. Introduction to Ore Deposits A 4
GES 230. Physical Hydrogeology A 5
Geophys. 183. Interpretation of Seismic Reflection Profiles W 2-3

Geophys. 150. General Geophysics A 3-4
Subtotal ........................................... 11-20
Total .................................................. 81-98

ENVIRONMENTAL SCIENCES

Environmental Sciences in the School of Earth Sciences is concerned with the combined chemical, physical, and mathematical study of the outer crust of the earth and the hydrosphere as they are found today, and of the processes and stages through which our planet's surface has evolved. The program also deals with the impact of our use of land and natural resources, processes through which the earth may respond to human use, and the hazards these processes present to people on local and regional scales. In comparison, earth systems science focuses on some of the same topics on a global scale, and environmental engineering focuses on prevention, control, or mitigation of the negative aspects of human impact on the environment.

The Environmental Sciences curriculum provides a background in selected fundamental geological and physical sciences, basic quantitative analytical and problem-solving tools, and an introduction to the use of this background in anticipating, recognizing, and defining or diagnosing environmental problems. The primary focus is on earth sciences, the natural environment, and anthropogenic changes. Graduates should be equipped for positions in environmental consulting and remediation firms or government agencies or, with appropriate selection of electives, for graduate study in related fields including the geological sciences, environmental sciences or engineering, business or law, and others.

GES majors who elect the Environmental Sciences curriculum are expected to complete a core course sequence in supporting sciences and mathematics and a set of electives chosen from the prescribed list below. Substitutions for core and elective courses must be approved by the adviser and the department chair. Letter grades are required, if available, in all courses.

CORE COURSE SEQUENCE

Course No. and Subject Qtr. and Units
GES 1. Fundamentals of Geology A,W,S 5
GES 80. Earth Materials A 5
GES 90. Introduction to Geochemistry W 3
GES 102. Introduction to Field Geology Sum 3
GES 110. Structural Geology S 5
  or GES 111. Structural Geology and Rock Mechanics A 4
GES 112. Mapping the Geologic Environment S 4
GES 150. General Geophysics A 3-4
GES 151. Sedimentary Geology W
GES 152. Stratigraphy and Applied Paleoentology S 4
GES 160. Introduction to Statistical Methods for Earth and Environmental Science S 4
GES 170. Environmental Geochemistry W 4
GES 171. Geochemical Thermodynamics A 3
GES 172. Geochemistry S 4
GES 180. Fundamentals of Environmental Science S 4
GES 185. Volcanology S 4-5
GES 190. WIM Project A,W,S 1
GES 230. Physical Hydrogeology A
Subtotal ........................................... 45-46

REQUIRED SCIENCES AND MATHEMATICS

Course No. and Subject Qtr. and Units
Chem. 31. Chemical Principles A,W,Sum 4
Chem. 135. Physical Chemical Principles W 3
  or Chem. 171. Physical Chemistry A 3
  or GES 171. Geochemical Thermodynamics A 3

Choose one of the following groups of physics courses:
Physics 22. Mechanics and Heat Lab A 1
Physics 23. Electricity and Optics W 1
Physics 24. Electricity and Optics Lab W 1
Physics 41. Mechanics† A 3
Physics 43. Electricity† W 1
Physics 45. Magnetism† S 3
Physics 46. Electricity and Magnetism Lab† S 1
Physics 47. Light and Heat† A 4
Subtotal ........................................... 30-36

Choose one of the following groups of mathematics courses:
Math. 20. Calculus W,S 3
Math. 21. Calculus S 4

* Math. 41, 42, 51 are recommended for students planning graduate study in the sciences or engineering.
† Physics 41, 43, 45, 47 are recommended for students planning graduate study in the sciences or engineering.
The Department of Geological and Environmental Sciences offers a program leading to the Bachelor of Science in Geological and Environmental Sciences with honors. The program provides an opportunity for independent study and research on a topic of special interest culminating in a written report. The honors program is open to all seniors with a grade point average (GPA) of at least 3.5 in earth and environmental science courses and a minimum of 3.0 in all University course work. Modest financial support is available to help defray laboratory and field expenses incurred in conjunction with honors research. Students intending to pursue the honors program must submit an application to the department before the beginning of their senior year.

A student selects a research topic and prepares a research proposal in consultation with a faculty adviser or her or his choosing. Research undertaken for the honors program can be of a theoretical, field, or experimental nature, or a combination of these approaches.

Upon approval of the research proposal and formal entrance to the program, course credit for the honors research project and report preparation is assigned by the student's faculty adviser within the framework of GES 199; 3 units each quarter are assigned to the project for three quarters of the student's senior year for a total of 9 units. Research undertaken for the honors program cannot be used as a substitute for regularly required courses.

Both a written and an oral presentation of research results are required of honors students. A formal written report must be submitted to the student's research adviser no later than the fourth week of the student's final senior quarter. To graduate with honors, the report must be read, approved, and signed by the student's faculty adviser and a second member of the faculty. Before the end of the senior year, each honors candidate gives a public seminar on his or her research results.
The coterminal B.S./M.S. program offers a special opportunity for students to pursue a graduate research experience and a M.S. degree concurrently with or subsequent to their B.S. studies. The master's degree is viewed as an entrance professional degree in a number of subdisciplines within the earth sciences (for example, engineering geology, environmental geology). Alternatively, graduate course work and the master's research experience can provide an intermediate step prior to pursuit of the Ph.D. Regardless of their professional goal, coterminal B.S./M.S. students are treated as members of the graduate community and are expected to meet all of the standards set for regular M.S. students. Students should apply to the program after their seventh quarter (or after earning 105 units), but no later than their eleventh quarter. They are required to submit an application for entrance to the GES coterminal program including a statement of purpose, a copy of their current Stanford transcript, official Graduate Record Examination scores, letters of recommendation from two members of the Stanford faculty (at least one of whom must be in this department), and a list of courses in which they intend to enroll to fulfill degree requirements. Each student must complete a thesis or master's report describing the results of his or her research. Specific research interests should be noted in the statement of purpose and discussed with a member of the GES faculty prior to submission of an application to the coterminal program.

Graduate students in the Department of Geological and Environmental Sciences (GES) involve academic course work and independent research. Students are prepared for careers as professional scientists in research or the application of the earth sciences to mineral, energy, and water resources. Programs lead to the M.S., Engineer, and Ph.D. degrees. Course programs in the areas of faculty interest are tailored to the student's needs and interests with the aid of his or her research adviser. Students are encouraged to include in their program courses offered in other departments in the School of Earth Sciences as well as in other departments in the University. Diploma designate degrees in Geological and Environmental Sciences and may also indicate the following specialized fields of study: Geomathematics, Geostatistics in the Earth Sciences, and Hydrogeology.

The broad areas of faculty teaching and research are divided into three fields that have diploma designation and an additional six areas of specialization.

Admission—For admission to graduate work in the department, the applicant must have taken the Aptitude Test (verbal, quantitative, and analytical) of the Graduate Record Examination. In keeping with University policy, applicants whose first language is not English must submit TOEFL (Test of English as a Foreign Language) scores from a test taken within the last 18 months. Previously admitted students who wish to change their degree objective from M.S. to Ph.D. must petition the GES Admissions Committee.

**SCHOOL OF EARTH SCIENCES**

**COTERMINAL B.S./M.S. PROGRAM**

Hydrogeology—The Hydrogeology program, which leads to an M.S., Engineer, or Ph.D. degree in GES, balances research in the purely scientific and applied aspects of groundwater resources and near-surface processes. Key department faculty in hydrogeology are Professors Gorelick and Loague, but there are strong interactions with faculty in the departments of Civil and Environmental Engineering, Geophysics, and Petroleum Engineering and with scientists at the USGS. Investigations typically involve field sites and focus on topics ranging from understanding groundwater flow through large basins to optimal design of aquifer remediation strategies. The scales of interest extend from the domain of pores and fractures to vast regional flow systems. One important aim is to develop conceptual and quantitative predictive models. Such models enhance our understanding of the role of groundwater flow as a geologic process and provide means for evaluating and managing resources.

The program requires students to obtain a broad background in earth sciences and engineering. Students in the program must have a strong general scientific background in basic physics, chemistry, computer science, and mathematics, and a demonstrated aptitude for solving quantitative problems. They must complete a core curriculum involving courses in fluid mechanics, hydrogeology, hydrology, and water quality. A list of required and recommended courses is supplied upon request.

Geostatistics—The Geostatistics program, which leads to a M.S. or Ph.D. degree in GES, is under the direction of Professor Journel. It focuses on the probabilistic modeling of earth sciences phenomena such as oil reservoirs, ore deposits, and pollution sites in view of their development and management. As opposed to traditional mapping algorithms, stochastic imaging provides alternative, equiprobable, very high resolution numerical models of the phenomenon under study. These models integrate data from various sources such as well data, geophysical logs, and geological interpretation. Strong interactions have been developed with faculty and students in the departments of Geophysics and Petroleum Engineering.

The program requires a geological background and a fair level of calculus and programming (Fortran and/or C). Recent graduates have found jobs in the extractive (mining, oil) and environmental (EPA) fields.

Geomathematics—The Geomathematics program, under the direction of Professor Harbaugh, leads either to a M.S. or Ph.D. degree in GES. It focuses on the use of mathematics in simulating geologic processes in petroleum-bearing sedimentary basins. Geologic processes are represented in terms of their underlying physical principles by differential equations that have been placed in finite-difference form for numerical solution by computer. The numerical solutions are linked with graphics workstations to create dynamic three-dimensional displays, which are then used in simulating actual sedimentary basins.

Students in the program should have demonstrated aptitude for mathematics and computer programming. A list of required and recommended courses is supplied upon request.

**AREAS OF SPECIALIZATION**

Geochemistry, Petrology, and Mineralogy—The research and teaching interests of a number of the faculty in the Department of Geological and Environmental Sciences involve biogeochemistry, cosmochemistry, environmental geochemistry, geochronology and its applications in the atomic-level structure and properties of earth materials, hydrothermal systems, igneous and metamorphic petrology, mineralogy and mineral physics, mineral surface and colloid reactions, and ore deposits. Techniques include Ar-Ar, U-Pb, Sm-Nd, Rb-Sr, and U series geochronology; computer prediction and modeling; electron microprobe and sensitive high-resolution ion microprobe analysis; field-oriented studies; laboratory experiments at high temperatures and pressures on phase equilibria and mineral-fluid interactions; and x-ray scattering and spectroscopic studies of organic and inorganic earth materials. The scale of problems studied ranges from global to atomic. Students with strong backgrounds in chemistry are especially urged to contact faculty in these fields, including Professors Bird, Brown, Einaudi, Ernst, Fendorf, Ireland, Liou, Mahood, Matson, McWilliams, Moldovan, and Stebbins.
Structural Geology and Geomechanics (http://pangea.stanford.edu/geomech/index.html)—Research opportunities in this specialization include: engineering geology; geomechanics; hydraulics of faults and fractures; reservoir description and characterization; rock fracture and fault mechanics; and structural geology. Program advisers are Professors Aydin and Pollard. Correspondence with the advisers before application is suggested to clarify the nature and requirements of the program. Other faculty members with related research interests are: Professor Bird, Gorelick, Graham, Journel, Loague, Miller, and Moldovan (from GES); Professors Beroza, Klemperer, Makvo, Nur, Segall, and Zoback (from Geophysics); Professor Aziz, Durlovsky, Hewett, and Orr (from Petroleum Engineering); and Professor Borja (from Civil and Environmental Engineering).

One focus of the program is on characterizing and modeling physical processes responsible for geological structures. Topics include the evolution of crustal structures such as faults, folds, and fractures, and natural hazards related to earthquakes and volcanoes. Another focus is on the role of geologic structures (faults, folds, and fractures) in fluid flow in groundwater aquifers and petroleum reservoirs. This research is under the umbrella of the Rock Fracture Project, an industrial affiliates program.

The methodologies used in this program include field mapping of ancient or active structures; laboratory investigations using physical models; seismic mapping and interpretation of crustal subsurface structures; and theoretical analyses based on solid, fluid, and fracture mechanics. Research goals include delineating stress, strain, and displacement fields associated with geological structures at scales ranging from laboratory samples to plate boundaries, and understanding the geological and hydraulic properties of fractures and faults.

Sedimentary Geology, Paleoclimatology, Marine Geology, and Paleontology—Research in sedimentary geology at Stanford spans a wide range of specialized studies in modern and ancient settings. Sedimentary processes are studied at scales ranging from single sediment-gravity flows to the mechanisms by which continental margins form. Time-dependent phenomena are investigated at levels that range from the deposition and organic geochemical and paleoecological signatures of annually varved sediments to that of the fill of long-lived foreland basins. Venues span the globe from Asia, around the Pacific Rim to South America, and across to Africa in stratigraphic units that range from Archean to Recent; these are investigated with special focus on the tectonics, sedimentation, and paleoclimates of continental margins and sedimentary basins of the western U.S. These investigations employ the tools of many subdisciplines, including computer modeling/simulation, geochemistry, geochronology, micropaleontology, paleoecology, paleomagnetism, sedimentology, and seismic interpretation, with emphasis on interdisciplinary integration. Current projects include application of sedimentology to interpreting surface conditions and crustal evolution on the Archean earth, computer simulation of sediment flow and deposition, evolution of modern shallow carbonate depositional systems in the Gulf of California, organic geochemistry of paleoecological events such as El Niño, paleoecology and sedimentation of modern western Pacific marginal seas, research on the origins and evolution of sedimentary basins in Asia, sequence and seismic stratigraphic architecture of active margin basins, and sediment-gravity flow mechanisms and the structure of associated deposits. Core faculty are Dunbar, Graham, Ingle, Lowe, and Paytan; faculty with related or overlapping interests include Fendorf, Gorelick, Harbaugh, McWilliams, Miller, and Moldovan.

Structural Geology, Regional Geology, and Tectonics—Research in structural geology, regional geology, and tectonics overlaps the interests of many other research programs in the school and encompasses a broad spectrum of disciplines. Field-based studies address the evolution and deformation of continental crust and the relationship of plate tectonics to the genesis and evolution of mountain belts and sedimentary basins, with emphasis on the circum-Pacific region and North American Cordillera. The "AAR" and tectonics geochronology laboratories support studies aimed at understanding the thermal history of sedimentary basins and of igneous and metamorphic terranes, determining rates of geologic processes, and calibrating the geological and geomagnetic time scales. Geophysical studies include seismic imaging of the crust and mantle, stress and strain measurement in regions of active deformation, and paleomagnetic measurement of crustal deformation and continental accretion. Faculty with general interests in these topics include Professors Aydin, Ernst, Graham, McWilliams, Miller, and Pollard in Geological and Environmental Sciences, and Klemperer, Nur, Segall, Sleep, Thompson, and Zoback in Geophysics.

Surface and Aqueous Geochemistry—Professors Brown and Parks (emeritus) lead the Surface and Aqueous Geochemistry Group (SAAG) in the alteration and partitioning reactions that determine the mobility, bioavailability, and ultimate fate of solutes and contaminants in natural waters. Research focuses on the fundamental physical and surface/interfacial chemistry underlying reactions among water, aqueous solutes, and minerals under earth-surface conditions, and how the composition and structure of the solutions and mineral surfaces influence them. Students study speciation or complexation, dissolution, precipitation, and especially sorption reactions using a variety of classical surface chemistry and surface-sensitive spectroscopic methods, as well as computer simulations of the macroscopic and molecular-scale behavior of solutes and properties of solute-surface complexes. Results can be used to understand mechanisms of element partitioning and cycling in geochemical systems; they have applications in a wide variety of contexts including hazardous waste management, petroleum migration and recovery, remediation of contaminated sites, and weathering under the influence of acid rain.

SAAG students are expected to accumulate a sound background in physical and inorganic chemistry as well as geochemistry, and at least one field of application such as environmental engineering, environmental geosciences, or hydrogeology. Preference is given to applicants who have a strong quantitative background in chemistry and physical chemistry and experience with computers and laboratory methods.

Volcanology—Professors Aydin, Mahood, and Pollard have overlapping interests with Professors Segall and Zebker in Geophysics in the deformation of volcanic edifices; eruption triggers; explosive volcanism and emplacement of pyroclastic flows; formation of dikes, geologic evolution of caldera systems; magma degassing and impact of volcanic gases on the atmosphere; the physics of magma transport in the crust; magma reservoirs and sills; planetary volcanology; and seismic signatures of volcanic activity.

MASTER OF SCIENCE

Objectives—The purpose of the master’s program in Geological and Environmental Sciences is to continue a student’s training in one of a broad range of earth science disciplines and to prepare students for either a professional career or doctoral studies.

Procedures—The graduate coordinator of the department appoints an academic adviser during registration with appropriate consideration of the student’s background, interests, and professional goals. In consultation with the adviser, the student plans a program of course work for the first year. The student should select a thesis adviser within the first year of residence and submit to the thesis adviser a proposal for thesis research as soon as possible. The academic adviser supervises completion of the department requirements for the M.S. program (as outlined below) until the research proposal has been accepted; responsibility then passes to the thesis adviser. The student may change either thesis or academic advisers by mutual agreement and after approval of the graduate coordinator.

Requirements—The University’s requirements for M.S. degrees are outlined in the “Graduate Degrees” section of this bulletin. Practical training (GES 385) may be required by some programs, with adviser approval, depending on the background of the student. Additional department requirements include the following:

1. A minimum of 36 units of course work at the 100 level or above.
   a. Half of the courses used to satisfy the 36-unit requirement must be intended as being primarily for graduate students, usually at the 200 level or above.
   b. No more than 15 units of thesis research may be used to satisfy the 36-unit requirement.
c. Some students may be required to make up background deficiencies in addition to these basic requirements.

2. By the end of Winter Quarter of their first year in residence, students must complete at least three courses taught by a minimum of two different GES faculty members.

3. Each student must have a research adviser who is a faculty member in the department and is within the student’s thesis topic area or specialized area of study.

4. Each student must complete a thesis describing his or her research. Thesis research should begin during the first year of study at Stanford and should be completed before the end of the second year of residence.

5. Early during the thesis research period, and after consultation with the student, the thesis adviser appoints a second reader for the thesis, who must be approved by the graduate coordinator; the thesis adviser is the first reader. The two readers jointly determine whether the thesis is acceptable for the M.S. degree in the department.

DOCTOR OF PHILOSOPHY

Objectives—The Ph.D. is conferred upon candidates who have demonstrated substantial scholarship, high attainment in a particular field of knowledge, and the ability to conduct independent research. To this end, the objectives of the doctoral program are to enable students to develop the skills needed to conduct original investigations in a particular discipline or set of disciplines in the earth sciences, to interpret the results, and to present the data and conclusions in a publishable manner.

Requirements—The University’s requirements for the Ph.D. degree are outlined in the “Graduate Degrees” section of this bulletin. Practical training (GES 385) may be required by some programs, with adviser approval, depending on the background of the student. A summary of additional department requirements is presented below:

1. Ph.D. students must complete the required courses in their individual program or in their specialized area of study with a grade point average (GPA) of ‘B’ or higher, or demonstrate that they have completed the equivalents elsewhere. Ph.D. students must complete a minimum of four letter-grade courses of at least 3 units each from four different faculty members on the Academic Council in the University. By the end of Winter Quarter of their first year in residence, students must complete at least three courses taught by a minimum of two different GES faculty members.

2. Each student must qualify for candidacy for the Ph.D. by the end of the sixth quarter in residence, excluding summers. Department procedures require selection of a faculty thesis adviser, preparation of a written research proposal, approval of this proposal by the thesis adviser, selection of a committee for the Ph.D. qualifying examination, and approval of the membership by the graduate coordinator and chair of the department. The research examination consists of three parts: oral presentation of a research proposal, examination on the research proposal, and examination on subject matter relevant to the proposed research. The exam should be scheduled for prior to May 1, so that the outcome of the exam is known at the time of the annual spring evaluation of graduate students.

3. Upon qualifying for Ph.D. candidacy, the student and thesis adviser, who must be a department faculty member, choose a research committee that includes a minimum of two faculty members in the University in addition to the adviser. Annually, in the month of March or April, the candidate must organize a meeting of the research committee to present a brief progress report covering the past year.

4. Under the supervision of the research advisory committee, the candidate must prepare a doctoral dissertation that is a contribution to knowledge and is the result of independent research. The format of the dissertation must meet University guidelines. The student is strongly urged to prepare dissertation chapters that, in scientific content and format, are readily publishable.

5. The doctoral dissertation is defended in the University oral examination. The department appoints the research adviser and two other members of the research committee to be readers of the draft dissertation. The readers are charged to read the draft and to certify in writing to the department that it is adequate to serve as a basis for the University oral examination. Upon obtaining this written certification, the student is permitted to schedule the University oral examination.

Ph.D. MINOR

Candidates for the Ph.D. degree in other departments who wish to obtain a minor in Geological and Environmental Sciences must complete, with a GPA of ‘B’ or better, 20 units in the geosciences in lecture courses intended for graduate students. The selection of courses must be approved by the student’s GES adviser and the department chair.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

UNDERGRADUATE

1. Fundamentals of Geology—For non-majors or prospective majors in Earth Systems or Geological and Environmental Sciences. Introductions to and survey of the processes that shape the earth’s landforms, produce the minerals and rocks that comprise the earth, create soils, deform the earth’s crust, and move continents. Surficial processes involving water, wind, and ice, and their role in erosion and in the production of sediment. The processes acting within the earth’s interior, emphasizing global tectonics. How geologists determine the ages of rocks and geologic events. Geologic hazards: earthquakes, volcanic eruptions, flooding, landslides, and their mitigation. Nonrenewable resources, energy, environmental problems. Lectures, one all-day field trip, and weekly lab. Recommended: high school chemistry and physics. GER:2a (DR:5) 5 units, Aut (Mahood) Win (Ernst) Spr (Staff)

2. Earth History—For non-majors or prospective Earth Systems or geology majors. The earth is a dynamic planet, its surface continuously remodeled by changing patterns of plate movements, climatic variation, the rise and fall of sea level, mountain building, volcanism, erosion, and sedimentation. It has hosted an evolutionary parade of organisms, from self-replicating molecules to man, that have interacted with and strongly modified surrounding environments. The evolution of the earth and its biosphere, hydrosphere, and atmosphere represent active areas of current research and discussion. Topics: the formation of the earth, origin of life, evolution of the continents, oxygenation of the atmosphere, development of metazoans, history of glaciations and climate, the role of extraterrestrial events in geological and biological evolution. Non-required lab in GES 3 examines the materials and organisms discussed. Majors in geology must take 3 concurrently or in a subsequent year. $10 field trip fee required. GER:2a (DR:5) 3 units (Lowe) alternate years, given 2001-02

3. Earth History Laboratory—Introduction to the methods and materials of historical geology. Lab sessions on stratigraphic interpretation, geologic maps and cross sections, sedimentary environments, and metazoan evolution and fossils. Recommended for students taking GES 2;

3 units (Dunbar) alternate years, given 2001-02

42N. Stanford Introductory Seminar: Early Life on Earth—Preference to freshmen. An exploration of the first billion years of earth history, with emphasis on the environments, conditions, and processes that led to the origin of life on earth; the likelihood that life has evolved elsewhere in the solar system; examination and discussion of the geologic record of the oldest preserved life forms, and the environments in which they lived. Term paper. Use of Stanford’s of rock collection containing the oldest evidence for life on earth. GER:2a (DR:5)

3 units, Aut (Lowe) alternate years, not given 2001-02

43N. Stanford Introductory Seminar: Environmental Problems—Preference to freshmen. Groundwater contamination from point and nonpoint sources, cumulative watershed effects related to timber and mining practices, acid rain, subsurface disposal of nuclear waste, the Alaska pipeline, slope stability, and oil tanker spills.

3 units, Win (Loague)

44N. Stanford Introductory Seminar: Emerging Issues in Global Environmental Change—Preference to freshmen. Surveys the current understanding of environmental issues that are global in extent or effect, developing skills in searching primary literature and presenting the results of research in written and orally. Topics: atmospheric change, climate change, land use change, change in biotic resources, change in biogeochemistry, and the interaction of these changes with local and regional changes. Structure: six weeks of lecture/discussions focused on global changes and their causes and consequences at global and local scales; four weeks of oral presentations and discussions of student research. Team project exploring the social or natural science research in specific changes; students critique draft papers and give an oral presentation on their own research.

3 units (Matson) alternate years, given 2001-02

45N. Stanford Introductory Seminar: Environment Quality, is it Getting Better or Worse?—Preference given to freshmen. How do scientists address questions about environmental change? How do our governments set standards for environmental quality? What are some strategies for monitoring environmental quality? How can we distinguish between long term trends and random fluctuations? How can we predict the effects of national policy on environmental quality? What is the evidence for climate change over the past century? How do we predict the effects of climate change on society? The scientific tools and data needed to address these questions. Student pairs select a project area, assemble information, and provide oral progress reports and written final reports.

3 units, Win (Switzer) alternate years, not given 2001-02

46N. Stanford Introductory Seminar: The Beach—Preference to freshmen. Open coast beaches represent one of the most complex and dynamic natural environments of Earth; a triple point where the ocean, atmosphere, and continent meet and interact on time scales of seconds to millennia. The beach environment through lectures and reading, and by study in the field. Field work involves repeated measurement of waves, currents, and beach character and sample collection at sites from Point Reyes south to Monterey Bay, California, with the goals of assembling and analyzing a quantitative record of environmental change. Required papers on a specific aspect of the beach environment.

3 units (Ingle) alternate years, given 2001-02

47N. Stanford Introductory Seminar: “Secrets in the Mud”—A Look into the Field of Paleoenography—Preference to freshmen. The oceans have major effects on climate; understanding how the oceans operated and responded to natural perturbations in the past help us predict and plan for the potential consequences of changes humankind induces on the environment. The kinds of information deduced from marine sediments about Earth’s environment in the past. Student lab projects: sediment sample preparation and analysis, description and interpretation of data, and presentation as oral and written reports.

3 units, Win (Paytan) alternate years, not given 2001-02
48N. Stanford Introductory Seminar: Volcanoes of the Eastern Sierra Nevada—Preference to freshmen. Develop skills in researching primary sources in scientific literature and presenting the results of that research orally and in writing. Topics: young volcanoes, hot springs, earthquake faults, glacial features, paleoclimatology, and saline lakes of the eastern Sierra Nevada. Four-day field trip over the Memorial Day weekend. Term project is written as a chapter for a class-produced field trip guidebook. Students give an oral presentation on the outcrop at the field trip stop described in the guidebook chapter. Introduction to the basics of related geology. Camping and light hiking. GER: 2a (DR: 5)
3 units, Spr (Mahood) alternate years, not given 2001-02

49N. Stanford Introductory Seminar: Field Trip to Death Valley—Preference to freshmen. California's Death Valley and Owens Valley are natural laboratories for exploring a billion years of earth history: the sediments of ancient ocean's, large-scale crustal deformation and mountain building, recent earthquake faulting, and volcanic eruptions. Their desert environments reveal prehistoric climate changes and historic human impacts. Six-day field trip to these areas during Spring Break. Introduction to the basics of geology. Individual projects on specific topics are presented during the trip. Camping and moderate hiking required.
3 units, Win (Mahood, Miller)

50Q. Stanford Introductory Seminar: The Coastal Zone Environment—Preference to sophomores. The oceanographic, geological, and biological character of coastal zone environments, including continental shelves, estuaries, and coastal wetlands, with emphasis on San Francisco Bay. Five required field trips examine the estuarine and coastal environments of the Bay region, and agencies and facilities concerned with monitoring and management of these resources. Original research on a selected aspect of the coastal zone results in a written and oral report. Prerequisite: introductory course in the earth or biological sciences. GER:2a (DR:5)
3 units, Aut (Ingle)

52Q. Stanford Introductory Seminar: Geologic Development of California—Preference to sophomores, and to students who have completed introductory geology. Field-based, on the crustal evolution of California in post-Paleozoic time, and covering the geotectonic development of most of the state. Weekend field trips to the Diablo Range (two days); the central Klamath Mountains (three days); Point Lobos (one day); the White-Inyo Range, Owens Valley, and the eastern Sierra (three days). Camping and hiking.
4 units, Spr (Ernst)

53Q. Stanford Introductory Seminar: In the Beginning—Theories of the Origin of the Earth, Solar System, and Universe—Preference to sophomores. What happened in the first few seconds following the Big Bang? Where did all the elements in the periodic table come from? When and how did the Earth, Moon, and solar system form? When and where did life begin on Earth? Answers to these questions have been sought for centuries, and continues today. The history and evolution of theories of the origin of the Earth, Moon, solar system, and the Universe.
3 units, Win (McWilliams)

54Q. Stanford Introductory Seminar: California Landforms and Plate Tectonics—Preference to sophomores. The forces of plate tectonics at work on the landscape of California. The principles of rock deformation are introduced in hands-on experiments. Landforms resulting from deformation of the earth are analyzed with digital and photographic images. Field trips relate these large-scale structures to what one sees from the human perspective on the ground. Literature research on the tectonics of a region of the student’s choice. GER:2a (DR:5)
3 units, Aut (Miller)

55Q. Stanford Introductory Dialogue: The California Gold Rush—Geologic Background and Environmental Impact—Preference to sophomores, and to students who have completed introductory geology. The geologic processes that led to the concentration of gold in the river gravels and rocks of the Mother Lode region of California. The environmental impact of the Gold Rush population increase and of mining operations, including the effects of placer mining on the landscape, rivers, and fisheries, and the concentration of arsenic and mercury in surface sediments and soils due to hard rock mining and milling operations. Field trip to the Mother Lode region; term paper and oral presentation required.
2 units, Spr (Bird)

56Q. Stanford Introductory Dialogue: Change in the Coastal Ocean—The View from Monterey Bay—Preference to sophomores. The issue of recent changes in the California Current, using Monterey Bay as an example. Current literature is an introduction to several principles of oceanography. Visits from researchers from MBARI, Hopkins, and UCSC. Optional field trip to MBARI and Monterey Bay.
2 units, Spr (Dubar)

57Q. Stanford Introductory Seminar: How to Critically Read and Discuss Scientific Literature—Preference to sophomores. The ability to read and evaluate scientific primary literature is crucial for success in undergraduate or graduate school, or in the scientific work force. Topics: how to approach the reading of scientific articles, and how to understand and critically evaluate the information contained in them through guided and instructed reading, and a review of such papers.
3 units, Win (Paytan)

80. Earth Materials—Identification, classification, and interpretation of rock-forming minerals and the igneous, sedimentary, and metamorphic rocks they comprise. Rock cycles are related to earth systems. Lab work emphasizes use of the hand lens in making observations; overnight field trip demonstrates mineral and rock identification in the field, a variety of different pressure and temperature environments where minerals and rocks have formed, and genetic associations. Prerequisite: 1. Recommended: introductory chemistry.
5 units, Aut (Brown, Liou)

81. Petrography Tutorial—Practice in identifying minerals and rocks using a petrographic microscope. One three-hour lab per week. Prerequisite: 80 or equivalent.
2 units, Spr (Miller, Staff)

90. Introduction to Geochemistry—Introduction to the chemistry of the solid earth and its atmosphere and oceans, emphasizing the processes that control the distribution of the elements in the earth over geological time and at present, and on the conceptual and analytical tools needed to explore these questions. The basics of geochemical thermodynamics and isotope geochemistry. The formation of the elements, crust, atmosphere and oceans, global geochemical cycles, and the interaction of geochemistry, biological evolution, and climate. Recommended: introductory chemistry.
3 units, Win (Stebbins)

102. Introduction to Field Geology—Instruction and practice in the basic methods of geologic investigation in the field. Emphasis is on techniques of systematic observations and the construction of geologic maps and sections from the data obtained with a written geologic report on one of the study areas. Field area sites display a variety of rock types and landforms related to clearly defined geologic structures and events. Conducted from White Mountains Research Station in Bishop, CA for the two weeks preceding the beginning of Autumn Quarter. ContactGES, or see Summer Session Catalogue for schedule. Prerequisites: 1, 80.
3 units, Sum (Ruetz)

105. Geologic and Environmental Problems—Supervised reading, field and/or lab work; written reports thereon.
1-10 units, any quarter (Staff)
110. Structural Geology: Introduction to Deformation in the Earth’s Crust—The basic theory, principles, and techniques used to interpret and measure structures in naturally deformed rocks. Topics: the properties, rheology, and mechanisms of the deformation of rocks and minerals; techniques of data collection in the field; lab and computer analysis of structural data; geometry and development of faults and folds; interpretation of geologic maps and construction of geologic cross-sections; strain measurement and structural analysis of metamorphic tectonites; the evolution of mountain belts, formation of rift-related sedimentary basins, and development of strike-slip fault systems. Prerequisites: 1, calculus. Recommended: 80, 102. (WIM) 
5 units, Spr (Miller)

111. Structural Geology and Rock Mechanics—(Same as Civil and Environmental Engineering 195.) Observational techniques, analysis methods, and the theoretical foundations of structural geology, engineering geology, and rock mechanics. Computer exercises are integrated with field data to understand the role of geologic structures in the evolution of the earth’s crust (folding, faulting, flow, and fracturing of rock) and geologic hazards (earthquakes, landslides, and volcanoes). Topics: structural quantities and dimensional analysis; use of stress, strain, displacement, and velocity fields in structural analysis; the concept and measurement of deformation; mechanical properties of rock (elasticity, viscosity, stress, strength, fracture toughness); case studies of typical geologic structures using continuum mechanics. Computer labs. Prerequisites: 1, calculus, Macintosh skills. 
5 units, Aut (Pollard)

112. Mapping the Geological Environment—Introduction to modern techniques for the mapping and measurement of geological features associated with natural resources recovery, geological hazards, and environmental problems. Use of descriptive geometry and stereographic projections to analyze geological field data. Total Positioning System (TPS) and the satellite-based Global Positioning System (GPS) are used for field data acquisition. Compilation, visualization, and presentation of 2D and 3D field data is implemented using computer graphics applications and Geographic Information Systems (GIS). Field trips. (WIM) 
4 units, Spr (Einaudi, Pollard)

115. Engineering Geology Practice—(Same as Civil and Environmental Engineering 196.) The application of geologic fundamentals to the planning and design of civil engineering projects. Emphasis is on the development of geologic skills to identify, describe, and map earth materials and geologic structures as a means of determining the impact on site development. Topics: weathering and soil-forming processes, soil and rock mechanics, site investigation techniques, surface and groundwater regimes, stream and coastal processes, quaternary tectonics, deposits and geomorphology, environmental concerns, and geologic and geotechnical hazards. Field/lab exercises and case history studies emphasize the impact of site geology on the safe planning, design, and construction of civil engineering projects such as foundations, transportation facilities, excavations, tunnels and underground storage space, water supply facilities, and marine works. Prerequisite: 111 or consent of instructor. 
3 units (Holzer) alternate years, not given 2001-02

120. Geosphere—(Same as Earth Systems 110.) Geological processes, from local to global, affect people and civilization. The reverse is also true; civilization is beginning to influence the geosphere. The processes experienced at the earth’s surface (catastrophic earthquakes, volcanic eruptions, and longer term atmospheric and climate changes) are linked to what goes on in the earth’s deep interior. How geochemical, geophysical, and biological processes interact over time scales ranging from 4.5 billion years to the nearly instantaneous? Topics: the origin and evolution of the atmosphere and oceans, heat flow and global tectonics and how they have changed over time, geochemical cycles, climate change, catastrophic impacts, and the roles played by organisms. Prerequisite: 1 or 2. 
3 units, Aut (Paytan, Siebbins, McWilliams)

133. Introduction to Assessment of Environmental Risk—Interdisciplinary approach to evaluate environmental and natural hazard risks, combining economics with earth-science information. The earth sciences, applied statistics, geographic information systems (GIS) and microeconomics are integrated in a decision framework (cost-benefit analysis) to address site-specific issues (e.g., locating a waste-disposal facility), and regional issues (e.g., reducing earthquake-related damage). Techniques developed are applied in an in-class bargaining exercise to evaluate a current land-use issue. Prerequisite: 160 or equivalent, or consent of instructor. 
3 units, Win (Bernknopf)

140. Geomorphology—Focus is on the materials and surface/near-surface processes of fluvial landscapes. Topics: hillslope hydrology, weathering of rocks and soils, erosion, sediment transport, flow failures, mass wasting, and conceptual models of landscape evolution. Prerequisite: 1. Recommended: 151. (WIM) 
3 units, Win (Loague) alternate years, not given 2001-02

147. Controlling Climate Change in the 21st Century—(Enroll in Human Biology 147.) 
3 units, Aut (Schneider, Rosencranz)

151. Sedimentary Geology and Petrography: Depositional Systems—Topics: weathering, erosion and transportation, deposition, the origins of sedimentary structures and textures, sediment composition, diagenesis, sedimentary facies, tectonics and sedimentation, and the characteristics of the major siliciclastic and carbonate depositional environments. Lab: methods of analysis of sediments in hand specimen and thin section. 
Field trips required. Prerequisites: 1, 2. (WIM) 
4 units, Win (Lowe, Graham)

152. Stratigraphy and Applied Paleontology—The rudiments of interpreting sedimentary sequences. Emphasis is on the integration of paleontologic and sedimentologic evidence to reconstruct depositional environments, basin history, and paleogeographic and paleo-oceanographic settings. The nature of the fossil record, the use of fossils for dating, correlation, and paleo-environmental and paleo-oceanographic reconstructions. Characteristic variations of modern and ancient biofacies and lithofacies. Biostatigraphy, magnetostratigraphy, and radiometric dating and correlation. Term paper. Lectures supplemented by classic and current scientific literature. Weekly lab; two required field trips. Prerequisites: 1, 2. (WIM) 
4 units, Spr (Ingle)

159. Marine Chemistry—(Same as Earth Systems 159.) For upper-division undergraduates and graduate students in the earth, biology, and environmental sciences. The oceans are in interactive contact with the atmosphere, biosphere, and lithosphere, and virtually all elements pass through the ocean at some point in their cycles. The first-order processes take place within the sea, which affects its chemistry. What controls the distribution of chemical species in water and sediments? How long do different elements spend, on average, in the ocean? How do marine chemical processes interact with the biological, geological, and physical processes in the oceans? Prerequisite: 8 or the consent of the instructor. 
3 units, Spr (Paytan)

160. Introduction to Statistical Methods for Earth and Environmental Sciences—Data summaries, graphical display of data, measures of association sampling, quantification of uncertainty, statistical models, testing, and prediction. Analysis of spatial and temporal data. Examples from geologic and environmental science. 
4 units, Spr (Switzer)

163. Introduction to Isotope Geology—Introduces the use of stable and radiogenic isotopes in earth and planetary sciences; intended as a foundation for 164 and/or 165. Basic cosmochemistry and nucleosynthesis: the origin, abundance, and distribution of the elements in the solar system; factors that control elemental abundance and distribution; iso-
Stable Isotopes—Light stable isotopes and their application to geological and geophysical problems. Isotopic systematics of hydrogen, carbon, nitrogen, oxygen, and sulfur; chemical and biogenic fractionation of light isotopes in the atmosphere, hydrosphere, and in minerals. Isotopic composition of water in the oceans. Paleothermometry and paleoclimatology. Isotope fractionation in igneous, sedimentary, and metamorphic rocks, and in ore-forming fluids. Prerequisite: 163 or consent of the instructor.

3 units (Dunbar) alternate years, given 2001-02

165. Geochronology—The principles of geochronology and thermochronology and their application to geological and geophysical problems. Topics: nuclear structure, isotope systematics, decay schemes for the principal nuclides used in earth sciences, equilibrium and disequilibrium, diffusion and transport phenomena, blocking (closure) of isotopic and magnetic systems, creation and annealing of fission tracks, neutron activation, a review of geologic timescales, chronostatigraphy, magnetostratigraphy, and cosmogenic exposure ages. Alpha counting, mass spectrometry by gas source, solid source, ion probe and accelerator methods. Fundamentals of K-Ar, Ar-Ar, Rb-Sr, U-Pb fission track and cosmogenic isotope methods. Recommended: undergraduate training in calculus, chemistry, geology, and physics.

3 units (McWilliams)

166. Soil Chemistry—Practical and quantitative treatment of soil processes affecting chemical reactivity, transformation, retention, and bioavailability. The three primary areas of soil chemistry: inorganic and organic soil components, complex equilibrium in soil solutions, and adsorption phenomena at the solid-water interface. The special considerations required for acid, saline, and wetland soils.

3 units, Win (Fendorf)

170. Environmental Geochemistry—Introduction to the solid, aqueous, and gaseous phases comprising the environment, their natural compositional variations, and their chemical interactions, emphasizing the contrast between natural sources of hazardous elements and compounds and the types and sources of anthropogenic contaminants and pollutants. Identification of chemical and physical processes that result in weathering and soil formation. Chemical factors that affect the stability of solids and aqueous species under earth surface conditions. Emphasis is on processes that control the release, mobility, and fate of contaminants in natural waters and the role of water and dissolved substances play in the physical behavior of rocks and soils. The scientific basis for evaluation of the impact of contaminant and the design of remediation strategies. Case studies: mercury on the San Francisco Peninsula, heavy metals in the Sierra Nevada and Central Valley of California, and high-level radioactive waste disposal sites in the U.S. Prerequisite: 90 or consent of instructor.

4 units, Win (Brown)

171. Geochemical Thermodynamics—Introduction to the application of chemical principles and concepts to geologic systems. The chemical behavior of fluids, minerals, and gases using simple equilibrium approaches to modeling the geochemical consequences of diagenetic, hydrothermal, metamorphic, and igneous processes. Topics: reversible thermodynamics, solution chemistry, mineral-solution equilibria, reaction kinetics, and the distribution and transport of elements by geologic processes. Prerequisite: 80.

3 units, Aut (Bird)

175. Science of Soils—The physical, chemical, and biological processes that occur within soil systems. The factors governing nutrient availability, plant growth/production, land-resource management, and pollution within soils.

3 units, Aut (McWilliams)

181. Igneous and Metamorphic Processes—The origin of igneous and metamorphic rocks, emphasizing magmatic differentiation and subsolidus recrystallization processes and their imposed physio-chemical and tectonic conditions. The physical properties of magmas, role of volatile components, applications of trace elements and isotopes to igneous processes, geodynamics, and evolution of the crust-mantle system modeling of crystal fractionation and partial melting, relevant experimental data and phase diagrams, and relations of magma types to tectonic settings. Mineral paragenesis, phase relations, metamorphic reactions, fluid/rock interactions, P-T-time paths and their imposed tectonic settings. Lab hand-specimen and petrographic examinations of suites of igneous and metamorphic rocks. Graduate students may take without lab for 3 units. Prerequisites: 80, 90, or equivalents.

3 or 5 units (Liou) alternate years, given 2001-02

182. Field Seminar on Continental-Margin Volcanism—For juniors, seniors, and graduate students in the earth sciences and archeology. Three weekend-long field trips to study Cenozoic volcanism associated with subduction and with passage of the Mendocino Triple Junction off the west coast of California: Mt. Lassen/Mt. Shasta/Madoc; Clear Lake/Sonoma Volcanics; Pinnacles National Monument. Features visited and studied: andesite and basalt lavas, cinder cones, mixed magmas, blast deposit, debris avalanches, volcanic mudflows, hydrogeologic controls of springs in volcanic terrains, hydrothermal alteration and modern geothermal systems. Hg mineralization, obsidian source. Prep lectures, reading assignments, and video-viewing assignments. Light hiking and camping required. Prerequisite: 1 or equivalent.

2 units (Mahood) alternate years, given 2001-02

184. Field Seminar on Eastern Sierran Volcanism—For juniors, seniors, and graduate students in the earth sciences and archeology. Five-day trip over Memorial Day weekend to study silicic and mafic volcanism associated with the western margin of the Basin and Range province. The basaltic lavas and cinder cones erupted along normal faults bounding Owens Valley. Long Valley caldera-lake sedimentation, postcaldera rhyolite lavas, hydrothermal alteration, and hot springs. The holocene rhyolite lavas of the Inyo and Mono Craters. Volcanism of the Mono Basin with subaqueous basaltic eruptions, floating pumice blocks, and cryptodomes punching up lake sediments. If snow-level permits, silicic volcanism associated with the Bodie gold district. Prep lectures, reading assignments, and video-viewing assignments. Prerequisite: 1 or equivalent.

2 units (Mahood) alternate years, given 2001-02

185. Volcanology—For juniors, seniors, and beginning graduate students in all the earth sciences. Eruptive mechanisms; models of the emplacement of pyroclastic flows and characteristics of resulting deposits; volcanic landforms and their relation to the composition and physical properties of magmas; calderas; volcanic gases; volcanic hazards and the effects of facies models for volcanic centers eruptions on climate and the atmosphere; volcanic-hosted geothermal systems and mineral resources. One four-day field trip over Memorial Day weekend required. Prerequisite: 1 or equivalent. (WIM)

4 units, Spr (Mahood) alternate years, not given 2001-02

185L. Volcanology Laboratory—Hand sample and petrographic microscope examination of volcanic rocks. Labs keyed to 185 lectures taken concurrently. Prerequisite: some experience with a petrographic microscope.

1 unit (Mahood) alternate years, not given 2001-02
187. Introduction to Ore Deposits—The geology of hydrothermal systems, their products and processes: chemical, fluid inclusion, and isotopic characterization of fractures/veins and altered rocks, mineralogical and structural; distribution, geologic settings, and temporal evolution; and general models and interpretation of metasomatic processes. Focus is on understanding active hydrothermal systems in continental and oceanic settings and applications to ancient analogues: hot springs and mercury deposits, geothermal reservoirs and gold-silver deposits, volcanic fumaroles and magmatic-hydrothermal systems, mid-ocean-ridge hot springs and submarine massive sulfide deposits, and sedimentary basin brines and stratabound sulfide deposits. Lab: methods of study and description of veins and altered rocks; introduction to fluid inclusion microthermometry. Field trips required. Prerequisites: 80, 90.

4 units (Einaudi) alternate years, not given 2001-02

190. WIM Project—Students in a GES WIM (110, 112, 151, 152 or 185), enroll in 190 using the section # of the appropriate faculty member.

1 unit (Staff)

192. Special Projects in Geological and Environmental Sciences—Supervised reading, field, and/or lab research with written reports. 1-10 units, any quarter (Staff)

195. Integrating Remote Sensing and Geographic Information Systems (GIS)—Entry-level survey of remote sensing and GIS; weekly computer-based lab session involving both subjects, stressing the interrelationships of the information from remotely sensed environmental data with the techniques and methodology of GIS. Lab enrollment limited to 20.

3 units, Aut (Staff)

196. Introduction to GIS: ARC/Info and Arc-View—(Graduate students enroll in 296; same as Geophysics 196.) Hands-on experience with ESRI's ARC/INFO or Arc-View commercial GIS packages. Topics: setting up geographic databases and manipulating spatial data, including database query and analysis. Hands-on computer-based exercises using sample ARC datasets on workstations. Guest lectures on GIS applications in the environmental, geological, and biological sciences, and in town planning. Students unable to register for 196 may sign up, with consent of instructor, for a self-paced computer tutorial version in 197, any quarter.

2 units, Win (Klemperer)

197. Research in the Application of Geographic Information Systems (GIS)—Supervised reading, field, and/or lab research with written reports. 1-5 units, Aut, Win, Spr (Klemperer)

198. Special Problems in Geological and Environmental Sciences—Supervised reading, field, and/or lab research with written reports. 1-10 units, any quarter (Staff)

199. Honors Program—Research on a topic of special interest. See "Undergraduate Honors Program" above.

3 units, Aut, Win, Spr, Sun (Staff)

GRADUATE

200. Issues in Geoscience Education

1 unit, Aut, Win, Spr (Staff)

202. Reservoir Geomechanics—(Enroll in Geophysics 202.)

3 units, Win (Zoback)

205. Advanced Oceanography—For upper-division undergraduates and graduate students. Topics vary each year following or anticipating research trends in oceanographic research. Focus is on links between the circulation and physics of the ocean with climate in the North Pacific region, and marine ecologic responses. Lectures/discussion, with participation by marine scientists from various marine research groups and organizations including the Monterey Bay Aquarium Research Institute.

3 units (Dunbar) alternate years, given 2001-02

206. Antarctic Marine Geology—For upper-division undergraduates and graduate students. Intermediate and advanced topics in marine geology and geophysics, focusing on examples from the Antarctic continental margin and adjacent Southern Ocean. Topics: glaciers, icebergs, and sea ice as geologic agents (glacial and glacial marine sediments, modern particulate sediments, Antarctic biomineralization and chronostatigraphy (continental margin evolution). Students interpret seismic lines and sediment core/well log data. Examples from a recent scientific drilling expedition to Prydz Bay, Antarctica. Up to two students may have an opportunity to study at sea in Antarctica during Winter Quarter.

3 units, Aut (Dunbar, Cooper)

210. Geologic Evolution of the Western U.S. Cordillera—For undergraduates and graduates. Overview of the geology of the western states. The evolution of the mountain belt from its inception in the Precambrian to its contemporary history of extension and strike-slip faulting, based on the description, analysis, and interpretation of the rock record through time. The characteristic structural styles developed during crustal shortening, extension, and strike-slip tectonic regimes; tectonic controls on sedimentary basin formation; plate margin magmatism and metamorphism; and the relation of plate motions to the land geologic record provide insight into the crustal-scale processes and driving mechanisms common to mountain chains.

2-3 units (Miller) alternate years, given 2001-02

211. Topics in Regional Geology and Tectonics—Seminar.

2 units, Win (Miller)

215. Advanced Structural Geology and Rock Mechanics—(Same as Geophysics 215.) The observational techniques, analysis methods, and theoretical foundations of structural geology, engineering geology, and rock mechanics. Computer exercises are integrated with field data to understand the role of geologic structures in the evolution of the earth's crust (folding, faulting, flow, and fracturing of rock) and geologic hazards (earthquakes and volcanoes). Topics: structural quantities and dimensional analysis; use of stress, strain, displacement, and velocity fields in structural analysis; concept and measurement of deformation; mechanical properties of rock (elasticity, viscosity, strength, friction, fracture toughness); case studies of typical geologic structures using continuum mechanics. Computer labs.

5 units, Aut (Pollard)

216. Rock Fracture Mechanics—(Same as Geophysics 216.) Theoretical and experimental principles of continuum and fracture mechanics are applied to the origin and physical behavior of faults, dikes, joints, veins, solution surfaces, and other natural structures in rock. Field observations, engineering rock fracture mechanics, and the elastic theory of cracks. The role of natural fractures in brittle rock deformation, fluid flow, and heat transport in the earth's crust with applications to crustal deformation and tectonophysics, structural geology, petroleum geology and engineering, and hydrogeology. Prerequisite: 215 or equivalent.

5 units (Pollard) alternate years, given 2001-02

217. Characterization and Hydraulics of Rock Fractures—Interdisciplinary survey of natural fractures (faults, joints, veins, and solution seams) and their geological, geophysical, geomechanical, stochastic, and hydraulic properties. Case studies of fracture characterization experiments and problems related to fluid flow in aquifers, oil and gas reservoirs, and waste repository sites in fractured rock. Invited lecturers from various disciplines and one weekend field trip. Prerequisite: equivalent of first-year graduate student in Geological and Environmental Sciences, Geophysics, or Petroleum Engineering.

3 units (Aydin) alternate years, given 2001-02
219. Paleooceanography—For upper-division undergraduates and graduate students in the earth, biology, and environmental sciences. How can we learn about the chemistry, circulation, biology, and geology of past oceans and why is this of interest? Evidence for substantial changes in earth's climate and surficial environment is contained in the sedimentary record. The fundamentals of gathering and interpreting this information in the context of understanding how earth processes functioned in the past and their relevance for the habitability of our planet in the future.

3 units, Aut (Paytan)

220. Terrestrial Biogeochemistry—For upper-division undergraduates and graduate students in the earth and biological sciences. The processes by which components of terrestrial ecosystems interact, drawing on areas of geology, soil science, hydrology, chemistry, biology, and ecology, and emphasizing nutrient cycling.

3 units (Matson, Vitousek) alternate years, given 2001-02

221. The Origins of Life in the Solar System—Interdisciplinary seminar for upper-division undergraduates and graduate students in the physical and biological sciences. Current topics in exobiology and the origins of life from a planetary sciences perspective. Definitions of life and the origin of information; water, carbon, and energy; phylogenetic and fossil inferences about early life on Earth; the early terrestrial environment, including asteroid and comet impacts; prebiotic organic syntheses and the RNA world; panspermia; the search for life on Mars; Europa, including prospects for an ocean and speculative ecologies; upcoming spacecraft missions and mission planning; planetary protection, back contamination, and legal and ethical issues; and student-suggested topics. Student presentations, group discussion, and lectures.

3 units, Spr (Chyba)

222. Seminar in Sustainable Agriculture—(Same as Earth Systems 222.) For upper-division undergraduates and graduate students in the earth and biological sciences.

2-3 units (Matson, Naylor) alternate years, given 2001-02

223. Isotopes in Geological and Environmental Research—For upper-division undergraduates and graduate students in the earth, biology, and environmental sciences. The applications of different isotopic systems in geological, oceanographic and environmental studies at low temperature. The use of isotopes as tracers for weathering rate, biogeochemical cycling, food-web structures, ecology, paleo-chemistry, provenance, circulation, anthropogenic and extraterrestrial inputs, etc. Isotopic systems: S, Sr, Nd, Ra, Os, B, Th, Pb, Ca, Se, Si, He, Be, and Fe. Emphasis is on developing skills in reading and evaluation of scientific papers, preparing oral presentations, conducting literature searches, manuscript reviews, and proposal preparation. Prerequisite: 163, 164, or consent of the instructor.

3 units (Paytan) alternate years, given 2001-02

230. Physical Hydrogeology—(Same as Civil and Environmental Engineering 260A.) Theory of underground water, analysis of field data and pumping tests, geologic groundwater environments, solution of field problems, groundwater modeling. Introduction to groundwater contaminant transport and unsaturated flow. Lab. Prerequisite: elementary calculus.

5 units, Aut (Gorelick)


4 units, Spr (Gorelick)

235. Role of Fluids in Geologic Processes—The principles governing groundwater flow and its interaction with crustal stress, heat flow, and chemical mass transport. Topography-driven flow of groundwater on a regional scale; compaction-driven flow in the sedimentary basin; development of anomalous fluid pressure; the role of fluid in tectonism; migration and entrainment of petroleum; density driven flow and thermal anomaly; formation of mineral deposits. Prerequisite: 230.

3 units, Spr (Hsieh) alternate years, not given 2001-02


4 units (Loague) alternate years, given 2001-02


4 units (Loague) alternate years, given 2001-02

238. Soil Physics—Advanced level, focusing on the physical and chemical properties of the soil solid phase, with emphasis on the transport, retention, and transformation of water, heat, gases, and solutes in the unsaturated subsurface. Agricultural systems. Field techniques and classic experiments demonstrated and reproduced in the lab. Prerequisite: elementary calculus.

4 units, Aut (Loague) alternate years, not given 2001-02


3 units (Loague) alternate years, given 2001-02

240. Geostatistics for Spatial Phenomena—(Same as Petroleum Engineering 240.) Probabilistic modeling of spatial and/or time dependent phenomena. Kriging and cokriging for gridding and spatial interpolation. Integration of heterogeneous sources of information. Stochastic imaging of reservoir/field heterogeneities. Introduction to GSLIB software. Case studies from the oil and mining industry and environmental sciences. Prerequisites: introductory calculus and linear algebra, Statistics 116 or equivalent.

3-4 units, Win (Caers)

241. Practice of Geostatistics and Seismic Data Integration—(Same as Petroleum Engineering 241.) Students build a synthetic 3D fluvial channel reservoir model with layer depths, channel geometry, and facies-specific petrophysical and seismic properties, stressing the physical significance of geophysical data. Reference data set is sparsely sampled providing the sample data typically available for an actual reservoir assessment. Geostatistical reservoir modeling uses well and seismic data, with results checked against the reference data base. All software provided (GSLIB and SROTools). Recommended: basic prior experience with Unix, Matlab/Fortran programming. Prerequisite: 240.

3-4 units, Spr (Caers, Mukerji)

242A. Topics in Advanced Geostatistics—(Same as Petroleum Engineering 242.) Conditional expectation theory and projections in Hilbert spaces; parametric vs. non-parametric geostatistics; Boolean, Gaussian,
fractal, indicator, annealing approaches to stochastic imaging; multiple
point statistics inference and reproduction; neural net geostatistics;
Bayesian methods for data integration; techniques for upscaling hydro-
dynamic properties. May be repeated for credit. Prerequisites: 240,
advanced calculus, Fortran/Unix.

246. Reservoir Characterization and Flow Modeling with Outcrop Data—(Same as Petroleum Engineering 246.) Project provides earth
science students with an understanding of how to use outcrop observa-
tions in quantitative geological modeling and flow simulation, and
addresses a specific reservoir management problem by studying a
suitable outcrop analogue (weekend field trip), constructing geostatisti-
cal reservoir models, and performing flow simulation. An introduction,
through an applied example, to the relationship between the different
disciplines. A different reservoir management question and outcrop
analogue is studied each year.

3 units, Aut (Journel) alternate years, not given 2001-02

249. Biological Markers—The basic atomic building block for life as
we know it is carbon. Biological markers (molecular fossils, biomarkers)
are known from the Archean to the Present as biologically derived carbon
compounds that provide information on the paleoenvironment, geologic
age and stratigraphy, thermal maturity, and diageneis of sediments,
rocks, and petroleum. Biomarker “fingerprints” are useful to monitor and
determine the environmental fate of petroleum and to understand and
map petroleum systems. They are key biogeochemical proxies for
monitoring, discovering, and explaining paleoenvironmental conditions
and changes. Recently, they have been a focus in the search for extrater-
restrial life. The fundamentals to understanding, interpreting, and apply-
ing biomarkers and their “fingerprints.”

2-3 units, Aut (Moldowan)

250. Sedimentation Mechanics—The mechanics of sediment transport
and deposition and the origins of sedimentary structures and textures as
applied to interpreting ancient rock sequences. Dimensional analysis,
fluid flow, drag, boundary layers, open channel flow, particle settling,
erosion, sediment transport, sediment gravity flows, soft sediment defor-
mation, and fluid escape. Field trip required.

3 units (Lowe) alternate years, given 2001-02

251. Sedimentary Basins—Analysis of the depositional framework and
tectonic evolution of sedimentary basins. Topics: tectonic and environ-
mental controls on facies relations, synthesis of basin development
through time in terms of depositional systems and tectonic settings.
Weekend field trip required. Prerequisites: 110, 151.

3 units (Graham) alternate years, given 2001-02

252. Sedimentary Petrography—Examination/interpretation of silici-
clastic sediments and sedimentary rocks. Lectures/readings stress re-
search in modern sedimentary mineralogy and petrography and the
relationship between the composition and texture of sediments and their
provenance, tectonic settings, and diageneric histories. Class is topical
and varies yearly. Prerequisite: 151 or equivalent.

4 units (Lowe) alternate years, not given 2001-02

253. Petroleum Geology and Exploration—The basics of petroleum
geology. The origin, occurrence, and exploration for hydrocarbons.
Topics: thermal maturation history in hydrocarbon generation, signifi-
cance of sedimentary and tectonic structural setting, principles of accum-
ulation, geological and geophysical exploration techniques. Prerequi-
sites: 110, 151. Recommended: Geophysics 183.

3 units (Graham) alternate years, given 2001-02

254. Advanced Paleoenography—Paleochemistry and paleocircula-
tion of the oceans as deduced from the study of marine sediments.

3 units (Dunbar) alternate years, given 2001-02

255. Introduction to Micropaleontology—Microscopic marine foss-
sils, including diatoms, ostracods, and radiolarians, with emphasis on
foraminifera. The principles of classification, evolutionary trends, com-
mon genera, ecology, and environmental distribution of foraminifera.
Application of planktonic and benthic foraminifera to interpretation of
paleoenvironments, paleoceanographic and paleoclimatic analysis, and
correlation of marine sequences. Paleoenvironmental and age analysis of
an unknown microfossil sample serves as a term research project. Lab on
microfossil groups.

5 units (Ingles) alternate years, given 2001-02

256. Advanced Micropaleontology—The use of marine microfossils
(mainly benthic and planktonic foraminifera) to solve fundamental
geologic and oceanographic problems. Applications to geochronology,
correlation, paleoecology, and paleoceanography. Individual analysis of
a series of unknown samples provides intensive experience in applying
basic concepts of biostratigraphy and paleoenvironmental analysis to
interpretation of Paleozoic, Mesozoic, and Cenozoic microfossil assem-
bles. Lectures on classic and current examples of research in this field.
Prerequisite: 255.

3 units (Ingles) alternate years, given 2001-02

257. Climate Variability and Forcing Mechanisms of the Last 10,000
Years: Implications for Life in the 21st Century—Open to graduate
students and seniors in the earth sciences, earth systems, ecology, and
anthropology. Overview of large-scale features of the climate systems
that control interannual variability in temperature and rainfall. Recent
studies in climate reconstruction and the influence of climate change on
man. Lectures/readings and discussions.

3 units (Dunbar) alternate years, given 2001-02

258. Introduction to Depositional Systems—The characteristics of the
major sedimentary environments and their deposits in the geologic
record, including alluvial fans, braided and meandering rivers, aeolian
systems, deltas, open coasts, barred coasts, marine shelves, and deep-
water systems. Emphasis is on subdivisions; morphology; the dynamics
of modern systems; and the architectural organization and sedimentary
structures, textures, and biological components of ancient deposits.

3 units (Lowe) given 2001-02

260. Laboratory Methods in Organic Geochemistry—Organic mate-
rials in the Earth and its surface environments generally occur as complex
mixtures. Detailed knowledge of specific components in geochemical
mixtures is useful to understand geological and environmental samples.
The presence and relative abundance of these compounds provides
information on the biological source, depositional environment, burial
history, biodegradation, and toxicity of organic materials. Laboratory
methods detect and quantify various components of these mixtures. The
lab provides a basic understanding and hands-on experience of methods
used for the separation and detailed analysis of organic compounds in
geologic samples: extraction, liquid chromatography, absorption by
zeolites, gas chromatography and gas chromatography-mass spectrom-
etry. Student samples are considered as material for analysis. Recom-
mended: 249.

2-3 units, Win, Spr (Moldowan)

261. Physics and Chemistry of Minerals and Mineral Surfaces—The
interaction of x-rays with solids and liquids (scattering and spectros-
cyopy); crystal chemistry and bonding in solids and their relative stability;
the interaction of x-rays with solids and liquids (scattering and spectros-
cyopy); structural variations in silicate glasses and liquids; UV-visible
spectroscopy and the color of minerals; review of the mineralogy, crystal
chemistry, and structures of selected rock-forming silicates and oxides;
mineral surface and interface geochemistry.

4 units (Brown) alternate years, given 2001-02

262. Thermodynamics and Disorder in Minerals and Melts—The
thermodynamic properties of crystalline, glassy, and molten silicates and
oxides in light of microscopic information about short range structure and ordering. Measurements of bulk properties, e.g., enthalpy, density, and their pressure and temperature derivatives, and structural determination by spectroscopies such as Nuclear Magnetic Resonance and Mössbauer. Basic formulations for configurational entropy, heats of mixing in solid solutions, activities; and the energetics of exsolution, phase transitions, and nucleation. Quantitative models of silicate melt thermodynamics are related to atomic-scale views of structure. A general view of geothermometry and geobarometry. Prerequisites: introductory mineralogy and thermodynamics.

3 units (Stebbins) alternate years, not given 2001-02

264. Low Temperature Aqueous Geochemistry—(Same as Civil and Environmental Engineering 273.) Chemical principles and their application to the analysis and solution of problems in aqueous geochemistry (temperatures near 25°C and atmospheric pressure). Emphasis is on the analysis of natural water systems and the understanding and solution of specific chemical problems in water purification technology and water pollution control. Prerequisites: Chemistry 31 and 33, or equivalents.

3 units, Aut (Leckie)

265. Soil Chemical Dynamics—Chemical and biologically mediated chemical processes within soils and surface waters; emphasis is on oxidation-reduction reactions and processes at the solid-water interface. Topics: electron transfer processes, dissimilatory metal reduction, ion exchange, electrified interfaces, specific adsorption, and dissolution/precipitation.

3 units, Win (Fenderson)


3 units (Bird) alternate years, not given 2001-02

270. Petrologic Phase Equilibria—The principles of phase equilibrium determined by lab experimentation and thermochemical calculation, as applied to igneous and metamorphic petrology. Focus is on the underlying principles of classical thermodynamics which govern mineral equilibria. Introduction to phase relations, element partitioning, chemical kinetics, and order-disorder phenomena in geologic systems.

4 units (Ernst) alternate years, given 2001-02

275. Electron Microanalytical Techniques—The practical and theoretical aspects of x-ray generation and detection, and the behavior of electron beams and x-rays in solids. The basic principles needed to quantitatively analyze chemically complex geological materials. Operation of the JEOL 733 electron microprobe and associated computer software for quantitatively analyzing materials. X-ray chemical mapping. Enrollment limited to 8.

3 units, Win (Jones)

285. Petrogenesis of Crustal Magmatism—Radiogenic isotopes (Rb-Sr, Sm-Nd, Re-Os, U-Pb, and U-series disequilibrium systems), stable isotopes, and trace elements applied to igneous processes; evidence for the nature of basalt sources; interaction of magmas with mantle and crust; convergent-margin magmatism; magmatism in extensional terrains; origins of rhyolites; residence times of magmas and magma chamber processes; granites as imperfect mirrors of their source regions; trace-element modeling of igneous processes; trace-element discriminant diagrams in tectonic analysis; sources of ore forming metals. Topics emphasize the interests of students. Prerequisite: 181, or its equivalent.

3 units, Win (Mahood) alternate years, not given 2001-02

290. Numerical Analysis of Geological Time Series—Seminar for graduate students interested in a variety of statistical tools appropriate for analysis of time series. Topics: fourier transform techniques, singular spectrum analysis, evolutionary spectral analysis, and filtering. Prerequisites: some knowledge of UNIX.

3 units (Dunbar) alternate years, not given 2001-02

295. Integrating Remote Sensing and Geographic Information Systems (GIS)—For graduate students; see 195.

296. Introduction to GIS: ARC/INFO and ARC-View—(Same as Geophysics 296.) For graduate students; see 196.

297. Research in the Application of Geographic Information Systems (GIS)—For graduate students; see 197.

314A,P. Research Seminar: Structural Geology and Geomechanics—Selected topics. May be repeated for credit.

1 unit, Aut, Win, Spr (Pollard, Aydin)

322A,B,C. Seminar in Biogeochernistry—Presentations and discussion of current topics in biogeochernistry. May be repeated for credit.

1-2 units, Aut, Win, Spr (Matson)


1-2 units, Aut, Win, (Loague)

330.A,B,C. Advanced Topics in Hydrogeology—Critical discussion of modern topics in groundwater hydrology. Topics: questioning classic explanations of physical processes; consideration of coupled physical, chemical, and biological processes effecting heat and solute transport.

1-2 units, Aut, Win, Spr (Gorelick)

332A,B. Seminar in Hydrogeology

1 unit, Aut (Gorelick)

Win (Loague)

333. CESIR Seminar—The Center for Earth Science Information Research seminars are a multi-disciplinary lecture series. Emphasis is on the utilization of science for policy analysis and decision making. Speakers are from the physical and social sciences.

1-2 units, Spr (Bernknopf)

335. Special Topics in Earth Sciences Seminar—Presentation and discussion of current topics in the earth sciences. Suggested topics: gas hydrates, paleoproductivity, the glacial world, mass extinctions, the K/T boundary, hydrothermal vents, paleocirculation, warm climates in Earth's history, geomicrobiology, evaporite deposits. Each year a different topic is given with lectures by guest speakers.

1-2 units, Aut, Win, Spr (Paytan) alternate years, given 2001-02

342A,B,C. Seminar: Geostatistics—Discussion of classic results and current research in geostatistics. Topics selected on basis of interest and timeliness. May be repeated for credit.

1-2 units, Aut, Win, Spr (Journel)

350. Seminar in Sedimentary Geology

1-3 units, Win, Spr (Staff)

360. Topics in Low Temperature Surface and Aqueous Geochemistry—Guided independent study, analysis, and critical oral and written reports on selected topics in environmental, surface, and/or aqueous geochemistry under earth-surface conditions. Prerequisites: 80 and 264; consent of instructor.

2-4 units, one quarter annually (Brown, Parks)
Geophysics

Emeritus: George A. Thompson (on active duty)
Chair: Jerry M. Harris

Professors: Jon F. Claerbout, Steven Gorelick, Jerry M. Harris, Rosemary I. Knight, Robert L. Kovach, Marcia McNutt†, Amos M. Nur, Joan Roughgarden*, Paul Segall, Norman H. Sleep, Mark D. Zoback

Associate Professors: Gregory C. Beroza, Simon L. Klemperer, Howard Zeckert**
Assistant Professor: Kevin Arrigo
Professors (Research): Antony Fraser-Smith**, Gerald M. Mavko
Associate Professor (Research): Biondo Biondi

Geophysics is the branch of earth science concerned with exploring and analyzing active processes of the earth through physical measurement. The undergraduate and graduate programs are designed to provide (1) a background of fundamentals in science, and (2) courses to coordinate these fundamentals with the principles of geophysics. The program leading to the Bachelor of Science (B.S.) in Geophysics permits many electives and a high degree of flexibility for each individual student. Graduate programs provide specialized training for professional work in resource exploration, research, and education and lead to the degrees of Master of Science and Doctor of Philosophy.

The Department of Geophysics is housed in the Ruth Watts Mitchell Earth Sciences Building. It has numerous research facilities, among which are a state-of-the-art broadband seismic recording station, high pressure and temperature rock properties and rock deformation laboratories, computers, various instruments for field measurements including seismic recorders, nine dual frequency GPS receivers, and field equipment for measuring in-situ stress at great depth. Current research activities include biogeochemical cycling; crustal deformation; earthquake archaeology; earthquake seismology and earthquake mechanics; reflection, refraction, and tomographic seismology; rock mechanics, rock physics; seismic studies of the continental remote sensing; lithosphere, and environmental geophysics; and synthetic aperture radar studies.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

Objectives — To provide a solid background in the essentials of math, physics, and geology, while at the same time providing knowledge about the entire spectrum of geophysics ranging from exploration geophysics to earthquake seismology and plate tectonics. Students are prepared for either an immediate professional career in the resources and environmental sciences industries or future graduate study.

The following courses are required for the B.S. degree in Geophysics, in addition to the University requirements in general studies. A written report on original research or an honors thesis is also required. Normally, this is undertaken as part of the student's participation in three quarters of Research Seminar (the Geophysics 185 series) during the senior year. Seniors in Geophysics who expect to do graduate work are urged to take the Graduate Record Examination as early as is convenient in their final undergraduate year.

CURRICULUM

Course No. and Subject

Chem. 31. Chemical Principles
Elect. Engr. 141 or Physics 120. Electromagnetic Fundamentals
Geol. & Envir. Sci. 1. Fundamentals of Geology
Geoph. 185. Research Seminars
Math. 19, 20, 21 or 41, 42, or 51, 52
Math. 130. Ordinary Differential Equations
Physics 41. Mechanics
4. Submit a Program Proposal for the Master's Degree in the first quarter.

5. Each student must present and defend the results of his or her research at a public oral presentation attended by at least two faculty members. Students who do not meet the standard course requirements (see the undergraduate curriculum), but who have unusual competence in other areas such as earth systems, science, or space physics may petition the Geophysics faculty to arrange individual programs.

M.S. IN EXPLORATION AND DEVELOPMENT

Objectives—To provide the theoretical and practical background needed for a career in petroleum exploration and development geophysics. The program takes a minimum of four quarters (beginning and ending in the Autumn Quarter), but more typically six quarters. A summer internship working in industry, or a research or experimental laboratory, is an integral part of the program. A written report based on the summer internship is publicly presented and defended. Some MSED students also accomplish independent research during their degree program through their participation in one or multiple quarters of Research Seminar (the Geophysics 385 series).

Prerequisites—B.S. degree in engineering, geology, geophysics, mathematics, or physics; a sequence of courses in mathematics at least through ordinary differential equations; and at least one course in introductory geology. The following additional undergraduate courses are recommended: computer science, complex variables, linear algebra, petrology, and structural geology.

Requirements for the Degree—Geophysics 111, 112, 120, 150, 174, 182, 183, 190, 210, 262, 380A, 380B; Geological and Environmental Sciences 110 or 111, 240, 247 or 248, 251, 253; Petroleum Engineering 120, 130; Electrical Engineering 104 or 261; and elective courses in earth sciences, mathematics, physics, and engineering. If appropriate, requirements may be waived and additional electives substituted with consent of the candidate’s faculty adviser and of the Geophysics faculty Graduate Coordinator. Recommended electives include Geophysics 160, 170, 180, 202, 230, 285, 397; Geological and Environmental Sciences 151, 249; and Mechanical Engineering 200A. At least 45 units with a grade point average (GPA) of at least 'B' are required for the completion of this degree.

DOCTOR OF PHILOSOPHY

Objectives—The Ph.D. degree is conferred upon evidence of high attainment in Geophysics, and ability to conduct an independent investigation and present the results of such research.

Requirements for the Degree—A minimum of three years and the completion of 108 units of graduate study at Stanford must be satisfactorily completed. During their first two years, candidates must complete a core sequence of classes: Geophysics 111, 112, 120, 150, 160; Mechanical Engineering 200A, 238A; Electrical Engineering 261 or Mechanical Engineering 308, and one data analysis course such as Geophysics 180 or 211, Petroleum Engineering 284, Civil and Environmental Engineering 267, Geological and Environmental Sciences 160 or 240, Statistics 110, or equivalent. Candidates must also participate in Research Seminars (the Geophysics 385 series) from their first quarter.

During the course of their studies, Ph.D. candidates are additionally required to complete Geophysics 170, 190; Engineering 102W; Physics 210 or Mathematics 220A or Mechanical Engineering 200B. Students are also encouraged to complete Physics 211 or Mathematics 220B or Mechanical Engineering 200C. Candidates are required to complete lecture classes outside the core sequence from at least two different Geophysics faculty members; and at least two non-Geophysics lecture classes in Earth Sciences (that is, the Department of Geological and Environmental Sciences and/or the Department of Petroleum Engineering). A minimum equivalent knowledge at the level of Geological and Environmental Sciences 1 is required. Highly recommended non-Geophysics Earth Science courses are Geological and Environmental Sciences 111, 120, 140, 231, and 251; and Petroleum Engineering 120, 130, 221, 224, and 240. Additional advanced courses should be selected from other science and engineering departments. A typical sequence for entering graduate students in their first year is: Autumn—Geophysics 111, 112, 120, 130, and Mechanical Engineering 200A or 238A; Winter—Geophysics 160, 385, and one elective; Spring—Geophysics 180, 385, and Electrical Engineering 261 or other elective. All students prepare a proposed study list for each year by the end of the first quarter of that year.
If appropriate, any class requirement may be waived, or electives substituted, with written consent of both the candidate's faculty adviser and the Geophysics Graduate Coordinator.

The candidate's record must indicate outstanding scholarship, and deficiencies in previous training must be removed. Experience as a teaching assistant (quarter-time for at least two academic quarters) is required for the Ph.D. degree. The student must pass the departmental oral examination by presenting and defending a written research paper or proposal by the end of the second year; prepare under faculty supervision a dissertation that is a contribution to knowledge and the result of independent work expressed in satisfactory form; and pass the University oral examination, which is essentially a defense of the dissertation. The Ph.D. dissertation must be submitted in its final form within five calendar years from the date of admission to candidacy. The Geophysics faculty monitors student progress by carrying out an annual performance appraisal (at a closed faculty meeting) of all students who have not yet passed their departmental oral examination. Following successful completion of the departmental oral examination, candidates are required to organize an annual meeting of their research committee to review their progress towards the Ph.D. degree.

COURSES

4. Natural Hazards and Human Survival—For non-majors and potential earth scientists. Introduction to understanding natural and other hazards, earthquakes, volcanic eruptions, tsunamis, toxic waste disposal, nuclear power plant siting, their risk assessment, possible mitigation, and protective measures. GER:2a (DR:5)
   3 units, Aut (Beroza, Segall)
   Win (Kovach)

5Q. Stanford Introductory Dialogue: Earthquakes of the Americas—Preference to sophomores. Earthquakes have had an impact on the development of cultures and societies. The early empires of the Maya and the Aztecs undoubtedly experienced earthquakes and volcanic eruptions and we rely on archaeological remains and glyphs from codices to ascertain past occurrences. Evidence from several Mexican and Central American archaeological sites uncovers the societal consequences and possible role of these natural events in the abandonment, migration, and settlement of cultural centers.
   2 units, Aut (Kovach)

30Q. Stanford Introductory Dialogue: The 1906 San Francisco Earthquake—Preference to sophomores. Earthquakes have had an impact on the development of cultures and societies. The early empires of the Maya and the Aztecs undoubtedly experienced earthquakes and volcanic eruptions and we rely on archaeological remains and glyphs from codices to ascertain past occurrences. Evidence from several Mexican and Central American archaeological sites uncovers the societal consequences and possible role of these natural events in the abandonment, migration, and settlement of cultural centers.
   2 units, Spr (Beroza)

   3 units, Spr (Zebker)

50Q. Stanford Introductory Dialogue: Earthquakes and Archaeology in the Eastern Mediterranean—Lectures and Field Trip—Preference to sophomores. Why are there so many archaeological ruins in the eastern Mediterranean? Assumed by many to be the result of time and wars, many of these ruins are due to historic and prehistoric earthquakes. Modern science reveals that some of these earthquakes must have been so destructive, or happened at times of such political and military stress, that they changed history (e.g., the fall of Jericho before Joshua, the catastrophic collapse at the end of the Bronze Age). Lectures
graphic features. Prerequisites: Geophysics 130, Earth Systems 130, or Hopkins Marine 163H/263H.

142. Principles of Ecology.—(Same as Biological Sciences 142.) Introduction to ecology, emphasizing ecological theory and the population and community scales of organization, using primarily zoological examples. Evolutionary processes in ecology. Prerequisites: first-year calculus (Mathematics 19-21 or higher). Recommended: Biological Sciences 43 or 51.

4 units (Arrigo) alternate years, given 2001-02


3 units, Aut (Sleep, Klemperer)


3 units, Win (Harris, Claerbout, Beroza)

170. Fluids in the Earth's Crust.—Interdisciplinary problems involving the state and movement of fluids in the earth's crust: basics of the coupling in porous rocks between chemical transport, fluid flow, deformation and stress, and waves; applications to gas hydrates under the oceans; reservoir geophysics; geophysical recovery monitoring; aquifer geophysics; pore pressure in faulting and aftershocks and in the earth's crust; permeability from seismic; viscoelastic rebound; pore fluids and subduction; sediment transport to seismic reflection; pressure solution and stylolites. Prerequisite: consent of instructors.

3 units, Win (Nur, Dvorkin)

180. Geophysical Inverse Problems.—Fundamental concepts of inverse theory, with application to geophysics. Inverses with discrete and continuous models, generalized matrix inverses, resolving kernels, regularization, use of prior information, singular value decomposition, nonlinear inverse problems, back-projection techniques, and linear programming. Application to seismic tomography, earthquake location, migration, and fault-slip estimation. Prerequisite: Mathematics 103.

3 units, Spr (Beroza, Segall)

182. Reflection Seismology.—The principles of seismic reflection profiling, focusing on methods of seismic data acquisition and seismic data processing for hydrocarbon exploration.

3 units (Klemperer) alternate years, not given 2001-02

183. Interpretation of Seismic Reflection Profiles.—Lectures and workshops on the structural and stratigraphic interpretation of seismic reflection data, emphasizing hydrocarbon traps in two and three dimensions on industry data, including workstation-based interpretation. Lectures only; 1 unit. Prerequisite: 182, or consent of instructor.

1-4 units, Spr (Klemperer, Graham) alternate years, not given 2001-02

184. Seismic Data Processing.—Workshop experience in computer processing of seismic reflection data. Students individually process a commercial seismic reflection profile from field tapes to migrated stack, using interactive software on a workstation. Prerequisite: consent of instructor.

3 units (Klemperer) alternate years, not given 2001-02
197. Research in the Application of Geographic Information Systems (GIS)—(Enroll in Geological and Environmental Sciences 197.) 1-5 units, Aut, Win, Spr (Klemperer)

202. Reservoir Geomechanics—Basic principles of rock mechanics and the state of stress and pore pressure in sedimentary basins related to exploitation of hydrocarbon and geothermal reservoirs. Mechanisms of hydrocarbon migration, exploitation of fractured reservoirs, reservoir compaction and subsidence, hydraulic fracturing, utilization of directional and horizontal drilling to optimize borehole stability, minimization of sand production. 3 units, Win (Zoback)

205. Honors Program—Experimental, observational, or theoretical honors project and thesis in geophysics under supervision of a faculty member. Students who elect to do an honors thesis should begin planning it no later than Winter Quarter of the junior year. Prerequisites: superior work in the earth sciences and approval of the department. 1-3 units, Aut, Win, Spr, Sum (Staff)


211. Environmental Soundings Image Enhancement—Basic ideas of geophysical data mapping and imaging as exemplified by a variety of elementary examples: interpolate, extrapolate, regrid, depth sounding, sea-beam bathymetry, satellite altimetry, imaging, seismic velocity, and reflectivity. Adjoints, back projection, and images. Applied inverse theory using least-squares conjugate gradients. Weights and filters in data space and model space. Decompose data into signal and noise. See http://sepwww/sep/prof. 3 units, Win (Claerbout)

215. Advanced Structural Geology and Rock Mechanics—(Same as Geological and Environmental Sciences 215.) 3 units, Aut (Pollard)

216. Rock Fracture Mechanics—(Same as Geological and Environmental Sciences 216.) 5 units (Pollard) alternate years, given 2001-02

230. Advanced Topics in Well Logging—(Same as Petroleum Engineering 230.) Designed to follow a course in standard well logging, and assumes knowledge of standard practice and application of electric well logs. Guest lectures on state-of-the-art tools and analyses; and the technology, rock physical basis, and applications of each measurement. Hands-on computer-based analyses illustrate instructional material. Prerequisite: Petroleum Engineering 130 or equivalent. 3 units, Spr (Lindblom)

240. Borehole Seismology—The study and application of seismic-acoustic waves in and around boreholes for application to sonic well logging, crosswell seismic profiling, and vertical seismic profiling. Topics: forward modeling, seismogram interpretation, data processing, imaging, and inversion. Applications from reservoir and site characterization studies and reservoir monitoring. Prerequisite: consent of instructor. 3 units (Harris) alternate years, given 2001-02

241. Practice of Geostatistics and Seismic Data Integration—(Same as Petroleum Engineering 241.) Students build a synthetic 3D fluvial channel reservoir model with layer depths, channel geometry, and facies-specific petrophysic and seismic properties, stressing the physical significance of geophysical data. Reference data set is sparsely sampled, providing the sample data typically available for an actual reservoir assessment. Geostatistical reservoir modeling uses well and seismic data, with results checked against the reference database. All software provided (Gslib and SRF tools). Recommended: basic prior experience with Unix, Matlab/Fortran programming. Prerequisite: 240. 3-4 units, Spr (Caers, Mukerji)

242. Principles of Ecology—(Enroll in Biological Sciences 242.) 4 units, Aut (Roughgarden)

255. Report on Energy Industry Training—Provides on-the-job training for master’s and doctoral degree students under the guidance of experienced, on-site supervisors. Students must submit a concise report detailing work activities, problems, assignments, and key results. Prerequisite: written consent of adviser. 1-3 units, any quarter (Staff)

262. Rock Physics—Properties of rocks in relation to geophysical exploration, crustal studies, and tectonic processes. Emphasis is on wave velocities and attenuation, hydraulic permeability, and electrical resistivity in rocks. Application to in situ problems, using lab data and theoretical results. 3 units, Spr (Mavko)

280. 3-D Reflection Seismology—The principles of imaging complex structures in the Earth subsurface using 3-D reflection seismology. Emphasis is on processing methodologies and algorithms, with examples of applications to field data. Topics: acquisition geometries of land and marine 3-D seismic surveys, time vs. depth imaging, migration by Kirchhoff methods and by wave-equation methods, migration velocity analysis, velocity model building, imaging irregularly sampled and aliased data. Computational labs involve some programming. Lab for 3 units. 2-3 units, Spr (Biondi)

285. Earth Soundings Analysis—Convolution, spectra, discrete Fourier transform, Z-plane, feedback, adjoint operators, model fitting by least squares, time series analysis, missing data restoration, phase, resolution and random signals, signal entropy. 3 units, Win (Klemperer)

286. Electromagnetic Techniques in Geophysics—The general principles behind the electromagnetic techniques used to study the interior of the earth and to detect ore bodies, oil reservoirs, and underground man-made structures. Topics: the earth’s magnetic and electric fields, electromagnetic wave propagation through the earth (and through earth materials), electric and magnetic properties of earth materials, earth resistivity methods, magnetotellurics, magnetometers and magnetic-field gradiometers, electromagnetic induction, and ground-penetrating radar. Recommended: undergraduate electromagnetism. 4 units (Fraser-Smith) alternate years, not given 2001-02

287. Earthquake Seismology—Topics: basic theorems in elastodynamics, Green’s functions, attenuation, wave propagation in layered media, ray theory, seismic moment tensors, finite-source effects, kinematics and dynamics of earthquakes, engineering aspects of seismology. 3 units (Beroza) alternate years, given 2001-02

288. Crustal Deformation—Collection, reduction, and analysis of crustal deformation measurements for the study of relative plate motions, plate boundary deformation, earthquake and volcanic processes, postglacial rebound, and land subsidence. Mechanical models of faulting and magmatic deformation, coupled fluid flow and deformation, and inverse methods for analyzing data. 3 units (Segall) alternate years, given 2001-02
289. Global Positioning System in Earth Sciences—The basics of GPS, emphasizing monitoring crustal deformation with a precision of millimeters over baselines to thousands of kilometers long. Applications: mapping with GIS systems, airborne gravity and magnetic surveys, marine seismic and geophysical studies, mapping atmospheric temperature and water content, measuring contemporary plate motions, and deformation associated with active faulting and volcanism.  
3 units, Win (Segall) alternate years, not given 2001-02

3 units (Zoback) alternate years, not given 2001-02

296. Introduction to GIS: ARC/INFO and Arc-View—(Same as Geological and Environmental Sciences 296.) For graduate students; see 196.  
2 units, Win (Klemperer)

297. Research in the Application of Geographic Information Systems (GIS)—(Enroll in Geological and Environmental Sciences 297.)  
1-3 units, Aut, Win, Spr (Klemperer)

355. Report on Energy Industry Training—Provides on-the-job training for advanced doctoral students under the guidance of experienced, on-site supervisors. Students must submit a concise report detailing work activities, problems, assignments, and key results. Prerequisite: written consent of adviser.  
1 unit, any quarter (Staff)

355A. Imaging Radar and Applications—(Enroll in Electrical Engineering 355.)  
3 units, alternate years, given 2001-02

380A. 1 unit, Aut (Mavko)  
380B. 3 units, Aut (Mavko)

385. Research Seminar Series—Opportunity for advanced graduate students to frame and pursue research or thesis research within the context of one of the ongoing research projects in the department, and present thesis research progress reports before a critical audience on a regular basis. See 185 series for descriptions. Prerequisite: consent of the instructor.  
1-3 units, Aut, Win, Spr

385A. Reflection Seismology  
(Biondi, Claerbout)

385D. Topics in Crustal Fluids  
(Nur)

385E. Tectonics  
(Klemperer, Sleep, Thompson)

385K. Borehole Geophysics  
(Zoback)

385L. Earthquake Seismology, Deformation, and Stress  
(Segall, Zoback, Beroza)

385S. Seismic Tomography  
(Harris)

385V. Poroelasticity  
(Mavko)

385Y. Theoretical Ecology—(Same as Biological Sciences 384.)  
Spr (Roughgarden)

385X. Applied Geophysics  
(Staff)

385Z. Radar Remote Sensing  
(Zebker)

399. Teaching Experience in Geophysics—On-the-job training in the teaching of geophysics. An opportunity to develop problem sets and lab exercises, grade papers, and give occasional lectures under the supervision of the regular instructor of a geophysics course. Regular conferences with instructor and with students in the class provide the student teacher with feedback about effectiveness in teaching.  
2-4 units, any quarter (Staff)

400. Research in Geophysics  
any quarter (Staff)

PETROLEUM ENGINEERING

Emeriti: (Professors) William E. Brigham†, John W. Harbaugh*, Sullivan S. Marsden, Jr.  
Chair: Roland N. Horne  
Associate Chair: Thomas A. Hewett  
Professors: Khalid Aziz, Thomas A. Hewett, Roland N. Horne, Andre Journel†, Franklin M. Orr, Jr.  
Assistant Professors: Jef Caers, Anthony R. Kovscek  
Associate Professor (Research): Louis J. Durlofsky  
Courtesy Professors: Stephan A. Graham, George M. Homys  
Acting Assistant Professor: David DiCarlo  
Consulting Professor: Robert G. Lindblom  
Consulting Associate Professor: Clayton V. Deutsch  
† Joint appointment with Geological and Environmental Sciences  
† Recalled to active duty

Petroleum engineers are concerned with the design of processes for energy recovery from oil and gas reservoirs. Included in the design process are characterizing the spatial distribution of reservoir properties, drilling wells, designing and operating production facilities, selecting and implementing methods for enhancing fluid recovery, predicting recovery process performance, monitoring reservoirs, and examining the environmental aspects of petroleum exploration and production. The Department of Petroleum Engineering curriculum provides a sound background in basic sciences and their application to practical problems to address the complex and changing nature of the field. Course work includes the fundamentals of chemistry, computer science, engineering, geology, geophysics, mathematics, and physics. Applied courses cover most aspects of petroleum engineering and some related fields like geothermal engineering and geostatistics. The curriculum emphasizes the fundamental aspects of fluid flow in the subsurface. These principles apply equally well to optimizing oil recovery from petroleum reservoirs and remediating contaminated groundwater systems.

Faculty and graduate students in the department conduct research in a variety of areas including: enhanced oil recovery by thermal means, gas injection, and the use of chemicals; flow of fluids in pipes; geostatistical reservoir characterization and mathematical modeling; geothermal engineering; natural gas engineering; optimization; properties of petroleum fluids; reservoir simulation using computer models; and well test analysis. Undergraduate students are encouraged to participate in research projects. Graduate programs lead to the degrees of Master of Science (M.S.), Engineer, and Doctor of Philosophy (Ph.D.) in Petroleum Engineering.

M.S., Engineer, and Ph.D. degrees may be awarded with field designations for students who follow programs of study in the fields of geostatistics, geothermal, crustal fluids, or environmental specialties.

The department is housed in the Green Earth Sciences Building and operates laboratories for research in various enhanced oil recovery
processes and geothermal engineering. Students have access to a variety of computers for research and course work. Computers available for instruction and research include eight UNIX workstations and three multi-processor multi-user NT servers within the department, as well as extensive campus-wide computer clusters. Each graduate student office has one X-terminal per student.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

The four-year program leading to the B.S. degree provides a foundation for careers in many facets of the energy industry. The curriculum includes basic science and engineering courses that provide sufficient depth for a wide spectrum of careers in the energy and environmental industries.

One of the goals of the program is to provide experience integrating the skills developed in individual courses to address a significant design problem. In Petroleum Engineering 180, taken in the senior year, student teams design facilities for a real petroleum reservoir to meet specific management objectives.

PROGRAM

The requirements for the B.S. degree in Petroleum Engineering are similar to those described in the “School of Engineering” section of this bulletin. Students must satisfy the University general education, writing, and language requirements. The normal Petroleum Engineering undergraduate program automatically satisfies the University General Education Requirements (GERs) in area 2a (Natural Sciences), area 2b (Technology and Applied Sciences), and area 2c (Mathematics). Engineering fundamentals courses and petroleum engineering depth and elective courses must be taken for a letter grade.

In brief, the credit and subject requirements are:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Minimum Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering fundamentals</td>
<td>25</td>
</tr>
<tr>
<td>General Education, writing, language, and electives</td>
<td>68-69</td>
</tr>
<tr>
<td>Mathematics</td>
<td>23</td>
</tr>
<tr>
<td>Petroleum engineering depth</td>
<td>3-40</td>
</tr>
<tr>
<td>Science</td>
<td>26</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>181</strong></td>
</tr>
</tbody>
</table>

The following courses constitute the normal program leading to a B.S. in Petroleum Engineering. The program may be modified to meet a particular student’s needs and interests with the adviser’s prior approval.

MATHEMATICS

Course No. and Subject

Unis

Math. 41. Single Variable Calculus
5
Math. 42. Single Variable Calculus
5
Math. 19. Calculus
3
Math. 20. Calculus
3
Math. 21. Calculus
3
Math. 51. Linear Algebra and Differential Calculus of Several Variables
5
Math. 52. Integral Calculus of Several Variables
5
Math. 130. Ordinary Differential Equations
3
Math. 193. Differential Equations in Engineering
3
**Total**
23

SCIENCE

Chem. 31. Chemical Principles
4
Chem. 33. Structure and Reactivity
4
Chem. 171. Physical Chemistry
3
Geol. & Envir. Sci. 1. Fundamentals of Geology
5
Physics 41. Mechanics
3
Physics 43. Electricity
3
Physics 45. Magnetism
3
Physics 46. Electricity and Magnetism Laboratory
1
**Total**
26

ENGINEERING FUNDAMENTALS

Comp. Sci. 106A. Programming Methodology
5
Comp. Sci. 106X. Programming Methodology and Abstractions
5
5
Engr. 15. Dynamics
5
Engr. 30. Engineering Thermodynamics
3
Mech. Engr. 33. Introductory Fluids Engineering
4
**Total**
25

ENGINEERING DEPTH

The following courses constitute the core program in Petroleum Engineering:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem. Engr. 120A. Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>or Chem. Engr. 180. Chemical Engineering Plant Design</td>
<td></td>
</tr>
<tr>
<td>Chem. Engr. 185A. Chemical Engineering Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>Chem. Engr. 185B. Chemical Engineering Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>Geol. &amp; Envir. Sci. 110. Structural Geology and Rock Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>Geol. &amp; Envir. Sci. 151. Sedimentary Geology and Petrography</td>
<td>4</td>
</tr>
<tr>
<td>Pet. Engr. 120. Reservoir Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Pet. Engr. 130. Well Log Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Pet. Engr. 140. Drilling and Completion Technology</td>
<td>3</td>
</tr>
<tr>
<td>Pet. Engr. 175. Well Test Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Pet. Engr. 280. Oil and Gas Production Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Pet. Engr. 260. Groundwater Pollution and Oil Spills</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

A list of suggested electives and sample course programs are available in the Department of Petroleum Engineering, room 65, Green Earth Sciences Building. It is important to start mathematics courses in the first year and engineering and geology early in the second year. Computers are used extensively in most petroleum engineering courses. Students must develop programming skills through appropriate course work and self-study and are expected to achieve fluency in the use of FORTRAN, C, or C++ by their junior year.

MINORS

To be recommended for a B.S. degree with Petroleum Engineering as a minor subject, a student must take the following courses in addition to those required by the major department or program: Pet. Engr. 120, 121, 130, 175, 180; Geol. & Envir. Sci. 111 and 151. In some programs, Geol. & Envir. Sci. 111 or 151 may also satisfy major requirements.

HONORS PROGRAM

A limited number of undergraduates may be admitted to the honors program at the beginning of their senior year.

To be admitted, the student must have a grade point average (GPA) of at least 3.0 in all course work in the University. In addition to the minimum requirements for the B.S. degree, the student must complete 6 units of advanced petroleum engineering courses and at least 3 units of research (Pet. Engr. 193).

Students who wish to be admitted to the honors program should consult with their adviser before the start of their senior year. Those who do not meet all of the formal requirements may petition the department for admission. Those completing the program receive the B.S. degree in Petroleum Engineering with Honors. An overall 3.5 GPA is required in all petroleum engineering courses for graduation with honors.

COTERMINAL B.S. AND M.S. PROGRAM

The coterminal B.S./M.S. program offers a unique opportunity for Stanford University students to pursue a graduate experience while completing the B.S. degree in any relevant major. Petroleum Engineering graduate students generally come from a variety of backgrounds such as chemical, civil, or mechanical engineering; geology or other earth sciences; or physics or chemistry. Students should have a background at least through Mathematics 130 and Computer Science 106 before beginning graduate work in this program.

The two types of M.S. degrees, the course work only degree, and the research degree, as well as the courses required to meet degree requirements are described below in the M.S. section. Both degrees require 45 units and may take from one to two years to complete depending on various circumstances unique to each student.

Requirements to enter the program are two letters of recommendation from faculty members or job supervisors, a statement of purpose, scores from the GRE general test, and a copy of Stanford University transcripts. While the department does not require any specific GPA or GRE
score, potential applicants are expected to compete favorably with graduate student applicants.

A Petroleum Engineering master’s degree can be used in a variety of ways. It is considered a terminal professional degree which prepares the student to obtain a professional job in the petroleum or geothermal industry, or in any related industry where analyzing flow in porous media or computer simulation skills are required. It can also be a stepping stone to a Ph.D. degree, which usually leads to a professional research job or an academic position.

Students should apply to the program any time after they have completed 105 undergraduate units, and in time to take Petroleum Engineering 120, the basic introductory course in Autumn Quarter of the year they wish to begin the program. Contact the Department of Petroleum Engineering to obtain additional information.

GRADUATE PROGRAMS

The University’s basic requirements for M.S., Engineer, and Ph.D. degrees are discussed in the “Graduate Degrees” section of this bulletin.

The energy industry provides a variety of employment opportunities for petroleum engineers with advanced training. A balanced master’s degree program including both engineering course work and research requires a minimum of one maximum tuition academic year beyond the baccalaureate to meet the University residence requirements. Most full-time students spend at least one additional summer to complete the research requirement. An alternative master’s degree program based only on course work is available that also requires at least one maximum tuition academic year to meet University residence requirements.

Students who anticipate continuing in the Ph.D. program should follow the research option. M.S. students receiving financial aid normally require two academic years to complete the degree. Such students must take the research option and are limited to a 9-unit course load per quarter.

The degree of Engineer requires a comprehensive maximum tuition two-year program of graduate study. This degree permits more extensive course work than the master’s degree, with an emphasis on professional practice. All Engineer’s degree students receiving financial aid are also limited to a 9-unit course load per quarter and need at least ten quarters of work to complete the degree.

The Ph.D. degree is awarded primarily on the basis of completion of significant, original research. Extensive course work and a minimum of three maximum tuition years of graduate work beyond the master’s degree is required. Doctoral candidates planning theoretical work are encouraged to gain experimental research experience in the M.S. program. Ph.D. students receiving financial assistance are limited to 9 units per quarter and often require more than three years to complete the Ph.D.

In special cases, the M.S., Engineer, and Ph.D. degrees may be awarded with field designations for students who follow programs of study in the particular fields of (1) geostatistics, (2) geothermal, (3) crustal fluids, or (4) environmental. For example, students may be awarded the degree Master of Science in Petroleum Engineering (Geothermal).

MASTER OF SCIENCE

The objective is to prepare the student for professional work in the energy industry through completion of fundamental courses in the major field and in related sciences as well as independent research.

Students entering the graduate program are expected to have an undergraduate-level petroleum engineering background. Competence in computer programming in a high-level language (Computer Science 106X or the equivalent) and knowledge of petroleum engineering and geological fundamentals (Petroleum Engineering 120, 130, 140, and Geological and Environmental Sciences 151) are prerequisites for taking most graduate courses.

The candidate must fulfill the following requirements:

1. Register as a graduate student for at least three quarters at maximum tuition or the equivalent of partial-tuition quarters.
2. Submit a Program Proposal for the Master’s Degree approved by the adviser during the first quarter of enrollment.
3. Complete 45 units with at least a grade point average (GPA) of 3.0. This requirement is satisfied by taking the Core Sequence, selecting one of the seven elective sequences, an appropriate number of additional courses from the list of technical electives, and completing 6 units of master’s level research. Students electing the “course work only” M.S. degree are strongly encouraged select an additional elective sequence in place of the research requirement. Students interested in continuing for a Ph.D. are expected to choose the research option and enroll in 6 units of Petroleum Engineering 361. All courses must be taken for a letter grade.
4. Students entering without an undergraduate degree in Petroleum Engineering must make up deficiencies in previous training. Not more than 10 units of such work may be counted as part of the minimum total of 45 units toward the M.S. degree.

Research subjects include certain groundwater hydrology and environmental problems, energy industry management, flow of non-Newtonian fluids, geothermal energy, natural gas engineering, oil and gas recovery, pipeline transportation, production optimization, reservoir characterization and modeling, reservoir engineering, reservoir simulation, and transient well test analysis.

RECOMMENDED COURSES AND SEQUENCES

The following list is recommended for most students. With the prior special consent of the student’s adviser, courses listed under technical electives may be substituted based on interest or background.

CORE SEQUENCE

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pet. Engr. 175. Well Test Analysis</td>
<td>3</td>
</tr>
<tr>
<td>or Pet. Engr. 130. Well Log Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Pet. Engr. 222. Reservoir Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Pet. Engr. 251. Thermodynamics of Equilibria*</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
</tr>
</tbody>
</table>

* Optional for students taking the Geostatistics and Reservoir Modeling sequence.

ELECTIVE SEQUENCE

Choose one of the following:

Geostatistics:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geol. &amp; Envir. Sci. 230. Physical Hydrogeology</td>
<td>5</td>
</tr>
<tr>
<td>Geol. &amp; Envir. Sci. 231. Contaminant Hydrogeology</td>
<td>4</td>
</tr>
<tr>
<td>Geophys. 170. Fluids in the Earth’s Crust</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
</tr>
</tbody>
</table>

Geothermal:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>15-14</td>
</tr>
</tbody>
</table>

Surface Water and Groundwater:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civ. &amp; Envir. Engr. 270. Movement, Fate, and Effect of Contaminants in Surface Water and Groundwater</td>
<td>3</td>
</tr>
<tr>
<td>Civ. &amp; Envir. Engr. 274A. Environmental Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>Geol. &amp; Envir. Sci. 230. Physical Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>Geol. &amp; Envir. Sci. 264. Low Temperature Aqueous Geochemistry</td>
<td>3-4</td>
</tr>
<tr>
<td>Pet. Engr. 240. Geostatistics</td>
<td>3-4</td>
</tr>
<tr>
<td>Total</td>
<td>15-14</td>
</tr>
</tbody>
</table>

Enhanced Recovery:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>9-11</td>
</tr>
</tbody>
</table>

Geostatistics and Reservoir Modeling:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geophys. 182. Reflection Seismology</td>
<td>3</td>
</tr>
<tr>
<td>Pet. Engr. 240. Geostatistics for Spatial Phenomena</td>
<td>3-4</td>
</tr>
<tr>
<td>Pet. Engr. 241. Practice of Geostatistics</td>
<td>3-4</td>
</tr>
<tr>
<td>Total</td>
<td>9-11</td>
</tr>
</tbody>
</table>

Geothermal:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem. Engr. 120B. Energy and Mass Transport</td>
<td>4</td>
</tr>
</tbody>
</table>
Pet. Engr. 269. Geothermal Reservoir Engineering 3
Total 10

Reservoir Performance:
Geophys. 202. Reservoir Geomechanics 3
Pet. Engr. 223. Reservoir Simulation 3-4
Pet. Engr. 290. Oil and Gas Production Engineering 3
Total 9-11

Simulation and Optimization:
Pet. Engr. 223. Reservoir Simulation 3-4
Total 9-10

RESEARCH SEQUENCE:
Total units required for M.S. degree 45

* Students selecting the company sponsored "course work only" for the M.S. degree may substitute an additional elective sequence in place of the research.

TECHNICAL ELECTIVES

Technical electives from the following list of advanced-level courses usually complete the M.S. program. In unique cases, when justified and approved by the adviser prior to taking the course, courses listed here may be substituted for courses listed above in the elective sequence.

Geophys. 170. Fluids in the Earth's Crust 3
Geophys. 182. Reflection Seismology 3
Geophys. 190. Environmental and Applied Geophysics 4
Geophys. 202. Reservoir Geomechanics 3
Pet. Engr. 130. Well Log Analysis 3
Pet. Engr. 211. Computer Applications for Petroleum Engineers 3-4
Pet. Engr. 269. Geothermal Reservoir Engineering 3
Pet. Engr. 280. Oil & Gas Production Engineering 3
Pet. Engr. 281. Applied Mathematics in Reservoir Engineering 3

ENGINEER

The objective is to broaden training through additional work in engineering and the related sciences and by additional specialization.

Basic requirements include registering for at least six quarters at maximum tuition or the equivalent of partial-tuition quarters; completion of 90 units of course work including 15 units of research (Petroleum Engineering 362), and including all course requirements of the department's master's degree (39 units, excluding research). If the candidate has received credit for research in the M.S. degree, this credit ordinarily would be transferable to the Engineer degree, in which case a total of 9 additional research units would be required. No more than 10 of the 90 required units may be applied to overcoming deficiencies in undergraduate training.

At least 30 units in engineering and closely allied fields must be taken in advanced work, that is, work beyond the master's degree requirements and in addition to research (Petroleum Engineering 362). These may include courses from the Ph.D. degree list below or advanced-level courses from other departments with prior consent of the adviser. All courses must be taken for a letter grade. The student must have a grade point average (GPA) of at least 3.0 in courses taken for the degree of Engineer. A thesis based on 15 units of research must be submitted and approved by the adviser, another faculty member, and the University Committee on Graduate Studies.

DOCTOR OF PHILOSOPHY

The Ph.D. degree is conferred upon demonstration of high achievement in independent research and by presentation of the research results in a written dissertation and oral defense.

Basic requirements include a minimum of nine quarters of registration at maximum tuition or the equivalent in partial-tuition quarters of satisfactorily completed graduate study. Students must take at least 72 units beyond the 45 units required for the master's degree. The 72 units are composed of 36 units of research and 36 units of course work. The student's record must indicate outstanding scholarship. The student must pass the department's qualifying examination, submit an approved research proposal, fulfill the requirements of the minor department if a minor is elected, and pass the University oral examination, which is a defense of the dissertation. The student must prepare a dissertation based on independent research and that makes a significant contribution to the field.

The specification of 36 units of course work is a minimum; in some cases the research adviser may specify additional requirements to strengthen the student's expertise in particular areas. The 36 units of course work does not include teaching experience (Pet. Engr. 359), which is a requirement for the Ph.D. degree, nor any units in research seminars, which students are required to attend. All courses must be taken for a letter grade, with an average grade point average (GPA) of at least 3.25 in the 36 units of course work. The 36 units of course work may include graduate courses in petroleum engineering (numbered 200 and above) and courses selected from the following list. Other courses may be substituted with prior approval by the adviser. In general, non-technical courses are not approved.

MATH AND APPLIED MATH

Course No. and Subject Units
Aero. & Astro. 210A. Fundamentals of Compressible Flow 3
Aero. & Astro. 214A. Numerical Methods in Fluid Mechanics 3
Aero. & Astro. 214B. Numerical Computation of Compressible Flow 3
Chem. Engr. 300. Applied Mathematics in Chemical Engineering 3
Civ. & Envir. Engr. 268. Groundwater Flow 3-4
Comp. Sci. 106X. Programming Methodology and Abstractions 3
Comp. Sci. 137. Introduction to Scientific Computing 3-4
Comp. Sci. 193D. C++ and Object Oriented Programming 4
Comp. Sci. 331U. Software Engineering in C 3
Manage. Sci. & Engr. 111. Introduction to Optimization 4
Manage. Sci. & Engr. 211. Linear and Non-Linear Optimization 3
Math. 106. Introduction to Theory of Functions of a Complex Variable 3
Math. 113. Linear Algebra and Matrix Theory 3
Math. 114. Linear Algebra and Matrix Theory 3
Math. 115. Fundamental Concepts of Analysis 3
Math. 131. Partial Differential Equations I 3
Math. 132. Partial Differential Equations II 3
Stat. 110. Statistical Methods in Engineering and Physical Sciences 4
Stat. 201. Statistical Methods 3

SCIENCE

Geol. & Envir. Sci. 231. Cocontaminant Hydrogeology 4
Geol. & Envir. Sci. 253. Petroleum Geology and Exploration 3
Geophys. 182. Reflection Seismology 3
Geophys. 190. Environmental and Applied Geophysics 3-4
Geophys. 262. Rock Physics 3

ENGINEERING

Chem. Engr. 110. Equilibrium Thermodynamics 3
Chem. Engr. 120A. Fluid Mechanics 3
Chem. Engr. 120B. Energy and Mass Transport 3
Chem. Engr. 310A. Microscale Transport in Chemical Engineering 3
Chem. Engr. 310B. Connective Transport and Reaction Engineering 3
Engr. 299. Seminar in Fluid Mechanics 1
Mech. Engr. 250. Heat Transfer 4
Mech. Engr. 252C. Convective Heat Transfer 4

Ph.D. students are required to take the doctoral qualifying examination at the beginning of the second year of study. Students receiving a master's degree from the Department of Petroleum Engineering and continuing on for a Ph.D. are required to take the qualifying examination at the first opportunity after the completion of the requirements for the master's degree.

The qualifying examination consists of both a written and an oral section. The written part consists of three or four three-hour examinations on different subjects. The oral part is a three-hour examination in which
members of the department faculty question the student. Students are required to apply for candidacy for the Ph.D. degree after passing the department’s qualifying examination.

Within a year of passing the qualifying examination, the student must prepare a short written report that contains a literature review and a research proposal. This proposal must be approved after oral examination by a committee made up of the student’s adviser and two other faculty, one of whom must be from the department.

The dissertation must be submitted in its final form within five calendar years from the date of admission to candidacy. Candidates who fail to meet this deadline must submit an Application for Extension of Candidacy for approval by the department chair if they wish to continue in the program.

Ph.D. MINOR

To be recommended for a Ph.D. degree with Petroleum Engineering as a minor subject, a student must take 20 units of selected graduate-level lecture courses in the department. These courses must include Pet. Engr. 221 and 222. The remaining courses should be selected from Pet. Engr. 175, 223, 224, 225, 227, 280, 281, and 284.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

101. Energy and the Environment—(Same as Earth Systems 101.) Where the energy that powers society comes from, acknowledging that most current energy is generated from fossil resources. Case studies consider the consequences of current energy use patterns. Focus is on energy definitions, use patterns, resource estimation, pollution. Recommended: Mathematics 21 or 42, Engineering 30.

101Q. Stanford Introductory Seminar: Soap Bubbles, Raindrops, and Inkjets—Preference to sophomores. The behavior of bubbles and drops whose shapes are controlled by surface tension. Readings of Newton, Young, Laplace, and Plateau show how thinking about curved surfaces occupied scientists and mathematicians of the 18th and 19th centuries. A mathematical picture of a curved surface permits prediction of the shape of a bubble surface. The properties of curved surfaces determine many phenomena of daily life. Simple experiments and theory explore the physical manifestations of these curved liquid surfaces: the distribution of raindrops on a spider web, why sand grains stick together when damp, the design of a disposable diaper and the stability of a liquid jet in an inkjet printer. Prerequisite: Mathematics 42. GER:2b (DR:6)

110Q. Stanford Introductory Seminar: Soap Bubbles, Raindrops, and Inkjets—Alternate years, not given 2001-02


121. Fundamentals of Multiphase Flow—See 221.

122. Advanced Reservoir Engineering—Lectures, problems. Single-phase flow equations, tensor permeabilities, steady state and succession of steady state solutions. Radial flow and skin. Injectivity during fill-up...
of a depleted reservoir, injectivity for liquid-filled reservoirs, pattern elements. Flow potential and gravity forces, coning. Two-phase flow equations. Displacements in layered reservoirs, streamlines. Transient flow equation, primary drainage of a cylindrical reservoir, line source solution, pseudosteady state, pressure drawdown tests. Prerequisite: 221.

3 units, Win (Durlofsky)

223. Reservoir Simulation—Lectures, problems, and class project provide a thorough understanding of the fundamentals of petroleum reservoir simulation. Development of equations for multicomponent, multiphase flow between gridblocks comprising a petroleum reservoir. Relationships between black-oil and compositional models. Various techniques for developing black-oil, compositional, thermal, and dual-porosity models. Practical considerations in the use of simulators for predicting reservoir performance. Prerequisite: 221 and 246, or consent of instructor. Recommended: Mechanical Engineering 200C.

3-4 units, Win (Durlofsky, Aziz, Edwards)


3 units, Spr (Hewett) alternate years, not given 2001-02


3 units (Orr) alternate years, given 2001-02


3 units, Spr (Castanier) alternate years, not given 2001-02

227. Enhanced Oil Recovery—Lectures, problems. Introduction to the physics, theories, and methods of evaluating chemical, miscible, and thermal enhanced oil recovery projects. Existing methods and screening techniques, and analytical and simulation based means of evaluating project effectiveness. Dispersion-convection-adsorption equations, coupled heat, and mass balances and phase behavior provide requisite building blocks for evaluation.

3 units (Kovscek) alternate years, given 2001-02

230. Advanced Topics in Well Logging—(Same as Geophysics 230.) Designed to follow a course in standard well logging, and assumes knowledge of standard practice and application of electric well logs. Guest lectures on state-of-the-art tools and analyses; and the technology, rock physical basis, and applications of each measurement. Hands-on computer-based analyses illustrate instructional material. Prerequisite: 130 or equivalent.

3 units, Spr (Lindblom)

240. Geostatistics for Spatial Phenomena—(Same as Geological and Environmental Sciences 240.) Probabilistic modeling of spatial and/or time dependent phenomena. Kriging and cokriging for gridding and spatial interpolation. Integration of heterogeneous sources of information. Stochastic imaging of reservoir/field heterogeneities. Introduction to GSLIB software. Case studies from the oil and mining industry and environmental sciences. Prerequisites: introductory calculus and linear algebra, Statistics 116 or equivalent.

3-4 units, Win (Caers)

241. Practice of Geostatistics and Seismic Data Integration—(Same as Geological and Environmental Sciences 241, Geophysics 241.) Students build a synthetic 3D fluvial channel reservoir model with layer depths, channel geometry, and facies-specific petrophysical and seismic properties, stressing the physical significance of geophysical data. Reference data set is sparsely sampled, providing the sample data typically available for actual reservoir assessment. Geostatistical reservoir modeling uses well and seismic data, with results checked against reference database. All software provided (GSLib and SRFBtools). Recommended: basic prior experience with Unix, Matlab/Fortran programming. Prerequisites: 240.

3-4 units, Spr (Caers, Muerkji)

242. Topics in Advanced Geostatistics—(Same as Geological and Environmental Sciences 242A.) Conditional expectation theory and projections in Hilbert spaces; parametric vs. non-parametric geostatistics; Boolean, Gaussian, fractal, indicator, annealing approaches to stochastic imaging; multiple point statistics inference and reproduction; neural net geostatistics; Bayesian methods for data integration; techniques for upsampling hydrodynamic properties. May be repeated for credit. Prerequisites: 240, advanced calculus, Fortran/Unix.

3 units, Aut (Journal) alternate years, not given 2001-02

246. Reservoir Characterization and Flow Modeling with Outcrop Data—(Same as Geological and Environmental Sciences 246.) Project provides earth science students with an understanding of how to use outcrop observations in quantitative geological modeling and flow simulation, and addresses a specific reservoir management problem by studying a suitable outcrop analog (weekend field trip), constructing geostatistical reservoir models, and performing flow simulation. An introduction, through an applied example, to the relationship between the different disciplines. A different reservoir management question and outcrop analog is studied each year.

3 units, Aut (Aziz, Graham, Journal)


3 units, Aut (Kovscek)

255. Master's Students' Report on Energy Industry Training—Provides on-the-job training for master's degree students under the guidance of experienced, on-site supervisors. Students must submit a concise report detailing work activities, problems, assignments, and key results. Prerequisite: consent of adviser.

1 unit, Sum (Staff)


3 units (Staff) not given 2000-01
268. Seminar in Petroleum Engineering
1 unit, any quarter (Staff)

269. Geothermal Reservoir Engineering—Conceptual models of heat and mass flows within geothermal reservoirs. The fundamentals of fluid/heat flow in porous media; convective/conductive regimes, dispersion of solutes, reactions in porous media, stability of fluid interfaces, liquid and vapor flows. Interpretation of geochemical, geological, and well data to determine reservoir properties/characteristics. Geothermal plants and the integrated geothermal system.
3 units, Spr (Horne) alternate years, not given 2001-02

1-3 units, any quarter (Staff)

280. Oil and Gas Production Engineering—(Same as 180.) Design and analysis of production systems for oil and gas reservoirs. Topics: well completion, single-phase and multi-phase flow in wells and gathering systems, artificial lift and field processing, well stimulation, inflow performance. Prerequisite: 120. Recommended: 130. (WIM)
3 units, Aut (Kovscek, Aziz)

3 units (Horne) alternate years, given 2001-02

3 units, Aut (Caers)

285A,B,C,D,E,F,G. Research Seminars—Focused study in research areas within the department. Graduate students may participate in advanced work in areas of particular interest prior to making a final decision on a thesis subject. Prerequisite: consent of instructor.

285A. Research Seminar: Enhanced Oil Recovery—Current research in the SUPRI-A group. Thermal and enhanced oil recovery. (AU)
1 unit, Aut, Win, Spr (Kovscek, Castanier, Brigham)

285B. Reservoir Simulation—Current research in SUPRI-B (Reservoir Simulation) program. (AU)
1 unit, Aut, Win, Spr (Aziz, Durlofsky, Edwards)

285C. Research Seminar: Gas Injection Processes—Current research in the SUPRI-C group. (AU)
1 unit, Aut, Win, Spr (Orr)

285D. Research Seminar: Well-Test Analysis—Current research in the SUPRI-D well test analysis group. (AU)
1 unit, Aut, Win, Spr (Horne)

285F. Research Seminar: Geostatistics—Current research in the SCRF (Stanford Center for Reservoir Forecasting) program. (AU)
1 unit, Aut, Win, Spr (Journel, Hewett, Caers)

285G. Research Seminar: Geothermal Reservoir Engineering—Current research in the geothermal energy group. (AU)
1 unit, Aut, Win, Spr (Horne)

285H. Research Seminar: Horizontal Well Technology—Current research in SUPRI-HW (productivity and injectivity of horizontal wells) program. (AU)
1 unit, Aut, Win, Spr (Aziz, Durlofsky)

355. Doctoral Report on Energy Industry Training—Provides on-the-job training for doctoral students under the guidance of experienced, on-site supervisors. Students must submit a concise report detailing work activities, problems, assignments, and key results. Prerequisite: consent of adviser.
1 unit, Sum (Staff)

359. Teaching Experience in Petroleum Engineering—On-the-job training in teaching petroleum engineering. Student prepares and presents several lectures, problem sets, grades problems, and prepares lab experiments under the supervision of regular instructor. Performance is evaluated by students and the regular instructor.
1-3 units, any quarter (Staff)

360. Advanced Work in Petroleum Engineering—Graduate-level work in experimental, computational, or theoretical research.
1-9 units, any quarter (Staff)

1-6 units, any quarter (Staff)

362. Engineer’s Thesis Research in Petroleum Engineering—Graduate-level work in experimental, computational, or theoretical research. Advanced technical report writing. Limited to 15 units total, or 9 units total if 6 units of 361 were previously credited.
1-9 units, any quarter (Staff)

1-9 units, any quarter (Staff)

1-15 units, any quarter (Staff)
School of Education


Dean: Deborah J. Stipek (after January 1, 2001)
Interim Dean: Denis C. Phillips (Summer)
Associate Dean for Academic Affairs: Denis C. Phillips
Associate Dean for Administration: Vicki Oldberg
Associate Dean for External Relations: Patricia Nicholson


Associate Professors: Arneha Ball, Joanne T. Boaler, Patricia J. Gumport, Teresa C. LaFrancoise, David Rogosa, Daniel Schwartz

Assistant Professors: Anthony L. Antonio, Brigid J. Barren, Mike Copernus, Leta L. Cosentino, Linda Darling-Hammond, Karen E. Mundy, Deanne R. Perez-Granados, Nathaniel L. Gage*, Alvin Hannum, Kemal Haji, Charles J. Haertel, Jeffrey E. Hilsenrath, Catherine J. Hinds, Philip A. James, Robert Reich

Consulting Professors: Robert Reich

Senior Lecturer: Philip Hubbard

Lecturers: Margaret Azevedo, Colin Haysman, Cathy Humphreys, James Montoya, Celia Moreno, Kathleen Morrison, Denis C. Pope, Ann Porteus, Susan Schultz, Lee Swanson, Ann Vosovic, Lori White

Acting Assistant Professors: Susan Christopher, Diana Rhoten

Consulting Professors: George Bohnstedt, Jay Chambers, David Pettermann, John W. Gardner, Jr., Thomas Parrish

Consulting Associate Professor: Charla Rolland Shelton

Visiting Professors: Paul Black, Joshua A. Fishman, Ann Lieberman, Sheldon Rothblatt

* Recalled to active duty.

The School of Education prepares scholars, teachers, teacher educators, counseling psychologists, policy analysts, evaluators, researchers, administrators, and other educational specialists. Four graduate degrees with specialization in education are granted by the University: Master of Arts, Master of Science in Education, Master of Education, and Doctor of Philosophy. While no undergraduate majors are offered, the school provides a number of courses for undergraduates, an undergraduate honors program, and a variety of tutoring programs.

The School of Education is organized into three Program Area Committees: Curriculum Studies and Teacher Education (C&TE); Psychological Studies in Education (PSE); and Social Sciences, Policy, and Educational Practice (SSPEP).

In addition, four cross-area programs are sponsored by faculty from more than one area. These programs include the doctoral Symbolic Systems Program and three master's level programs: the Stanford Teacher Education Program (STEP); the Prospective Principals Program (PPP); and the Learning, Design, and Technology Program (LDT).

These committees and programs function as administrative units that act on admissions, plan course offerings, assign advisers, and determine program requirements. Various subspecialties or concentrations exist within most of these areas and programs. Faculty members are affiliated primarily with one area but may participate in several programs. While there is a great deal of overlap and interdisciplinary emphasis across areas and programs, students are affiliated with one area committee or program and must meet its degree requirements.

Detailed information about admission and degree requirements, faculty members, and specializations related to these area committees and programs can be found in the publication School of Education Guide to Graduate Studies and at http://www.stanford.edu/dept/SUSE.

The School of Education offers an eight-week summer session for admitted students only. The school offers no correspondence or extension courses.

UNDERGRADUATE PROGRAMS

The School of Education focuses on graduate education and research training and does not offer an undergraduate major. However, undergraduate education is of concern to the school, and courses and programs are available to those interested in the field of education. Several courses at the 100 level are especially designed for undergraduates, and some higher-level courses are open to undergraduates. An honors program is available to undergraduates to supplement their regular majors outside the school. In conjunction with the Haas Center and the Undergraduate Advising Center, the school offers a variety of courses for undergraduates interested in developing educationally oriented skills.

HONORS PROGRAM

This program permits interested and able undergraduates at Stanford to build on the training received in their major field of study by pursuing additional courses and a research or practicum project in a related area of education.

Students apply for entry during the junior year. Applications are available at the Dean's office in Cubberley, room 101, or at http://www.stanford.edu/dept/SUSE/navigations programsnavfrm.html. At least one course must be taken from each of the following areas:

1. Educational policy and history in the U.S.: courses include American Education and Public Policy; History of Education in the United States; Children, Civil Rights, and Public Policy in the U.S.; Introduction to the Study of International Comparative Education; History of Higher Education in the U.S.

2. Contemporary problem areas: courses include Urban Youth and Their Institutions: Research and Practice; Theory and Issues in the Study of Bilingualism; Education and the Status of Women: Comparative Perspectives; Contemporary Social Issues in Child and Adolescent Development.

3. Foundational disciplines: courses include Social Sciences and Educational Analysis; Problems in Sociology of Education; Problems of Intelligence, Information, and Learning; Introduction to Philosophy of Education.

A directed reading course as well as directed research courses with a faculty member in Education is also required. Students in the program should enroll in the Undergraduate Honors Seminar, 199A,B,C during their senior year.

Near the end of Spring Quarter, successful candidates for honors orally present brief reports of their work and findings at a mini-conference. All honors students in Education are expected to attend this conference.

COTERMINAL DEGREE PROGRAM

The School of Education admits a small number of students from undergraduate departments within the University into a coterminous A.B. and A.M. program. Not all of the four area committees offer coterminous degrees. Students in such a program receive the bachelor's degree in their undergraduate major and the master's degree in Education. Approval of the student's undergraduate degree and of the School of Education is required. Undergraduates may apply when they complete 105 units, but no later than the end of the 11th quarter of undergraduate work. Students study for both the bachelor's and master's degrees simultaneously and must complete a total of 15 full-tuition quarters or three full-tu-
The minimum unit requirement is 36 quarter units earned at Stanford as the School of Education's Academic Services Office. Coterminal applicants require within the School of Education; the minimum is 36 units. Applicants may obtain coterminal degree application materials from the School of Education's Academic Services Office. Coterminal applicants may also consult with Graduate Admissions regarding eligibility.

**GRADUATE PROGRAMS**

Several advanced degree programs are offered by the School of Education and are described below. Requirements vary somewhat across programs. Both University and School of Education requirements must be met for each degree. The University requirements are detailed in the "Graduate Degrees" section of this bulletin. Students are urged to read this section carefully, noting residency, tuition, and registration requirements. A student who wishes to enroll for graduate work in the School of Education must be qualified and admitted to graduate standing by one of the school's area committees.

Complete information about admissions procedures and requirements is available by writing Stanford University Graduate Admissions, Old Union, Room 137, Stanford, CA 94305-3005 or at http://www.stanford.edu/dept/SUSE/. The admissions packet includes the publication *School of Education Guide to Graduate Studies*, which outlines degrees, programs, admission and graduation requirements, and research interests of the faculty. All applicants must submit scores from the Graduate Record Examination General Test (verbal, quantitative, and analytical areas); TOEFL scores are also required from those whose first language is not English.

**MASTER OF ARTS**

The A.M. degree is conferred by the University upon recommendation of the faculty of the School of Education and the University Committee on Graduate Studies. The University residency requirement is three full-tuition quarters of registration as a graduate student at Stanford. The minimum unit requirement is 36 quarter units earned at Stanford as a graduate student. Some programs require as many as 45 units. At least 12 units must be taken for a grade point average (GPA) of 'B' or better, and a minimum of 18 units must be taken in the School of Education. Master's students should obtain detailed program requirements from the master's coordinator, located in Academic Services in the School of Education. No thesis is required to earn a master's degree; however, some programs require a final project, paper, or monograph. Additional detailed information regarding entrance and degree requirements is available at http://www.stanford.edu/dept/SUSE/ and in the School of Education Guide to Graduate Studies. Upon admission, each student is assigned a faculty adviser from the appropriate area committee to begin early planning of a coherent program. Master of Arts degrees are offered for the following specialties (the sponsoring area committee and concentration is listed in parentheses):

- Art Education (C&TE)
- Dance Education (C&TE)
- English Education (C&TE)
- Evaluation (SSPEP-APA)
- General Curriculum Studies (C&TE)
- International Comparative Education (SSPEP-ICE)
- International Educational Administration and Policy Analysis (SSPEP-ICE)
- Joint Program with Graduate School of Business (SSPEP-APA)
- Learning Design and Technology (Cross-Area)
- Mathematics Education (C&TE)
- Policy Analysis (SSPEP-APA)
- Prospective Principals Program (SSPEP-APA)
- Science Education (C&TE)
- Social Sciences in Education—Interdisciplinary (SSPEP-SSE)*
- Teacher Education (C&TE)

* Within this program, students may pursue interests in gender issues, language, and social science areas represented in SSE.

In addition, an A.M. degree with a teaching or administrative credential is offered in Stanford Teacher Education Program (Cross-Area—STEP).

**STANFORD TEACHER EDUCATION PROGRAM (STEP)**

STEP offers a Master of Arts program to prepare humanities and sciences college graduates for careers as secondary teachers of English, languages (French, German, Japanese, Spanish), mathematics, science (biology, chemistry, physics), and social studies. To be successful in classrooms with diverse students, STEP helps participants become more aware of their values, more flexible in their teaching and learning styles, and more knowledgeable in their subject matter.

The 12-month STEP year begins in June with a summer quarter of intensive academic preparation and experience in the Stanford Summer Teaching School. During the academic year, students take courses in professional education and academic subjects; they also teach part-time in middle or high schools for the entire public school year. The master's degree and Single Subject (secondary) Teaching Credential require 45 quarter units, taken during four quarters of continuous residency.

Applicants are required to pass the California Basic Educational Test (CBEST), and must demonstrate subject matter competence in one of two ways: (1) by passing the Praxis II and SSAT subject assessment tests in their field, or (2) by completing a California state-approved subject matter preparation program. For further information, contact STEP Academic Services at (650) 723-2110.

STEP also includes the optional California Cultural Language and Academic Development (CLAD) emphasis program. CLAD provides enhanced opportunities for candidates to learn about and work with linguistically and ethnically diverse students. The program focuses on theories of language acquisition, English as a second language methodologies, and development of cross-cultural understanding and appreciation of multicultural diversity. Further information regarding admission requirements, course work, and credential requirements is available at http://www.stanford.edu/dept/SUSE/ and in the School of Education Guide to Graduate Studies.

**PROSPECTIVE PRINCIPALS PROGRAM (PPP)**

The Prospective Principals Program at Stanford offers the A.M. degree with a specialization in Administration and Policy Analysis, which can be combined with the Preliminary Administrative Services Credential. It enables prospective principals to become leaders and to manage ideas, resources, and themselves to achieve worthwhile educational results for a diverse student population. This is accomplished through three consecutive summers of full-time study and is therefore available to persons working in a school system during the academic year. Teaching experience is a prerequisite for admission to this program. This master's degree requires 45 quarter units. In order to qualify for the credential, three additional quarter units for a total of 48 quarter units, including internship units, are necessary. Additional information regarding admission requirements, course work, and credential requirements is available in the School of Education Guide to Graduate Studies.

**MASTER OF ARTS IN TEACHING (SUBJECT)**

The degree of Master of Arts in Teaching (M.A.T.) is reserved for experienced teachers or individuals who have completed a program of teacher preparation; it is offered in conjunction with a variety of academic departments in the School of Humanities and Sciences. Further details are available from the A.M. programs office in the School of Education.

**DOCTORAL DEGREES**

The School of Education offers two types of doctoral degrees. The Doctor of Philosophy (Ph.D.) degree is offered by all program area committees. The Doctor of Education (Ed.D.) degree is offered only in the concentrations of Policy Analysis and Higher Education Administration within the area of SSPEP. Both degrees are conferred by the University upon recommendation by the faculty of the School of Education and the University Committee on Graduate Studies. University residency requirements (nine full-tuition quarters or the equivalent), amount of trans-
The two doctoral degrees offered in the School of Education differ in emphasis, purpose, and the intended careers of those who pursue them. They are equivalent with respect to the amount of time required and the rigor and quality of work demanded. In the Ph. D. degree program, there is greater emphasis on theory and research; the emphasis in the Ed.D. program is on informed and critical applications of existing knowledge to educational practice.

The Ph.D. degree is designed for students who are preparing for (1) research work in public school systems or specialized institutions; (2) teaching roles in education in colleges or universities, and research connected with such teaching; or (3) other careers in educational administration and research.

The Ed.D. degree is a professional educational degree intended to meet the needs of (1) those who wish a thorough and comprehensive professional understanding of and competence in dealing with educational problems met by administrators, supervisors, and curriculum specialists; and (2) those who wish a scholarly preparation for teaching education in colleges or universities.

Ph.D. students must complete a minor in another discipline taught outside the school, or hold an acceptable master’s degree outside the field of education, or complete an approved distributed minor that combines relevant advanced work taken in several disciplines. A minor is not required for the Ed.D.

Upon admission, an adviser assigned from the admitting area committee works with the student to establish an appropriate and individualized course of study, a relevant minor, and project research plans. Other faculty members may also be consulted in this process. Details about the varying administrative and academic requirements for each area committee and the School of Education, along with general time frame expectations, are given at http://www.stanford.edu/dept/SUSE/ and in the School of Education Guide to Graduate Studies. Complete guidelines may be obtained from the specific area committees.

The following courses are offered by the Undergraduate Advising Center (UAC). The UAC provides and coordinates services to help student and adviser work together toward the establishment and accomplishment of the student’s academic and personal goals. For detailed description of services and advising resources, see http://uac-server.stanford.edu/.

The UAC is on the first floor of Sweet Hall, and is open Monday through Friday 9:00 a.m. to 12:00 noon and 1:00 to 5:00 p.m., telephone: (650) 723-2426.

50. Accelerated Learning—Interactive, providing various methods for approaching difficult concepts which cannot be comprehended even after multiple efforts. The techniques for active learning, making it possible to accelerate the process of conquering difficult concepts while also achieving higher levels of understanding. Learn how to identify your individual style and channels, practice locating areas of confusion, and formulate workable, individualized approaches.

1 unit, Aut, Spr (Townsend)


1 unit, Win (Matthies, Worline)

52. Practices in Critical Thinking—Critical thinking is one of the most important skill sets we need to be successful in college and in the workplace across subject areas. It encompasses knowing how to find assumptions, recognize ambiguity, evaluate arguments, and judge the credibility of sources of expert opinion. To think critically in one’s daily
life and studies requires being comfortable with questions instead of answers, complexity instead of simplicity, uncertainty instead of certainty. These abilities are developed through practical exercises based on contemporary issues and through practice with tests from a variety of disciplines. Emphasis is on the value of developing a questioning mind and the importance of differentiating between academic and intellectual motivation.

3 units, Sum (Townsend)

53. Working Smarter through Precision Questioning—When life-long reading or classroom work is driven by questions, concentration is better, recall is more complete, motivation improves. Understanding the basic categories of questions and their interrelationships enables us to be more precise, better organized, and more critical. In-class exercises provide incrementally complex question ladders and increase skills in delivering questions and answers.

2 units, Win (Townsend)

54. Reading Faster—Coping with information overload requires speed reading as it traditionally has been defined, and the ability to overview, skim, extract, browse, and navigate through hypertext. To decide what is worth reading, quick and reliable judgments must be made about relevance and credibility. Academic texts, technical manuals, major newspapers, etc.

1 unit, Aut, Spr (Townsend)

55. Think On Your Feet—Learn how to be effective in small group discussions; quickly grasp the point being made, the supporting arguments, and the nature of the responses to arguments on the other side of the question. Increase your capacity for effective teamwork through in-depth, collaborative thinking exercises. Practice presenting your ideas to your peers and colleagues so that you are prepared to take advantage of Stanford’s numerous small group courses.

2 units, Win (Townsend)

EDUCATION

955. Issues in Leadership—Priority given to undergraduates and master’s degree students. Basic theories and concepts in leadership and group process. Topics: identification of core values, building shared vision, group problem solving, leadership styles, decision-making, power and influence, conflict management, ethical dilemmas, community building, and personal policy development. Interactive and experiential, and for students currently in leadership positions in the University or who have jobs or volunteer roles where they are working in groups. Enrollment limited to 24. (SSPEP)

3-4 units, Win (Porteus)

102. Culture, Class, and Educational Opportunity—Upward Bound and EPASSA counselors work with students from educationally disadvantaged backgrounds. Topics: language education, culture and family, class management, school finance, and community-school relations. Mandatory school visits and classroom observations. Enrollment limited to 15. (SSPEP)

4 units, Spr (Padilla)

106. Interactive Media in Education—Introduction to the use of interactive media in formal education. Workshop views/uses commercial interactive media for education and analyzes/criticizes them. Ideas are used to interpret/understand the experience of learning with interactive media. (CTE)

3-5 units, Sum (Walker)

107. The Politics of International Cooperation in Education—for undergraduates and master’s students; see 306B.

3-4 units, Spr (Mundy)

109X. The Politics of Language Education in California Schools—Controversies surrounding language and educational policies pertaining to African Americans and English language learners are explored in the wake of legislation that was formulated to restrain curricula for language minority students throughout California. Interdisciplinary studies of language in schools and society are compared to legislation and educational policies within their historical and political contexts.

3-4 units, Win (Bough)

120. Symbolic Systems Seminar: Problems in Intelligence, Information, and Learning—Interdisciplinary topics in cognitive science, e.g., modularity, representation, reasoning, situated action, or creativity. Prerequisites: Computer Science 109, Linguistics 120 or 130, Philosophy 80, Psychology 40, or consent of instructors.

3 units (Green, Wasow) not given 2000-01

130. Introduction to Counseling—The theories and techniques of counseling, emphasizing the clients’ individual and cultural differences, and construction of one’s own theory of the counseling process and outcome. Two psychotherapeutic theories, cognitive-behavioral and existential-humanistic, are supplemented with a third theory of each student’s choice. Experiential, problem-based focus on how to develop self-awareness and conceptual understandings of the counseling process in culturally diverse contexts. (PSE)

3 units (Staff) not given 2000-01

136. World, Societal, and Educational Change: Comparative Perspectives—See 306D. (SSPEP/ICE)

4-5 units (Ramirez) not given 2000-01

137Q. Stanford Introductory Seminar: Conceptualizing Human Motivation—East and West—Preference to sophomores. What motivates behavior? This question is linked to one’s view of human nature and the relationship between individuals and their social worlds. The multiple perspectives on human motivation, including Western psychological traditions and the contemplative spiritual psychologies of the East. Historical and cross-cultural approaches to understanding how different traditions treat motivation. Readings from personality, clinical, and developmental psychology, and from Eastern psycho-spiritual traditions such as Buddhism and yoga. How world views of human nature and development are related to theories of human motivation. Prerequisite: introductory psychology.

3 units, Spr (Roeser)

138Q. Stanford Introductory Seminar: Educational Testing in American Society—Preference to sophomores. Tests are used for college admissions, program evaluation, and educational reform. In the classroom, grades are used to communicate about achievement, and sometimes to reward effort, improvement, or good behavior. Explanations for group and individual differences in test performance have been controversial this century, right up to current debates over affirmative action. The purposes and the logic of various testing programs, including classroom testing, admissible testing, and national testing programs. The meanings of reliability, validity, bias, and fairness in testing, developing the notion of validity argument as a conceptual tool for analyzing testing applications. Paper on some educational testing application.

3 units (Haertel) not given 2000-01

141. Race, Education, and the Media—See 241. (SSPEP/APA)

5 units (Carnoy, Steyer) not given 2000-01

149. Theory and Issues in the Study of Bilingualism—For undergraduates; see 249.

3-4 units, Aut (Valdés)

150X. Introduction to Data Analysis and Interpretation—Primarily for master’s students. Provides rudimentary data analysis skills with a focus on reading literature and interpreting statistics and statistical models, especially those commonly found in education. Topics: descrip-
tive statistics and displays, simple and multiple regression, contingency tables, t-test, and simple analysis of variance.

4 units, Aut (Porteus)

151X. Introduction to Qualitative Research Methods—Primarily for master’s students. Introduces students to issues, leading ideas, and methods in qualitatively-oriented educational research. Check with the relevant instructor for more details of the syllabus.

4 units, Aut (Fetterman, Pope)
Win (Peshkin)

155. Development of Measuring Instruments—For students planning to develop written or performance tests or questionnaires for research and evaluation, and for teachers wishing to improve classroom examinations. Planning tests, writing items, item tryout and criticism, qualities desired in tests, and interview techniques. Lectures, case studies, and practical exercises. (PSE)

3 units (Haertel) not given 2000-01

156X. Understanding Racial and Ethnic Identity—African American, Native American, Mexican American, and Asian American racial and ethnic identity development is explored to better understand the influence of social/political and psychological forces in shaping the experience of people of color in the U.S. Issues: the relative salience of race in relationship to other social identity variables, including gender, class, occupational, generational, and regional identifications. Bi- and multiracial identity status, and types of white racial consciousness. GER:4b(DR-3)

5 units (LaFromboise) not given 2000-01

158. Children’s Citizenship: Justice across Generations—(Enroll in Political Science 158R.)

5 units (Reich) given 2001-02

160. Introduction to Statistical Methods in Education—(Master’s students register for 150X.) Introduction to quantitative methods in educational research for doctoral students with little or no prior statistics. Organization of data, descriptive statistics, elementary methods of inference, hypothesis testing, and confidence intervals. Computer package used. Students cannot also receive credit for Psychology 60, or for Statistics 60 or 160. (All Areas)

4 units, Aut (Hakuta)


3 units (Rogosa) not given 2000-01

164X. Developing Academic English: Methods for Teaching ESL in American High School—Introduction to theories and methods for instruction in English as a second language. Broad overview of approaches and methods used in language teaching focusing specifically on practices that can support the development of those language proficiencies needed by non-English-background students in order to succeed in American schools. (CTE-STEP)

2-4 units (Valdes) not given 2000-01

165X. History of Higher Education in the U.S.—(Same as 265X.) Introduction to historical perspectives on the development of higher education. Readings/discussions address the major periods of evolution, emphasizing the mid-19th century. Premise: insights into contemporary higher education can be obtained by examining its antecedents, particularly issues of governance, mission, access, curriculum, and the changing organization of colleges and universities. (SSPEP-APA)

3-5 units, Win (Rothblatt)

166X. Teaching Reading, Writing, and the Language Arts—For STEP students. Focus is on the application of and psychological principles in understanding, assessing, and supporting the reading and writing processes, and the acquisition of literacy, especially in secondary school settings. Key concepts: language acquisition, perception, cogniton, motivation, and individual differences. (STEP)

3 units, Sum (Ball)

167X. Educating for Equity and Democracy—Introduction to the theories and practices of equity and democracy in education. How to think about teaching and schooling in new ways; the individual moral and political reasons for becoming a teacher. (STEP)

3 units, Sum (Staff)

170. Gender and Education—The concept of gender in educational contexts, focusing on formal schooling from elementary to graduate education, primarily within the U.S. What gender differences exist, what difference gender makes in various educational settings. Lecture/discussion and group activity formats consider the relationship between gender and education from social science perspectives. The advantages and disadvantages of different kinds of research about gender and education using data that are ethnographic, experimental, historical, statistical, and narrative. (SSPEP)

4 units, Aut (Christopher)


177X. Education of Immigrant Students: Psychological Perspectives—(Same as 277X.) Historical and contemporary approaches to educating immigrant students. Case study approach focuses on urban centers to demonstrate how stressed urban educational agencies serve immigrants and native-born U.S. students when confronted with overcrowded classrooms, controversy over curriculum, current school reform movements and government policies regarding equal educational opportunity. (SSPEP)

4 units, Win (Padilla)

179. Urban Youth and their Institutions: Research and Practice—(Same as 279.) The determinants and consequences of urban life for youth, emphasizing disciplinary and methodological approaches to the study of policies and practices and the growing gap between the perspectives of state and local organizations and those of youth and their communities. The diversity of urban youth experiences with respect to ethnicity, gender, and immigration histories: case studies illustrate civic-level and grassroots institutions, their structures, networks, and philosophies; historical and contemporary examination of diverse realities of urban youth for policymakers, educators, and researchers. Enrollment limited. Prerequisite: consent of instructor. (SSPEP/APA)

3-4 units, Aut (McLaughlin)

180. Directed Reading in Education—For undergraduates and master’s degree students. (All Areas)

1-15 units, any quarter (Staff)

190. Directed Research in Education—For undergraduates and master’s degree students. (All Areas)

1-15 units, any quarter (Staff)

192A. Peer Tutor Training—Readings/discussions of videotapes, and individual and group projects. Topics: problem-solving, study skills, effective listening and feedback, cross-cultural sensitivity; and teaching with questions. Short internship required for new tutors.

1 unit, Aut, Spr (Freeman)

192B. Peer Tutoring in Writing—Writing tutors become familiar with the written work of fellow students and learn how to comment on it helpfully. Tutoring skills are developed through listening to experienced tutors; reflecting on our own writing processes; considering sample
writing projects; role-playing tutoring situations; and discussing reading, assignments, and projects.

2 units, Spr (Freeman)

193A. Peer Counseling: Bridge Community—Instruction in peer counseling. Topics: verbal and non-verbal skills, the use of open and closed questions, paraphrasing, working with feelings, summarization, and integration. Lectures, individual training, group exercises, role-play practice with optional video feedback. Sections on the relevance to crisis counseling and student life. Guest speakers from university and community agencies. Students develop and apply skills in a variety of settings in the University.

2 units, Aut, Win (Moreno)

193B. Peer Counseling: Chicano Community—Instruction in basic counseling. Topics: verbal and non-verbal attending and communication skills, the use of open and closed questions, working with feelings, summarization, and integration. Counseling issues that may be salient when working with Chicanos, including the significance and process of Spanish-English code switching in communication, the role of ethnic identity in self-understanding, the relationship of culture to personal development, and the experience of Chicano students in university settings. Lectures, individual training, group exercises, discussion, role-play, and videotape practice.

2 units, Aut (Martinez)

193C. Peer Counseling: The African-American Community—Instruction in peer counseling with Blacks. Topics: the concept of culture, Black cultural attributes and their effect on Blacks’ reactions to accepting counseling, verbal and non-verbal attending, the use of open and closed questions, working with feelings, summarization, and integration. Geared toward counseling with Blacks; methods of instruction include reading assignments, lectures, guest speakers, group discussion, role-play, and videotaped practice. Students develop and apply skills in the Black community on campus or in other settings that the student may choose.

2 units, Aut (Edwards, Reed-Hoskins)

193F. Peer Counseling: The Asian American Community—Topics: the Asian family structure, concepts of identity, ethnicity, culture, and racism in terms of their impact on individual development and the counseling process. Emphasis is on the development of an appreciation and empathic understanding of Asians in America. Lectures, readings, discussion, and group exercises.

2 units, Win (Brown)

193N. Peer Counseling in the Native American Community—Instruction in basic counseling techniques. Topics: verbal and non-verbal communication, strategic use of questions, methods of dealing with strong feelings, and conflict resolution. Emphasis is on how basic elements of counseling apply to Native Americans, including client, counselor, and situational variables in counseling, the significance of non-verbal communication, the role of ethnic identity in self-understanding, the relationship of culture to personal development, the impact of family on personal development, gender roles and Native American families, and the experience of Native American Indian students in university settings. Lectures, individual skill development, group exercises, and role practice.

2 units, Win (Simms, Martinez)

193P. Peer Counseling Practicum—For those who continue to study counseling methods while counseling students.

1-5 units, Aut, Win, Spr (Moreno)

194. Leadership in Academic Advising—Focus is on the skills needed to be an active leader in the academic advising process through the role of Head Advising Associate, taught simultaneously with the HAA selection process through the Undergraduate Advising Center. Student development theory as it applies to the advising process for freshmen and sophomore students. Workshops, focus groups, guest speakers, role playing, and case studies develop listening and counseling skills, ask critical questions, and learn about group facilitation. Corequisite: students must be applying for the position of Head Advising Associate for 2000-01.

2 units, Aut, Spr (Freeman)

196X. Feminist Theories of Work and Families—(Same as Feminist Studies 102L) A critical introduction to feminist theories of work, families, and the interactions between the two. The economic, sociological and legal perspectives; mainstream and feminist theories are contrasted. Emphasis is on the present day U.S. with issues in other countries and/or other historical periods. Topics: labor force participation, occupational segregation, labor market discrimination, emotional labor, unpaid work, caring labor, child care, combining work and family, single-parent families, poverty, marriage, and divorce.

4-5 units, Win (Freeman)

197. Education and the Status of Women: Comparative Perspective—Theories and perspectives from the social sciences relevant to understanding the role of education in changing, modifying, or reproducing structures of gender differentiation and hierarchy. Cross-national research on the status of women and its uses to evaluate knowledge claims from varying perspectives. (SSPEP) GER:4c (DR:1)

4-5 units, Win (Wotipka)

199A, B, C. Undergraduate Honors Seminar—Required for all juniors and seniors in the honors program in the School of Education. Supports students’ actual involvement and apprenticeships in educational research. Participants are expected to share ongoing work on their honors thesis. Prerequisite: consent of instructor.

1 unit, Aut, Win, Spr (Powell)

200. The Work of Art and the Creation of Mind—Collaboration between the Art, Dance, Drama, and Music programs, and the School of Education examines the relationship between the work of art and the creation of mind, i.e., the work of art as a task of making something and as a form that has been made. The ways a conception of art develops and defines the mind. Discussion, readings, and observation of artists at work. The relationship between forms of art and forms of thought. What does either the perception or creation of art in any of its forms do to how we think and know? (CTE)

4 units, Win (Hannah, Rehm, Ross, Sano)

201. History of Education in the United States—Analysis of selected turning points in education in relation to religion, political socialization, race relations, gender, immigration, and urbanization. Limited enrollment. (SSSEP)

3 units, Aut (Williamson)

201A. History of African American Education through 1940—A survey of pivotal points in African American educational history, including literacy attempts during slavery, the establishment of historically Black colleges and universities, the debate between liberal and vocational education, and Black student rebellions on campuses. (SSSEP)

3 units (Williamson) given 2001-02

201B. Education for Liberation—Focusing on African Americans, investigates how education has been employed to advance group self-determination and autonomy from the 1954 Brown decision to contemporary Afro-centric/African-centered educational initiatives. (SSSEP)

3 units (Williamson) given 2001-02

202. Introduction to Comparative and International Education—Introduction to the field of comparative and international education. Contemporary theoretical debates about educational change and development, and the international dimension of several contemporary issues in education. Emphasis is on the development of students’ abilities to
make cross-national and historical comparisons of educational phenomena. (SSPEP/ICE)
  4-5 units, Aut (Mundy)

202I. Education Policy Workshop in International and Comparative Education—Project-based workshop for students in International and Comparative Education, providing a practical introduction to key issues in educational policy making, educational planning, implementation, and the role of foreign expertise/consultants in developing country contexts. (SSPEP/ICE)
  2-3 units, Aut (McDermott)

203X. Education and Inequality in American Culture—Overview of the cultural production of inequalities in school performance by class, race, ethnicity, gender, and individual style. Students exploring the same themes in small group discussions enroll in 220Y for additional 2 units.
  2 units, Aut (Mundy)

203Y. Discussion: Education and Inequality in American Culture—Small group discussions of competition and unequal access in notable American texts. Corequisite: 203X.
  2 units, Aut (McDermott)

204. Introduction to Philosophy of Education—Introduces current approaches and techniques in the philosophy of education; material has been selected for its general relevance to students of education. Feminist and radical theories of education. Introductory philosophical material is presented in the context of educational issues. (SSPEP)
  3 units, Aut (Callan)

205. Group Counseling—Develops the ability to identify and understand the interpersonal processes in a small group. First-hand experiences simulate group processes that can be examined and conceptualized. Prerequisite: consent of instructor.
  1-4 units (Staff) not given 2000-01

206A. Applied Research Methods in International and Comparative Education I: Introduction—Required for all A.M. students in ICE and IEAPA, others by consent of instructor. Orientation to the A.M. program and research project, exploration of resources for study and research. (SSPEP/ICE)
  1 unit, Aut (Rhoten)

206B. Applied Research Methods in International and Comparative Education II: The Master's Monograph Proposal—Required for all A.M. students in ICE and IEAPA; others by consent of instructor. Development of research skills through discussion of theoretical and methodological issues in comparative and international education. Preparation of a research proposal for the A.M. monograph. (SSPEP/ICE)
  3-5 units, Win (Rhoten)

206C. Applied Research Methods in International and Comparative Education III: Master's Monograph Workshop—The conclusion of the four-quarter A.M. program in ICE and IEAPA, required of all A.M. students. In-depth reviews of students' research in preparation for the completion of their master's monograph. (SSPEP/ICE)
  3-5 units, Sum (Rhoten)

208B. Curriculum Construction—The theories and methods of curriculum development and improvement. Topics: curriculum ideologies, perspectives on design, strategies for diverse learners, and the politics of curriculum construction and implementation. Students develop curriculum plans for use in real settings. (CTE)
  3 units, Win (Pope)

209X. The Politics of Language Education in California Schools—(Same as 109X.)
  3-4 units, Win (Baugh)

210. Problems in Sociology of Education—(Meets with 310; same as Sociology 232/230.) Introduction to sociological approaches to educational phenomena. Topics: school organization and environment, the relationship of education to adult roles, the impact of social class and ethnicity on classroom learning, and the social structure of the classroom. Read/evaluate social sciences research. Short written assignments and individual feedback. (SSPEP)
  4 units, Spr (McFarland)

211. Master's Seminar in Social Sciences in Education—Limited to master's students in SSE. Directed, hands-on forum for SSE students to critically examine the process of developing and shaping a research program, integrating it with academic and field experiences, and building relationships beyond the program. Students conceptualize their projects and focus on researchable topics: effective revising and editing, job searches, working with your adviser, "what next?," or a celebration of achievements so far. (SSPEP)
  1 unit, Aut, Win, Spr (Christopher)

213. Aesthetic Foundations of Education—What role might the arts play in education? Do the arts contribute to the development of cognitive skills? Do they help humans understand the world in which they live? Are aesthetic considerations central in the way we think about the aims of education? Do they enhance teaching and school organization? (CTE)
  4 units, Aut (Ross)

214. Popper, Kuhn, and Lakatos—(Same as Philosophy 156.) Popper, Kuhn, and Lakatos are 20th-century philosophers of science who have raised fundamental issues dealing with the nature of scientific progress: the rationality of change of scientific belief—science vs. non-science; the role of induction in science, truth, or verisimilitude as regulative ideals. Their impact in the social sciences and applied areas such as educational research. (SSPEP)
  3 units, Spr (Phillips)

219. Artistic Development of the Child—How can children's and adolescents' development in the arts be described? What role does the symbolic transformation of experience play in the creation of those images we regard as art? What can teachers do to promote the development of artistic thinking? These and other questions are examined through the study of theory and research conducted within the social sciences. (CTE)
  4 units (Eisner) not given 2000-01

220A,B,C,D,Y. The Social Sciences and Educational Analysis—Required of students in APA and open to all. Economics, political science, sociology, and history, and their applications to education in the U.S.

220A. The Social Sciences and Educational Analysis: Introduction to the Economics of Education—Overview of the relationship between education and economic analysis. Topics: labor markets for teachers, the economics of child care, the effects of education on earnings and employment, the effects of education on economic growth and distribution of income, and the financing of education. Students who lack training in micro-economics enroll in 220Y for one additional unit of credit. (SSPEP/APA)
  4 units, Win (Loeb)

220B. Introduction to the Politics of Education—The relationships between political analysis and policy formulation in education; focus is on alternative models of the political process, the nature of interest groups, political strategies, community power, the external environment of organizations, and the implementations of policy. Applications to policy analysis, implementation, and politics of reform are emphasized. Prerequisite: Political Science or Public Policy major, or student in SSPEP. (SSPEP/APA)
  4 units, Spr (Kirst)

220C. Education and Society—(Same as Sociology 130.) The effects of schools and schooling on individuals, the stratification system, and
society. Education as socializing individuals and as legitimizing social institutions. The social and individual factors affecting the expansion of schooling, individual educational attainment, and the organizational structure of schooling. (SSPEP/APA) GER: 3b (DR:9)

5 units, Win (Meyer)

220D. History of School Reform: Origins, Policies, Outcomes, and Explanations—Restricted to graduate students and undergraduates planning to work on honors theses in education or in directly related areas. Focus is on school reform in the U.S. during the last 50 years. Reform and practice in other nations for comparative purposes. Topics: theories of reform; school choice; academic standards and systemic reform; civil rights issues including racial and social integration, and the education of limited English speaking students; governance approaches; and the implementation of reform. Why and how some school reforms persist, why some fail or fade, and why some recur periodically. Students investigate a particular reform: its sources, policy development and implementation, and the consequences, intended and unintended, using one or more of the analytic frameworks presented. (SSPEP/APA)

4 units, Aut (Smith)

220Y. Introduction to the Economics of Education: Economics Section—Introduction to micro-economics for those taking 220A who have not had micro-economics before or who need a refresher. Corequisite: 220A. (SSPEP/APA)

1-2 units, Win (Loeb)

221A. Policy Analysis in Education—Major concepts associated with the development, enactment, and execution of social policy. Issues of policy implementation, agenda setting and problem formulation, coalition politics, and intergovernmental relations are examined through case materials and supplementary readings. Objective: identify and understand the factors that affect the ways in which analysts and policymakers learn about the policy system and the ways in which they can influence it. Enrollment limited. Prerequisite: consent of instructor. (SSPEP/APA)

4-5 units, Win (McLaughlin, Darling-Hammond)

221B. Macro and Micro Issues in Policy Analysis—Provides doctoral students an opportunity to analyze the macro- and micro-dimensions of policy issues in education. Students use their own research interests to explore the analytical, empirical, and methodological aspects of these two different perspectives on policy and action.

3 units, Win (McLaughlin, Darling-Hammond)

222. Resource Allocation in Education—Problems of optimization and design, and evaluation of decision experience. Marginal analysis, educational production functions, cost effectiveness and cost-benefit analysis, constrained maximization, program evaluation. Introduction to linear models for large-scale data analysis. Implications to model assumptions. (SSPEP/APA)

4-5 units (Loeb) not given 2000-01

223. Good Schools: Research, Policy, and Practice—Recent studies of schools that exceed expectations in producing desired results. Research methodologies, findings of studies, and efforts to implement results. Components of "good" schools analyzed: effective teaching, principal leadership, organizational processes, parent involvement, cultures in schools, the role of the superintendent. Required project studies a school and determines "goodness." (SSPEP/APA, CTE)

3-4 units, Aut (Cuban)

224. Information Technology in the Classroom—The use of information technology (computers, interactive video, telecommunications) in classroom teaching. Basic computer operations and terminology; challenges of planning and teaching with technology; judging the merits of products for educational uses; survey of the types of uses made of technology in schools; and economic, social, and ethical issues, emphasizing equity. (CTE)

3 units, Win (Walker)

226. Classroom Assessment—Research on classroom testing; creating and selecting classroom tests; instructional uses of tests, performance tests, classroom observations, linking testing and instruction, using standardized test results. (PSE)

3 units (Haertel) not given 2000-01

228. Research on Reading and Reading Acquisition—For doctoral and master's students in SSPEP, PSE, CTE, and SSPEP. Focus is on the application of psychological principles in understanding the reading and writing process and the acquisition of literacy in school and non-school settings. Key concepts: psycholinguistics, perception and cognition, motivation, and individual differences. (SSPEP)

3-4 units (Kamil) not given 2000-01

229A,B,C,D. Seminar in Learning Design and Technology—Four-quarter core of the LDT master's program. Topics: learning, cognition, and development; design principles for technological learning environments; technological literacy and skills; research methods and evaluation; curriculum and content; and organization structure and operation. Students navigate one or more design sequences in learning environments rooted in a practical problem. Topics in learning, design, and technology are examined from a theoretical and a practical application perspective. Readings and hands-on development are a team-collaborative effort. (All Areas)

229A. 3 units, Sum (Walker)

229B. 3 units, Aut (Walker)

229C. 3 units, Win (Kamil)

229D. 3 units, Spr (Barron, Greeno)

230. Ethnographic and Empowerment Evaluation—The role of ethnography in addressing contemporary and socially significant issues. The value of ethnographic evaluation in educational settings. Successful strategies to effectively communicate qualitative findings with powerful policymaking bodies to improve our world, including testifying on the hill and sharing findings through the media. The role of ethnographic and empowerment evaluation in contributing to organizational transformation. (SSPEP)

5 units, Spr (Fetterman)

231X. Developing and Supporting Teaching—How do teachers learn to teach and what kinds of mentoring and coaching support helps them to develop their practice? Teaching requires the ability to make hundreds of choices and decisions daily. A strong knowledge base and skills of reflective inquiry increase the odds that all students are served in each teacher's classroom. How is the development of successful teaching supported? What does effective mentoring look like? What are some of the dilemmas and difficulties faced by mentors? The research on adult learning and learning to teach. Skills such as giving productive feedback and co-planning. Methods such as teaching videos, role-plays, reading and discussion of theory, research, and practice concerning mentoring.

3 units, Spr (Darling-Hammond)

232A. Teaching: Questions for Practice, Research, and Policy—How do we define and study teaching? What do teachers need to know, believe, and be able to do? How does teaching vary by subject matter, students, grade level? What is the relationship between teaching and learning? How do teachers learn? The research that has tackled these questions provides students with the chance to think about these and other questions of their own. (CTE)

4 units, Win (Boaler, Grossman)

232B. Introduction to Curriculum—Second of CTE core. What should American schools teach? How should school programs be organized? How can schools determine whether the goals they have formulated have been achieved? What kind of school organization helps teachers improve their teaching practices? Students secure a historical and contemporary perspective on the curriculum of American schools. The interactions among curriculum, the organizational structure of schools, the concep-
tion of the teacher's role, and the ways in which teaching and student learning are assessed. Text, video analysis of teaching, and small group discussions examine competing ideas regarding the content and aims of school programs. (CTE)

4 units, Aut (Atkin, Kiely)

232C. Introduction to Learning—Core course in CTE and PSE. The theoretical perspectives and results of research on learning, emphasizing principles that can inform the design and study of learning environments, including teaching and curriculum activities and resources. Issues: the ways of assessing learning, learning by individuals and groups who differ in gender or in cultural and social backgrounds, the generality of learning outcomes, relations between the growth of conceptual understanding and cognitive skill, learning considered as becoming a more effective participant in social practices, and a brief history of the development of currently influential conceptualizations of learning. (CTE, PSE)

4 units, Spr (Ball, Greeno, Hakuta)

233A. Counseling Theories and Interventions from a Multicultural Perspective—Review of foundational and new concepts of counseling theory and intervention from a multicultural perspective. The impact of culture on clinical presentation, relationship formation, and intervention development and evaluation in individual and group counseling. (PSE)

3 units (LaFromboise) not given 2000-01

233B. Counseling Theories and Interventions from a Multicultural Perspective, Part B—Alternative roles for multicultural counselors build on the foundational skills of individual and group counseling in 233A: adviser, advocate, facilitator of indigenous support systems, facilitator of indigenous healing systems, consultant, change agent, and counselor roles and functions in light of the client’s level of acculturation, locus of problem etiology, and goals of helping.

3 units (LaFromboise) not given 2000-01

234. Career and Personal Counseling in Culturally Diverse Settings—(Same as Psychology 237.) Methods of integrating career and personal counseling with clients and counselors from differing backgrounds. Practice with selected assessment instruments. Case studies of bicultural role conflict. Informal supervised experience. (PSE)

3 units (Krumboltz) not given 2000-01

235. Educational Policy Graduate Seminar—Enrollment limited to policy analysis and evaluation master's students. Three-quarter sequence to explore and discuss policy issues, develop educational technology skills, and prepare for employment. (SSEP/APA)

1 unit, Aut, Win, Spr (Fetterman)

236X. Education Technology Policy—Issues in education technology policy in the U.S. and selected other advanced and developing nations for K-12 and post-secondary education. Governmental policies at all levels and policies of local public and private institutions. Policy development and implementation focusing on the incentives for the private sector to become involved in education and in the consequences of the policies for low income populations. (SSEP)

3 units, Spr (Smith, Carnoy)

238A. Orientation to Counseling Psychology—For first-year counseling psychology students. Overview of the counseling psychology profession, including counseling theories, techniques, and assessment. Topics: relationship enhancement, problem conceptualization, goal setting, intervention techniques, and monitoring outcomes. Review of training tapes, role-playing, and supervision of initial counseling experiences. Prerequisite: consent of instructor. (PSE)

3 units (Krumboltz, LaFromboise) not given 2000-01

238B. Counseling and Health Psychology: Supervised Applications—For first-year counseling psychology students. Integration of counseling practice with research findings. Continuing review of training tapes, role-playing, and supervision of counseling experiences. Prerequisite: consent of instructor. (PSE)

3 units (Krumboltz, LaFromboise) not given 2000-01

238C. Counseling and Health Psychology: Supervised Applications—For first-year counseling psychology students. Advanced study of counseling theories, techniques, and assessment methods. Emphasis is on the integration of counseling practice within a research framework. Continuing review of training tapes, role-playing, and supervision of counseling experiences. Prerequisite: consent of instructor. (PSE)

3 units (Krumboltz, LaFromboise) not given 2000-01

239. Contemporary Social Issues in Child and Adolescent Development—Focuses on critical social and developmental issues that affect children and adolescents. Topics: divorce and single parenting, child care, poverty, sexuality, and mass media, emphasizing the impact of these conditions on normal development, education, and school-related social and cognitive performance. (PSE)

4 units, Spr (Padilla)

240. Adolescent Development and Learning—Two presuppositions: that fruitful instruction takes into account the developmental characteristics of learners and the task demands and structure of specific curricula; and that teachers can promote learning and motivation by mediating between the characteristics of students and of the curriculum and the wider social context of the classroom. The strategies and issues involved in this mediational process with secondary students. Prerequisite: STEP student or consent of instructor. (STEP)

3 units, Aut (Roeser, Padilla)

241. Race, Education, and the Media—(Same as 141.) In-depth overview of the critical issues and policies that impact race relations and education in our society. Lectures, readings, discussions on the debates on affirmative action, merit, racial inequality, improving educational quality, and how these issues are shaped by a rapidly changing media industry.

5 units (Carnoy, Steyer) not given 2000-01

243. Research in Writing and Writing Instruction—Tradition and change in writing research, emphasizing theoretical and pedagogical implications. Topics: formalist, cognitive, and social-contextual approaches; writing and learning; writing/reading connections; writing/speaking connections; the composing process; writing pedagogy; individual research projects. (SSEP, CTE)

4 units (Ball) not given 2000-01

244X. Classroom Management—Beginning and experienced teachers are concerned with how to best manage their classroom. Different strategies are placed within a theoretical framework. The approaches that could be employed when managing classrooms, and student behavior in particular.

1 unit, Aut, Win (Haysman)

245X. Seminar in Teacher Education—For doctoral students interested in preparing to become teacher educators or who have interests in policy issues related to teacher education. Directed reading, discussion, and analysis of teacher education program models; new approaches to support teacher learning in the pre-service and in-service contexts; and changes in policies relevant to teacher education. The theoretical frames include adult learning theory, organizational supports for professional learning, and issues of institutional change.

3 units (Darling-Hammond) not given 2000-01

246A,B,C,D. Secondary School Teaching Practicum—Preparation and practice in issues and strategies for teaching in classrooms with diverse students. Topics: instruction, curricular planning, classroom interaction processes, portfolio development, teacher professionalism, patterns of school organization, teaching contexts, and government educational policy. Classroom observation and student teaching with
accompanying seminars during each quarter of STEP year. 16 units required for completion of the program. Prerequisite: STEP student. (STEP)

246A. 2 units, Sum (Lotan)
246B. 1-4 units, Aut (Lotan)
246C. 7-10 units, Win (Lotan)
246D. 3 units, Spr (Lotan)

247. Moral Education—Issues in moral theory and education, including consideration of the Kohlberg-Gilligan debate, character education, and contemporary issues on values and religious education. (SSPEP)
3 units, Win (Damon)

249. Theory and Issues in the Study of Bilingualism—For graduate students. Key issues in the study of bilingualism from a sociolinguistic perspective. Emphasis is on typologies of bilingualism, the acquisition of bilingual ability, the description and measurement of bilingualism, and the nature of societal bilingualism. Prepares students to work with bilingual students and their families and to carry out research in bilingual settings. (SSPEP)
3 units, Win (Damon)

250A. Statistical Analysis in Educational Research—Primarily for doctoral students. Regression and categorical models are widely used data-analytic procedures. Topics: basic regression including multiple and curvilinear regression, regression diagnostics, analysis of residuals and model selection, logistic regression, analysis of categorical data. Proficiency with statistical computer packages. Prerequisite: 160 or equivalent. (All Areas)
4 units, Win (Loeb)

250B. Statistical Analysis in Educational Research: Analysis of Variance—Sequence, primarily for doctoral students. Analysis of variance models are among the most widely used data analytic procedures, especially in experimental, quasi-experimental, and criterion-group designs. Topics: single-factor ANOVA, the factorial between and within subjects and mixed design ANOVA (fixed, random, and mixed models), analysis of covariance, multiple comparison procedures. Prerequisite: 160X or equivalent. (All Areas)
4 units, Spr (Ruiz-Primo)

4 units, Aut (Ruiz-Primo)

252. Introduction to Test Theory—Concepts of reliability and validity; derivation and use of test scales and norms; mathematical models and procedures for test validation, scoring, and interpretation. Prerequisite: Statistics 190 or equivalent. (PSE)
3-4 units (Haertel) not given 2000-01

253X. The Principalship: Theory and Practice—For those interested in leadership roles in K-12 education, or for those interested in the theory and practice of school administration. Seminar immerses students in a broad study focused on conceptions of the role of the school principal.
4 units, Spr (Copland)

257A,B. Statistical Methods for Behavioral and Social Sciences—For students with experience and training in empirical research. Analysis of data from experimental studies through factorial designs, randomized blocks, repeated measures; regression methods through multiple regression, model building, analysis of covariance; categorical data analysis through log-linear models, logistic regression. Integrated with the use of statistical computing packages. Prerequisite: analysis of variance and regression at the level of Statistics 161.
257A. 3 units, Win (Rogosa)
257B. 3 units, Spr (Rogosa)

260X. Popular Advanced Statistical Methods—Overview and implementation of some advanced statistical methods currently popular in educational research. Methods for accommodating the nested structure of much educational data (e.g., students within classrooms within schools) which arise as units of analysis problems, ecological regression, or hierarchical linear models. Methods for complex measurement models in regression settings known as structural equation models, causal models, covariance structures. See http://www.stanford.edu/class/ed 260.
3 units (Rogosa) not given 2000-01

261X. Critical Reading in the Content Areas—Topics: introduction to models of reading, functions of literacy, components of reading instruction, content vs. recreational reading, literacy vs. expository materials, and reading to learn vs. learning to read; text types; testing and assessment; vocabulary and reading instruction; comprehension and background knowledge; study skills and aids; metacognition; strategies; writing and reading instruction; technological applications; affective concerns and motivations. (SSPEP)
3 units, Spr (Kamil)

262A,B,C. Curriculum and Instruction in English—Approaches to teaching English in the secondary school, including goals for instruction, teaching techniques, and methods of evaluation
262A. 3 units, Sum (Grossman)
262B. 2 units, Aut (Grossman, Vosovic)
262C. 2 units, Win (Grossman, Vosovic)

263A,B,C. Curriculum and Instruction in Mathematics—The purposes and programs of mathematics in the secondary curriculum; teaching materials, methods. Prerequisite: STEP student or consent of instructor. (STEP)
263A. 3 units, Sum (Boaler)
263B. 2 units, Aut (Boaler)
263C. 2 units, Win (Boaler)

264A,B,C. Curriculum and Instruction in Foreign Languages—Approaches to teaching foreign languages in the secondary school, including goals for instruction, teaching techniques, and methods of evaluation. Prerequisite: STEP student. (STEP)
264A. 3 unit, Sum (Azevedo)
264B. 2 unit, Aut (Azevedo)
264C. 2 units, Win (Azevedo)

265X. History of Higher Education in the U.S.—See 165X.
3-5 units, Win (Rothblatt)

267A,B,C. Curriculum and Instruction in Science—Examination of the possible objectives of secondary science teaching and related methods: selection and organization of content and instructional materials; lab and demonstration techniques; evaluation, tests; curricular changes; ties with other subject areas. Prerequisite: STEP student or consent of instructor. (STEP)
267A. 3 unit, Sum (Atkin)
267B. 2 unit, Aut (Schultz)
267C. 2 units, Win (Schultz)

268A,B,C. Curriculum and Instruction in Social Studies—Emphasis is on the methodology of social studies instruction: review of curriculum trends, survey of teaching materials, opportunities to develop teaching and resource units. Prerequisite: STEP student.
268A. 3 unit, Sum (Cuban)
269. Principles of Learning for Teaching—Student learning and the epistemology of school subjects as they relate to the planning and implementation of teaching, the analysis of curriculum, and the evaluation of performance and understanding. Readings and activities are coordinated with internship and the student teaching activities of participants. Prerequisite: STEP student or consent of instructor.

3 units, Win (Darling-Hammond, Greeno)

275. African-American English in Educational Context—The linguistic and cultural conflicts confronting the majority of African-American students. Interdisciplinary research, emphasizing cross-generation-al educational needs. Ethnographic studies of schools and their students, and the evolution of educational and linguistic research among African Americans. Prerequisite: graduate student, or consent of instructor. (SSPEP)

3 units (Baugh) not given 2000-01

277X. Education of Immigrant Students: Psychological Perspectives—For graduate students; see 177X.

4 units, Win (Padilla)

278. Introduction to Issues in Evaluation—Focus is on the basic literature and major theoretical and practical issues facing the evaluation field. Topics: evaluation as a branch of experimental science, models of evaluation, quantitative and qualitative approaches to evaluation, evaluation as related to decision-making and the political process, and professional standards of evaluation. (SSPEP)

3 units, Win (Porteous)

279. Urban Youth and their Institutions: Research and Practice—For graduate students; see 179X. Enrollment limited, consent of instructor required. (SSPEP/APA)

3-4 units, Aut (McLaughlin)

280. Ethnographic Approaches to Cultural Diversity in Schooling—(Same as Cultural and Social Anthropology 280.) How to learn about culture and to analyze education-relevant situations such as the culturally diverse classroom. The cultural process is approached by acquiring techniques of observation, interview, and interpretation of behavior in context, and soliciting and recording the "native" explanations of their own behavior; developing an internally consistent conceptual structure that orients observation and elicitation productively; and being sensitized to one's own culture and how it influences perception and interpretation of behavior. Techniques of ethnographic research applicable to the study of schooling are demonstrated and applied in field research projects. Research report or proposal for research. (SSPEP)

4 units, Win (Spindler)

282. Linguistics and the Teaching of English as a Second/Foreign Language—Enroll in Linguistics 189/289.) (SSPEP)

4-5 units, Win (Hubbard)

283. Attitudes toward Languages and Language Study—With language viewed as an intergroup phenomenon, examines attitudes people hold toward their own and different languages, the bias toward and against speakers of different languages, how personal and societal attitudes affect the study and learning of a foreign or second language. A socio-psychological perspective is used as a central framework to guide the study of attitudes toward language. (SSPEP)

3 units (Padilla) not given 2000-01

284. Teaching in Heterogeneous Classrooms—Teaching in academically and linguistically heterogeneous classrooms requires a repertoire of pedagogical strategies. Focus is on the ways to provide access to intellectually challenging curriculum and equal-status interaction for students in diverse classrooms. Emphasis is on groupwork, a highly recommended and documented instructional approach, and its cognitive, social, and linguistic benefits for students. How to prepare students for groupwork, equalize participation, design learning tasks that support conceptual understanding, mastery of content and language growth, and assess group products and individual contributions. (STEP)

3-4 units, Win (Gallagher-Thompson, Moffett)

286A. Second Language Acquisition—For students interested in teaching English as second/foreign language. Second language learning and teaching. Serves as basis of second language pedagogy, preparing STEP students for CLAD certification. (SSPEP, STEP)

4 units (Staff) not given 2000-01

286B. Second Language Acquisition Research—Major research findings and theories in second language acquisition. Second language research and theories in formal and informal settings where a second language is learned. (SSPEP)

4 units (Padilla) not given 2000-01

287. Culture and Learning—(Same as Cultural and Social Anthropology 158.) Learning in various institutional settings in the U.S. and around the globe. Learning in families, in schools, on the job, and on the streets. Emphasis is on the cultural organization of success and failure in American schools. Tentative consideration of opportunities for making less inequality. (SSPEP, STEP)

3-4 units, Win (McDermott)

289. Introduction to Linguistics for Educational Researchers—For graduate students with interests in educational research, and who plan to concentrate on language or linguistics. Basic linguistic concepts, complementary surveys of educationally oriented studies that explore quantitative linguistic analyses, qualitative ethno-linguistic analyses, discourse analyses, conversation analyses, and studies of bilingualism. Emphasis is on the linguistic analyses of language minority populations and related educational policies.

4 units, Aut (Baugh)

290. Leadership: Research, Policy, and Practice—Conceptions of leadership that include the classroom, school, district office, and state capitol. The role of complexity; organizational leaders outside of schools past and present, and how that complexity permitted leadership to arise. Case studies. (SSPEP/APA)

3-4 units (Cuban) not given 2000-01

295. Learning and Cognition in Activity—(Same as Psychology 261.) Introduction to the results and methods of research on learning, understanding, reasoning, problem solving, and remembering, considered as aspects of participation in social organized activity. Analyses focus is on the principles of coordination that support cognitive achievements and learning in activity settings in work and school environments.

3 units, Spr (Greeno)

296. Substance Dependence: Assessment, Treatment, and Prevention—Offered at the Menlo Park division of the VA Palo Alto Health Care System; open to graduate students in the social sciences. Survey of prevalence, etiology, and treatment of alcohol and drug-related disorders. Focus is on a developmental perspective and how substance abuse disorders manifest themselves in men and women at different ages from childhood through late adulthood. Various treatment approaches that have been beneficial, e.g., AA, individual and group work, family treatment, and inpatient vs. outpatient care. Required visit to relevant treatment programs during the quarter. (PSE)

3 units, Win (Gallagher-Thompson, Moffett)

tion and critique of research methods including classroom observation, interaction analysis, classroom ethnography, interviews and questionnaires, elicitation techniques, and case studies. Individual projects utilize data gathered in second language classrooms. (SSPEP)

3 units (Valdés) not given 2000-01

301. Historiography of American Education—(Same as History 301.) Analysis of the literature of American education history for students doing further work in the field. Weekly colloquium discussions, plus an opportunity to pursue specialized topics in small group tutorial sessions. Limited enrollment. Prerequisite: consent of instructor. (SSPEP)

3-4 units (Williamson) given 2001-02

302X. The Role of Knowledge and Learning in Teaching—Focus is on current literature relevant to the subject of teaching. Classroom life, and to the cognitive processes involved as students try to learn material. The implications of the literature on the role of the teacher. (CTE)

3 units (Staff) not given 2000-01

303. Qualitative Inquiry in Education—The ways in which artistically and humanistically based approaches to the study of teaching, classroom life, and schooling can improve the understanding of education. Introduces qualitative methods of inquiry that emphasize literary and other interpretive forms, and new approaches to inquiry in education. A study using methods. (CTE)

4 units, Sum (Eisner)

304. The Philosophical and Educational Thought of John Dewey—Analysis of important works of John Dewey. Readings vary each year. Emphasis may be on his social and moral writings. (SSPEP)

4 units, Aut (Staff)


5 units, Win (Carnoy)

306B. The Politics of International Cooperation in Education—(Same as 107.) Analysis of policies and practices in international cooperation, assistance, and exchange. Emphasis is on the role of international organizations (World Bank, UNESCO, OECD) and the politics of multilateral and bilateral assistance programs. (SSPEP/ICE, APA)

3-4 units, Spr (Mundy)

306C. Culture and Technology—(Same as Cultural and Social Anthropology 285.) Technologies and the ways of learning in specific cultural and social environments. Anthropological perspectives on the rise of information technologies and their relation to 20th-century systems of measurement, modes of thought, and forms of hegemony. Topics: accounting systems, metal, paper, plastic, and electronic currencies, writing systems and literacy, and computerized learning environments. (SSPEP/ICE)

4 units, Spr (McDermott)

306D. World, Societal, and Educational Change: Comparative Perspectives—(Same as Sociology 231.) Analysis of the relations between educational and societal developments from a comparative perspective. Readings on various theoretical perspectives and empirical studies on the structural and cultural sources of educational expansion and differentiation, and on the cultural and structural consequences of educational institutionalization. Research topics: education and nation-building; education, mobility, and equality; education, international organizations, and world culture. (SSPEP/ICE)

4-5 units, Aut (Ramirez)

308. The Analysis of Teaching—Teaching is often considered an art or craft rather than a science. Is this true? Do teachers function as performers? Videotapes of teachers in action serve as a resource for the analysis of teaching. Concepts and methods from the field of criticism provide tools to analyze teaching. Literature in criticism, aesthetics, and qualitative evaluation secures the conceptual tools for the analysis of teaching. (CTE)

4 units (Eisner) not given 2000-01

310. Problems in Sociology of Education—For doctoral and master's students. Meets with 210. Emphasis is on conceptualizing and analyzing applied sociological research in education. Short written assignments, individual feedback, and work with actual research data. (SSPEP)

4 units, Spr (McFarland)

311X. First-Year Doctoral Seminar: Introduction to Research—Introduction to the broad range of methods used in current educational research, focusing on the logical and epistemological, design, and ethical issues. (All Areas)

1-2 units, Aut (Phillips)

Spr (Phillips, Stipek)

312. Interaction Processes in Education—The educational applications of sociological/social psychological theory and research to interaction processes within schools and classrooms. Readings in foundational works by Mead, Schutz, Simmel, and more contemporary works in sociology and education, spanning a variety of empirical settings beyond classrooms, e.g., primate societies, children's games, and work settings. Topics: social processes of influence, role differentiation, identity formation, social mechanisms, and intra/inter-group dynamics of peer relations. Methods for observation and analysis. (SSPEP)

4 units, Aut (McFarland)

313X. Mathematics, Equity, and Situated Learning—The ways in which mathematics intersects with people's lives, the reasons why it is practiced only by the elite few and the potential of situated perspectives for the attainment of equitable practices. Drawing on theories of learning, curriculum, equity, and schooling, students research these and related issues.

3 units (Boaler) not given 2000-01

314. Workshop in Economics of Education—Research by students and faculty engaged in problems in the economics of education. Students must have advanced graduate training in economics theory and methodology and be engaged in research on the topic. (SSPEP)

1-2 units, Aut, Win, Spr (Carnoy)

315X. Vouchers and Choice in Education—The theory and empirical data on issues of educational choice and vouchers in the U.S., Europe, and other countries. Recommended: background in economics. (SSPEP)

3 units (Carnoy) not given 2000-01

316X. Network Methods for the Study of Formal and Informal Organizations—The educational applications of social network analysis. Introduction to social network theory, methods, and research applications in sociology. Network concepts of interactionist (e.g., balance, cohesion, centrality) and structuralist (e.g., structural equivalence, roles, duality) traditions are defined and applied to topics in small groups, social movements, organizations, communities, etc. Students apply these techniques to data on schools and classrooms (i.e., data provided by instructor). (SSPEP)

3 units, Win (McFarland)

321B. Analysis of Social Interaction—Practicum on discourse, interactional, and cultural analysis of videotaped data. Various levels of analysis of interactional data, and the basis on which analytic claims can be founded. The transcription of speech and movement in social interaction, and how to identify the patterns which participants use to display and interpret cultural meanings. The theoretical assumptions hidden in
transcription systems. Prerequisite: first- or second-year graduate student. (SSPEP/ICE)
4 units, Aut (McDermott)

322X. Discourse Analysis in Educational Research—Issues and strategies for studying oral and written discourse as a means for understanding classrooms, students, and teachers, and teaching and learning in the context of school. The forms and functions of oral and written language in the classroom, emphasizing teacher-student and peer interaction, and student-produced texts. Individual projects utilize discourse analytic techniques. Prerequisite: graduate status or consent of instructor. (SSPEP)
3 units (Ball) not given 2000-01

3 units, Aut (Kirst)

324X. Emerging Business Opportunities in Education and Training—(Same as Business 345G.) For students in the joint degree program with business and education, and others. A combination of changing market mechanisms and emerging technologies is fueling new opportunities for for-profit education and training organizations. The interaction of firms with the public sector presents special challenges for these organizations. The special roles of public administrators, educators, investors, and technology providers in defining opportunities, challenges, and constraints for education and training firms. Approaches to strategy formation, product development, and operations. Visiting managers and other experts. (SSPEP/APA)
2-4 units, Spr (Kirst)

327A, B, C. The Conduct of Qualitative Inquiry—Integrated, three quarters for doctoral students ready to engage in serious pursuit of research that anticipates, is a pilot study for, or in some significant way feeds into their dissertations. It is not necessary that students have written and received approval for their dissertation study. The experience mirrors most of what any research project entails, and is about the actual conduct of research. All students engage in common research processes from September to June including developing interview questions; interviewing; coding/analyzing, interpreting data; theorizing; and writing up results. Participant-observation as needed. Students should consider this a sequence, with the division into quarters as arbitrary. Preference to students who intend to enroll for all three quarters.
327A. 4 units, Aut (Peshkin)
327B. 4 units, Win (Peshkin)
327C. 4 units, Spr (Peshkin)

331A, B. Administration and Policy Analysis Research Seminar—Limited to first-year APA doctoral students. Introduces the rudiments of problem statements, conceptual frameworks, research design, and critical reviews of literature. (SSPEP/APA)
331A. 3 units, Win (Copland, Antonio)
331B. 3 units, Spr (Copland, Antonio)

333A. Advanced Seminar in Learning Design and Technology: Analyzing Functions and Needs in Learning Environments—Introduction to the theoretical approaches to learning used to analyze learning environments and develop goals for designing resources and activities to support more effective learning practices.
3 units, Sum (Greene)

333B. Advanced Seminar in Learning Design and Technology: Organizations—How organizational resources, structures, constraints, and possibilities are taken into account in research-based designs for learning in schools and workplaces. Presentations and discussions by researchers from the Institute for Research on Learning offer an overview of current research and development efforts for improving learning in schools and workplaces.
3 units, Win (Goldman)

333C. Advanced Seminar in Learning Design and Technology: Social and Ethical Issues—Readings/discussions, case studies, and internships on the ethical and social issues related to learning and technology. Prerequisite: enrollment in LDT, or consent of instructor.
3 units (Kamil) not given 2000-01

335X. Language Policy and Planning: National and International Perspectives—For graduate students and undergraduates, with consent of instructor. International study of the social, political, and educational tensions that shape language policy. Emphasis is on language education that affects immigrants, guest workers, and indigenous linguistic minority populations; policies that determine foreign language instruction, and U.S. language policies in a comparative approach. (SSPEP)
3 units, Spr (Valdés)

338A, B, C. Practicum in Counseling and Health Psychology—For Counseling Psychology majors only. Intensive supervised field experience in local schools or social agencies. (PSE)
338A. 1-6 units, Aut (LaFromboise, Krumbolz)
338B. 1-6 units, Win (LaFromboise, Krumbolz)
338C. 1-6 units, Spr (LaFromboise, Krumbolz)

340X. American Indian Mental Health and Education—Western medicine tends to define health by first defining sickness, disease, or pathology, and then defining health as the absence of these diseases. Native American cultures understood health to mean the balance or beauty of all things physical, spiritual, emotional, and social. Sickness was something out of balance, the absence of harmony. Representative topics in American Indian psychology and health acquaint students with issues that characterize the field, its methods, goals, and findings. Prerequisite: experience working with American Indian communities. (PSE)
3 units, Spr (LaFromboise)

341. Educational Applications of Sociolinguistics—For students interested in the broad applications of linguistic research in educational contexts. Formal integration of sociolinguistics and applied linguistic research is examined in relation to a range of international case studies among students and teachers in socially stratified speech communities worldwide. Theoretical concepts from linguistics are introduced as they relate to practical educational problems in socially stratified speech communities. Recommended: background in linguistic science for students who seek an introduction to applied linguistic research. (SSPEP)
3 units, Win (Baugh)

343X. Achievement Motivation in School-Aged Children—Surveys developments in the study of achievement motivation in children and adolescents over the past 50 years. The historical and theoretical approaches to understanding the quality, intensity, and direction of children’s achievement-related behavior. Clinical life-span theories, cognitive theories, and social-cognitive theories of achievement motivation. Differences among mechanistic, organismic, and developmental-contextual metamodels of motivation, qualitative vs. quantitative conceptualizations of “motivation,” and the differential emphasis placed upon organismic needs, cognition, volition, and emotion in theories concerned with understanding achievement behavior. (PSE)
3 units (Roeser) not given 2000-01

344X. Child Development and Schooling—School represents a major context of development during childhood in the U.S. How the practices and activities of schooling influence the social, emotional, and cognitive development of children. Meta-theoretical approaches (e.g., mechanistic, organismic, developmental contextualist metamodels) and methods of conducting research on schooling and development (experimental,
345X. Adolescent Development and Schooling—School represents a major context of development during adolescence in the U.S. How the context of school and its relationship to other major context developments (family, peer group, and neighborhood) influence the social, emotional, and cognitive development of secondary school-aged youths. Metatheoretical approaches (e.g., mechanistic, organicism, developmental contextualist metamodels) and methods of conducting research on schooling and development (laboratory, survey, ethnographic, intervention, etc.). Topics: school transitions during adolescence, the role of school functioning in broader patterns of competence or distress, and how the organization of academic tasks, classrooms, and school environments as a whole can influence different aspects of adolescent development. Focuses on the middle and high school years (see also 344X). (PSE)

3 units, Win (Roese)

347X. Economics of Higher Education—Key economic issues in American higher education in the contemporary period. Topics: the "worth" of college and graduate degrees and the utilization of highly educated graduates; faculty labor markets, careers, and workload; costs and pricing; discounting, merit aid and access to higher education; sponsored research, academic medical centers; and technology and productivity. Emphasis is on theoretical frameworks and policy matters, exploring the concept of higher education as a public good. Stratification by gender, race and social class.

4 units, Aut (Antonio)

350A. Psychological Studies in Education—Required of first-year doctoral students in Psychological Studies; others by consent of instructor. Introduction to the doctoral program in Psychological Studies in Education and to faculty and student research. (PSE)

1 unit, Aut (Barron, Padilla)

350B.C.D. Research Practicum in Psychological Studies in Education—Three-quarter sequence provides students in PSE an opportunity to engage in all facets of the research process. Individual projects in a group context provide extensive opportunities for training and feedback concerning specific projects and the general enterprise of psychological research in education. 350B and C are required of first-year students in PSE; 350D is required of second-year students in PSE. Others by consent of instructor. (PSE)

350B. 3 units, Win (Greeno, Krumboltz)
350C. 3 units, Spr (Rogosa, Roese)
350D. 1 unit, Aut, Win, Spr (Hakuta, Roese)

351. Design and Analysis of Longitudinal Research—The analysis of longitudinal data is central to empirical research on learning and development. Topics: growth models, measurement of change, repeated measures design, quasi-experiments, structural regression models, reciprocal effects, analysis of durations including survival analysis. See http://www.stanford.edu/class/ed351/. Prerequisite: statistical training at the level of 257. (PSE)

3 units (Rogosa) not given 2000-01

353A. Problems in Measurement: Item Response Theory—Survey of the alternative mathematical models used in test construction, analysis, and equating. Emphasis is on applications of item response theory (latent trait theory) to measurement problems, including estimation of item parameters and person abilities, test construction and scoring, tailored testing, mastery testing, and detection of item bias. Prerequisites: 252 and 257, or Psychology 248 and 252, or equivalent. (PSE)

3 units (Haertel) not given 2000-01

353C. Problems in Measurement: Generalizability Theory—Theory and application of generalizability theory to the analysis of educational achievement data, including performance assessments. Fundamental concepts, computer programs, and actual applications. (PSE)

3 units (Haertel) not given 2000-01

353D. Problems in Measurement: Standard Setting—Cut scores on achievement tests define categories like "pass" and "fail" or "advanced," "proficient," "basic," and "below basic." The measurement field is divided concerning the validity of some methods used for establishing such cut scores. The substantive and statistical issues in the theory and practice of standard setting: widely used methods, case studies, and critiques. Prerequisites: 160 or Statistics 160, or equivalent; 252 or equivalent.

3 units (Haertel) not given 2000-01

356X. Action Research in Education—Introduction to the theory and practice of action research. Basic concepts and methods. The historical and ideological influences on this form of inquiry by teachers. Participants analyze action research reports and engage in a small-scale action-research project. (CTE)

3 units (Atkin) not given 2000-01

361. The Economics of Gender in Education and Employment—Policy issues concerning higher education, employment, earnings, discrimination, occupational segregation, housework, childcare, affirmative action, comparable worth, and feminist economics. (SSPEP)

3 units (Strober) not given 2000-01

364X. Reading in a Second Language—Examination of the theories and research related to learning to read in a second language in child and adult learning contexts. The similarities and differences between first- and second-language theories and research on learning to read. Applications of research findings to pedagogy. (SSPEP)

3 units (Kamil) not given 2000-01
366X. Trends and Issues in Reading—Current trends and issues in literacy and literacy instruction, providing a framework for work in reading and literacy. Research, theory, and implications for practice in classroom organization, compensatory instruction, comprehension instruction, reading and writing assessment, second language reading, whole language emergent literacy, adult literacy, and technology. (SSPEP)
3 units, Win (Kamil)

367X. Reading Research Syntheses, Policy, and Practice—Examines the national syntheses of reading research beginning with "The Great Debate" (1967) and concluding with the National Reading Panel (2000). These reports are often the basis of recommendations for parents, administrators, and teachers, and have been the foundation of policy for curricular reform. Students engage in a critical examination of these reports, interpretations, and commentaries, comparing the conclusions and recommendations with those derived from the original research upon which they were based.
3 units (Kamil) not given 2000-01

372. Social Processes in Learning and Development—Doctoral seminar on how children's learning and development are influenced by social interactions with parents, peers, teachers, and the larger cultural context. Emphasis is on research that illuminates the social/cognitive processes thought to influence the development of individual thinking: observation and imitation of models, co-construction of meaning and achievement of intersubjectivity, providing and receiving explanations, and socio-cognitive conflict. How the larger social culture influences the behavior of individuals in interaction and how forms of school culture influence children's individual thinking and thinking in collaboration with others.
(PSE)
3 units, Win (Powell)

374A,B. Research Workshop: Commercialization of Knowledge—Research workshop on key factors that shape processes of transferring basic knowledge into commercial development. Topics: the sociology and economics of science, intellectual property and patenting issues, university-industry relations, cross-national differences in knowledge transfer and science/technology policy, and entrepreneurial activity in universities. Students are expected to either have or to develop research projects on these topics.
2-3 units, Aut, Win (Powell)

375A. Seminar on Organization Theory—(Same as Sociology 363A.) For doctoral-level students or equivalent, providing a thorough grounding in the social science literature on organizations. Readings are organized historically, and introduce the major theoretical traditions and debates in organization theory.
5 units, Aut (Powell)

375B. Seminar on Organizations: Theory and Application—(Same as Sociology 363B.) Continuation of Sociology 363A. The current research on organizational change, drawing on institutional, network, and evolutionary perspectives. Focus is on recent empirical studies that analyze organizational/institutional/political change.
5 units, Win (Powell)

376. Education and Theories of the State—Examines the relationship between political system structures and educational change by analyzing theories and interpretations of how political systems function, and the implications of these theories for understanding education. Classical and Marxist interpretations. (SSPEP/ICE)
5 units (Carnoy) not given 2000-01

377X. Comparing Institutional Forms—Public, Private, and Nonprofit—Assesses whether there is growing convergence across sectors. Focus is on education, health care, day care, the arts, social service, and research. (SSPEP)
4 units (Powell) not given 2000-01

378X. Topics in Organizational Adaptation—Research seminar focusing on theoretical ideas about decision making and learning in organizations. (SSPEP)
2-5 units (March) not given 2000-01

380. Supervised Internship
1-15 units, any quarter (Staff)

381. Multicultural Issues in Higher Education—Reviews the primary social, educational, and political issues that have surfaced in American higher education due to the rapid demographic changes occurring since the early 1980s. Research efforts and the policy debates include multicultural communities, the campus racial climate, and student development; affirmative action in college admissions; multiculturalism and the curriculum; and multiculturalism and scholarship.
4 units (Antonio) not given 2000-01

382X. Student Development and the Study of College Impact—Introduces the philosophies, theories, and methods that undergird the bulk of the research in higher education: how college affects students. Student development theories and models of college impact; issues surrounding data collection, national databases, and secondary data analysis.
4 units, Win (Antonio)

383X. Higher Education Research Practicum—Required of first-year doctoral students in higher education. Seminar. Students obtain familiarity with a range of research specializations in the study of higher education.
2 units (Antonio) not given 2000-01

384. Advanced Topics in Higher Education—Preference given to higher education graduate students. In-depth analysis of selected topics in the study of higher education. Topics vary each year among faculty: development, legal issues, curricular change, knowledge production, professional socialization, management of organizational decline, leadership and innovation, authority and power, diversity and equity, interactions with government and industry. Prerequisites: 346, consent of instructor. (SSPEP/APA)
4 units (Gumport) not given 2000-01

385. The American College Student: Implications for Research and Practice—Open to juniors and seniors with consent of instructor. The nature, culture, and development of the American college student. The American college student from a contemporary perspective, focusing on the question of: who goes to college, what kinds of experiences do students have in college, and how are students affected by their experiences in college?
4 units (White) not given 2000-01

386X. Leadership and Administration in Higher Education—For students who wish to gain a greater insight regarding the management of colleges and universities, and the issues faced by those who hold major leadership roles within these institutions. Definitions of leadership and leadership roles within colleges and universities. Leadership models and organizational concepts useful in understanding institutions of higher education through case study analysis of the problems and challenges facing today's higher education administrators.
4 units, Win (White)

387A,B,C. Workshop: Comparative Studies of Educational and Political Systems—(Same as Sociology 311A,B,C.) Analysis of quantitative and longitudinal data on national educational systems and political structures. Prerequisite: consent of instructor. (SSPEP/ICE)
387A. 2-5 units, Aut (Ramirez)
387B. 2-5 units, Win (Meyer)
387C. 2-5 units, Spr (Meyer)
388A,B. Bilingual Education—Research issues of policy and practice, particularly in the U.S., in programs for language minority students. Topics: the history of policy and legislation in bilingual education, theories of second language learning and first language maintenance, research on the effectiveness of bilingual education, and comparative experiences in other societal settings. (SSPEP, STEP)

388A.—Prepares STEP students for CLAD certification.
3.4 units, Spr (Hakuta)

388B.—For SSPEP students.
3 units, Win (Hakuta)

400X. Writing Seminar for Doctoral Students—For doctoral students to improve scholarly writing; an experience in the process of revision. Topics: the power of lead sentences, strong verbs, telling titles, organization, proper conclusions, and as needed, the quotidian matters of spelling, grammar, and hyphenation. Students submit a fully revised version of their paper as a final product.
2 units (Peshkin) not given 2000-01

401. Mini Courses in Methodology—For doctoral students. Particular issues during designated quarters. Enrollment limited. Prerequisite: consent of instructor.
1-2 units (Staff) not given 2000-01

405. Education and Political Change—Introductory analysis of the relations between education and social and political change from a comparative perspective. Topics: different theoretical approaches to the study of education and politics, questions of legitimacy in educational policy, international factors in educational development, the politics of educational planning and reform, processes and conditions of political learning, and the politics of curriculum and pedagogy. (SSPEP/ICE)
4-5 units (Mundy) not given 2000-01

408. Research Workshop in International and Comparative Education—Limited to advanced doctoral students in ICE and SSPEP. Research workshop for the review of key issues in the methodology and epistemology of social research in education, research proposals, and findings by students and faculty. Prerequisites: 306A,B,C,D or equivalents. (SSPEP/ICE)
2-5 units, Win (Carnoy)

410. Topics in Symbolic Systems in Education—For students in all areas. Topics in the interdisciplinary study of intelligence, information, meaning, and learning, emphasizing research relevant to educational practice. Research perspectives from anthropology, artificial intelligence, linguistics, philosophy, and psychology. (PSE)
1 unit, Aut, Win, Spr (Greeno)

412X. Setting Priorities, Standards and Policies in Education Research—Review of current research and classic papers on the psycholinguistics and sociolinguistics of bilingualism. (PSE)
3 units (Hakuta) not given 2000-01

416. Seminar on Aptitude—Limited to doctoral students in education and psychology. The study of individual differences in learning, cognitive, connotative, and affective processes related to education. The design and evaluation of instruction with respect to individual differences. Prerequisites: 255 or equivalent, and consent of instructor. (PSE)
3 units (Staff) not given 2000-01

418. Foundations of Field Research in Higher Education—For higher education/APA graduate students, and appropriate for doctoral students working on qualifying papers or dissertations. Advanced seminar examines the rationales for doing interpretive social science research in higher education settings. Students acquire methodological training in fieldwork through hands-on opportunities to collect, analyze, and critique case study data obtained from interviews, observation, and document analysis. Prerequisites: 346, consent of instructor. (SSPEP/APA)
3-5 units (Christopher) not given 2000-01

420A,B,C. Advanced Seminar in Philosophy of Education—Particular issues during designated quarters. Enrollment limited; sign up with instructor prior to beginning of quarter. (SSPEP)
420A. 3 units, Aut (Callan)
420B. 1-3 units (Phillips) not given 2000-01
420C. 1-3 units (Callan) not given 2000-01

422A,B,C. Practicum for School Principals—The major tasks and related activities of principals. Uses a training approach that is problem rather than discipline based and provides for a substantial degree of self-directed learning by students under the guidance of professors and practicing principals. (SSPEP/APA)
6 units, Sum (Copland)

423A. Introduction to Research Design: Educational Administration and Policy Analysis—Preference to APA doctoral students working on their sixth-quarter qualifying paper. Focus is on the key issues in conceptualizing and designing research in the social sciences. (SSPEP/ APA)
3-5 units, Win (Gumport, Smith)

425X. Advanced Seminar: Federal Educational Policy—Limited to doctoral students. Focus is on policy trends, dilemmas, and issues in Federal education policy over the past 40 years. Issues of federal purpose and role, centralization and decentralization, equality and quality, civil rights, evaluation and research, and the implementation of federal programs. Early childhood, K-12 and post-secondary education. Requires a significant and potentially publishable analysis of a federal policy or practice. (SSPEP/APA)
3 units, Win (Smith)

430A. Advanced Seminar in Childhood and Adolescent Development—Limited to advanced doctoral students in PSE and others with a strong background in developmental psychology, and offered in conjunction with the doctoral training seminar at the Center on Adolescence. In-depth readings/discussions about the developmental processes that account for adaptation (or non-adaptation) in interpersonal models of social and personality development. Selected research on topics that are drawing attention in the field at the present time. Emphasis is on contemporary frameworks for understanding social and personality development. Prerequisite: consent of instructor.
3 units, Aut (Damon)

431. Doctoral Seminar: Counseling and Health Psychology—Analysis of professional problems. May be repeated for credit. Prerequisites: doctoral candidates in counseling psychology, consent of instructor. (PSE)
1-3 units, Aut, Win, Spr (LaFromboise, Krumboltz)

435X. Research Seminar in Applied Linguistics—For graduate students in the schools of Education, and Humanities and Sciences, who are engaged in research pertaining to various applied linguistic topics in original research. Topics: language policies and planning, language and gender, writing and critical thinking, foreign language education, and social applications of linguistic science. (SSPEP)
1-4 units, Spr (Baugh)

444X. Research in Progress: Curriculum and Teacher Education— Required of first- and second-year doctoral students in CTE. Introduction to current research in the Curriculum and Teacher Education area. Weekly presentations of research planned, under way, or ready to be reported on some aspect of curriculum and teacher education by SUSE faculty, SUSE masters' or doctoral candidates, and faculty from else-
where in the University or Bay Area. Questions and discussion of conceptual and methodological issues. (CTE)

1 unit, Aut (Atkin)
Win (Peshkin)
Spr (Ball)

460. Advanced Seminar in Evaluation Design—Three quarters; for A.M. Policy Analysis and Evaluation students in the evaluation track. Discussion about evaluation issues, including the significance of multidisciplinary teamwork, design issues, negotiation, interpersonal skills, and ethics. (SSPEP/APA)

1 unit, Aut, Spr (Fetterman)

62. Doctoral Dissertation—For doctoral students only. (All Areas)

7-75 units, any quarter (Staff)

461X. Schooling and Mental Health Issues—Between 12-30% of all school-aged children experience moderate to severe emotional/behavioral difficulties. Many never receive services either within or outside of school to redress these difficulties, and untreated emotional/behavioral problems often undermine the affected children’s ability to learn, and their teachers’ ability to effectively teach. The theoretical/empirical, practical, and methodologic goals.

4 units (Roeser) not given 2000-01

466. Doctoral Seminar in Curriculum—Required of all doctoral students in CTE. The research and scholarship related to the CTE program at Stanford, acquainting students with the field, student research activities, and the kinds of problems they believe important in the field. All CTE faculty, other Stanford faculty, and outside speakers participate. Major problems in the field and the ways these are addressed by current investigators. (CTE)

2-4 units, Win (Atkin, Walker)

470. Practicum—For advanced graduate students. (All Areas)

1-15 units, any quarter (Staff)

470E. Practicum in Evaluation—Students participate in or conduct an evaluation. Topics of current interest in the area of educational evaluation. Prerequisite: student member of the Evaluation Consortium.

1-15 units, any quarter (Staff)

480. Directed Reading—For advanced graduate students. (All Areas)

1-15 units, any quarter (Staff)

490. Directed Research—For advanced graduate students. (All Areas)

1-15 units, any quarter (Staff)

493A. Seminar on Methodological Problems in Educational Research—Discussion of topics of current methodological interest. Practicum in consulting on actual projects being carried out by faculty and students.

1-3 units (Olkin) not given 2000-01

493B. Statistical Methods for Meta-Analysis—(Same as Health Research and Policy 206, Statistics 211.) Meta-analysis is a quantitative method for combining the results of independent studies, and enables researchers to synthesize the results of related studies so that the combined weight of evidence can be considered and applied. Examples from the medical, behavioral, and social sciences. Topics: literature search, publication and selection bias, statistical methods (contingency tables, cumulative methods, sensitivity analyses, non-parametric methods). Project. Prerequisite: basic sequence in statistics. (All Areas)

3 units, not given 2000-01
School of Engineering

Dean: James D. Plummer
Senior Associate Deans: John C. Bravman (Student Affairs), Anthony J. DiPaolo (SCPD), Anne R. Hannigan (Administration), Jeffrey R. Koseff (Faculty Affairs), Laura L. Breyfogle (External Relations)
Associate Dean: Noé P. Lozano (Diversity Programs)
Assistant Deans: Susan Clement (Graduate Student Affairs), Rene Cortinaz (Human Resources), Erica O’Neal (Diversity Programs)

Faculty Teaching General Engineering Courses

Associate Professors: Per K. Enge, David L. Freyberg, Kosuke Ishii, Bruce B. Lusignan, Mark G. Mungal, Stephen M. Rock
Assistant Professors: Christopher F. Edwards, Claire J. Tomlin
Professor (Research): Butrus T. Khuri-Yakub, Paul A. Durbin
Professors (Teaching): Gilbert M. Masters, Robert E. McGinn, Eric S. Roberts
Associate Professor (Teaching): Thomas H. Byers
Senior Lecturer: David Louge
Lecturers: Gerald Cain, Thomas Chou, Patrick Young, Julie Zelenski
Consulting Professors: Anoop Gupta, Richard Reis

The School of Engineering offers undergraduate programs leading to the degree of Bachelor of Science (B.S.), programs leading to both B.S. and Master of Science (M.S.) degrees, other programs leading to a B.S. with a Bachelor of Arts (A.B.) in a field of the humanities or social sciences, dual-degree programs with certain other colleges, and graduate curricula leading to the degrees of M.S., Engineer, and Ph.D.

The school has eight academic departments: Aeronautics and Astronautics, Chemical Engineering, Civil and Environmental Engineering, Computer Science, Electrical Engineering, Management Science and Engineering, Material Science and Engineering, and Mechanical Engineering. These departments and one interdisciplinary program, Scientific Computing and Computational Mathematics, are responsible for graduate curricula, research activities, and the departmental components of the undergraduate curricula. In research, where faculty interest and competence embraces both engineering and the supporting sciences, there are numerous programs within the school as well as several interschool activities, including the Alliance for Innovative Manufacturing at Stanford, Center for Integrated Systems, Center for Materials Research, Center on Polymer Interfaces and Macromolecular Assemblies, Center for Space Science and Astrophysics, Joint Institute for Aeronautics, Microwave Laboratory, the NIH Biotechnology Graduate Training Grant in Chemical Engineering, a program in Product Design, and the Radio Astronomy Institute. Petroleum Engineering is offered through the School of Earth Sciences.

Instruction in engineering is offered primarily during the Autumn, Winter, and Spring quarters of the regular academic year. During the Summer Quarter, a small number of undergraduate and graduate courses are offered.

UNDERGRADUATE PROGRAMS

The principal goals of the undergraduate engineering curriculum are to provide opportunities for intellectual growth in the context of an engineering discipline, for the attainment of professional competence, and for the development of a sense of the social context of technology. The curriculum is sufficiently flexible that a number of decisions on individual courses are left to the student and the adviser. For a student with well-defined educational goals, there is often a great deal of latitude.

In addition to the special requirements for engineering majors described below, all undergraduate engineering students are subject to the University general education, writing, and foreign language requirements outlined in the first pages of this bulletin. Depending on the program chosen, students have the equivalent of from one to three quarters of free electives to bring the total number of units to 180.

The School of Engineering's Handbook for Undergraduate Engineering Programs is available online at http://ugsb.stanford.edu and provides detailed descriptions of all undergraduate programs in the school, as well as additional information about extracurricular programs and services. A hard copy version is also available from the Office of Student Affairs in Terman Engineering Center, room 201. Because it is published in the summer, and updates are made to the website on a continuing basis, the handbook reflects the most up-to-date information for the academic year and is the definitive reference for all undergraduate engineering programs.

Accreditation—The Accreditation Board for Engineering and Technology (ABET) accredits college engineering programs nationwide using criteria and standards developed and accepted by U.S. engineering communities. At Stanford, the following undergraduate programs are accredited: Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. In ABET-accredited programs, students must meet specific requirements for engineering science, engineering design, mathematics, and science coursework. Students are urged to consult the School of Engineering Undergraduate Handbook and their adviser.

Accreditation is important in many areas of the engineering profession; students wishing more information about accreditation should consult their department office or the office of the Senior Associate Dean for Student Affairs in Terman 201.

Policy on Satisfactory/No Credit Grading and Minimum Grade Point Average—All courses taken to satisfy major requirements (including the requirements for mathematics, science, engineering fundamentals, Technology in Society, and engineering depth) for all engineering students (including both department and School of Engineering majors) must be taken for a letter grade if the instructor offers that option. For departmental majors, the minimum GPA (grade point average) for all courses taken in fulfillment of the Engineering Fundamentals requirement and the Engineering Depth requirement is 2.0. For School of Engineering majors, the minimum GPA on all engineering courses taken in fulfillment of the major requirements is 2.0.

ADMISSION

Students admitted to the University may declare a major in the School of Engineering if they elect to do so; no additional courses or examinations are required for admission to the school.

RECOMMENDED PREPARATION

FRESHMEN

Students who plan to enter Stanford as freshmen and intend to major in engineering should take the highest level of mathematics offered in high school. (See the "Mathematics" section of this bulletin for information on advanced placement in mathematics.) High school courses in physics and chemistry are strongly recommended, but not required. Additional elective course work in the humanities and social sciences is also recommended.

TRANSFER STUDENTS

Students who do the early part of their college work elsewhere and then transfer to Stanford to complete their engineering programs should follow an engineering or pre-engineering program at the first school, selecting insofar as possible courses applicable to the requirements of the School of Engineering, that is, courses comparable to those described below under "Undergraduate Programs." In addition, students should work toward completing the equivalent of Stanford's foreign language requirement and as many of the University's General Education Requirements (GERs) as possible before transferring. Some transfer students may require more than four years (in total) to obtain the B.S. degree. However, Stanford affords great flexibility in planning and scheduling individual programs which makes it possible for transfer students, who have wide
variations in preparation, to plan full programs for each quarter and to progress toward graduation without undue delay.

Transfer credit is given for courses taken elsewhere whenever the courses are equivalent or substantially similar to Stanford courses in scope and rigor. The policy of the School of Engineering is to study each transfer student’s preparation and make a reasonable evaluation of the courses taken prior to transfer. Inquiries may be addressed to the Senior Associate Dean for Student Affairs and the Assistant Director for Undergraduate Studies in the School of Engineering at Stanford. For more information, please see the transfer credit section of the School of Engineering Undergraduate Handbook website at http://ughb.stanford.edu.

DEGREE PROGRAM OPTIONS

3/2 DEGREE PROGRAMS

The 3/2 engineering program at Stanford is a special opportunity that allows a student to complete three years at a liberal arts college followed by two years at Stanford. After completing the five-year program, the student is awarded two degrees, a B.S. in Engineering from Stanford and an A.B. from the liberal arts college.

Candidates for this special dual-degree program are considered as regular transfer applicants and are expected to meet the same admissions standards as all other transfer candidates. This distinguishes the Stanford 3/2 program from those of most other institutions that “guarantee” admission to students who meet certain grade and course requirements and are recommended by the 3/2 coordinator of the liberal arts college.

All 3/2 transfer applicants are required to submit the transfer application forms, a final secondary school transcript, official transcripts from each college attended, and the official results of either the College Board Scholastic Aptitude Test (SAT) or the American College Test (ACT). All materials must be submitted by the regular transfer deadline.

In addition to the above mentioned documents, dual-degree candidates are required to have a letter of recommendation sent from the liberal arts college 3/2 program coordinator. Also required is a letter from the appropriate academic dean indicating the intention of the liberal arts college to award the A.B. degree, not the B.S. degree, upon completion of the required number of course credits. Applications are only accepted from students attending a liberal arts college that does not offer a degree program in engineering.

BACHELOR OF ARTS AND SCIENCE (B.A.S.)

This degree is available to students who complete both the requirements for a B.S. degree in engineering and the requirements for a major or program ordinarily leading to the A.B. degree. For more information, see the “Graduate Degrees” section of this bulletin.

DUAL AND COTERMINAL DEGREE PROGRAMS

A Stanford undergraduate may work simultaneously toward two bachelor’s degrees or toward a bachelor’s and a master’s degree, that is, A.B. and M.S., A.B. and A.M., B.S. and M.S., or B.S. and A.M. The degrees may be granted simultaneously or at the conclusion of different quarters. Usually five years are needed for a combined program.

Dual A.B. and B.S. Degree Program—To qualify for both degrees, a student must (1) complete the stated University and department requirements for each degree, (2) complete 15 full-time quarters, or three full-time quarters after completing 180 units, and (3) complete a total of 225 units (180 units for the first bachelor’s degree plus 45 units for the second bachelor’s degree).

Coterminal Bachelor’s and Master’s Degree Program—A Stanford undergraduate may be admitted to graduate study for the purpose of working simultaneously toward a bachelor’s degree and a master’s degree. To qualify for both degrees, a student must (1) complete three full-time quarters (or the equivalent) after completing 180 units, (2) complete, in addition to the 180 units required for the bachelor’s degree, the number of units required by the graduate department for the master’s degree (not fewer than the University minimum of 36 units), (3) complete the requirements for the bachelor’s degree (department, school, and University) and apply for the degree at the appropriate time at the Office of the Registrar, and (4) complete the department and University requirements for the master’s degree and apply for the degree at Degree Progress in the Registrar’s Office.

Admission to the coterminal program requires admission to graduate status by the pertinent department. Admission criteria vary from department to department.

Procedure for Applying for Admission to Coterminal Degree Programs—A Stanford undergraduate may apply (using the University coterminal application form) for admission to the coterminal bachelor’s and master’s degree program after the beginning of the eighth quarter of undergraduate work and no later than the end of the 11th quarter of undergraduate work, and at least four quarters in advance of the anticipated date of conferment of the master’s degree. Students seeking a graduate degree in engineering must apply to the pertinent department.

BACHELOR OF SCIENCE

Departments within the School of Engineering offer programs leading to the B.S. degree in the following fields: Chemical Engineering, Civil Engineering, Computer Science, Electrical Engineering, Environmental Engineering, Industrial Engineering, Materials Science and Engineering, and Mechanical Engineering. The School of Engineering itself offers interdisciplinary programs leading to the B.S. degree in Engineering with specializations in Aeronautics and Astronautics, Computer Systems Engineering, and Product Design. In addition, students may elect an Individually Designed Major leading to the B.S. in Engineering.

Petroleum Engineering—Petroleum Engineering is offered by the School of Earth Sciences. Consult the “Petroleum Engineering” section of this bulletin for requirements.

School of Engineering majors who anticipate summer jobs or career positions associated with the oil industry may wish to consider enrolling in Engineering 120, Fundamentals of Petroleum Engineering.

Programs in Manufacturing—Programs in manufacturing are available at the undergraduate, M.S., and Ph.D. levels. The undergraduate programs of the departments of Civil and Environmental Engineering, Management Science and Engineering, and Mechanical Engineering provide general preparation for any student interested in manufacturing. More specific interests can be accommodated through Individually Designed Majors (IDMs).

SCHOOL OF ENGINEERING MAJORS

The School of Engineering offers the degree of Bachelor of Science in Engineering. School of Engineering programs must be approved by the Undergraduate Council of the school. There are two types of programs: majors that have been proposed by cognizant faculty groups and have been approved by the council, and Individually Designed Majors. At present, there are three preapproved majors: Aeronautics and Astronautics, Computer Systems Engineering, and Product Design. Total units required for these majors must be at least 90 and not more than 107. These majors are not accredited by ABET.

AERONAUTICS AND ASTRONAUTICS (AA)

Mathematics: (21 units)
- Math. 35 or 130, or Mech. Engr. 100. Differential Equations 3-5
- Math electives (See Basic Requirement 1)

Science: (18 units)
- Physics 41. Mechanics 3
- Physics 43 or 23. Electricity 3
- One further physics course 3
- Science electives (see Basic Requirement 2) 9

Engineering Fundamentals: (five courses)
- Engr. 30. Engineering Thermodynamics 3
- Engr. 70A. or 70X. Programming 5
- Engr. 15. Dynamics 3
- Two Fundamental courses (See Basic Requirement 3)

Technology in Society: (3-5 units)
- One course (See Basic Requirement 4)

Engineering Depth: (39 units)
- AA 100. Introduction to Aeronautics and Astronautics 3
- AA 190. Directed Research in Aeronautics and Astronautics 3
- Civ. & Envr. Engr. 180A. Introduction to Structural Analysis or Mech. Engr. 111. Stress, Strain, and Strength 3

97
Engr. 104. Dynamic Behavior  
or Mech. Engr. 161. Dynamic Systems  
or Phys. 110. Intermediate Mechanics  
Mech. Engr. 33. Introduction to Fluids Engineering  
Mech. Engr. 131A. Heat Transfer  
Mech. Engr. 131B. Fluid Mechanics  
Depth Area I*  
Depth Area II*  
Engineering Electives†  
Total .................................. 100-106  
* Two of the following areas:  
Fluids (AA 200A, 210A, 214A, 280 or 283; Mech. Engr. 131C)  
Structures (AA 240A, 240B, 256)  
Dynamics and Controls (AA 271A, Engr. 105, 205)  
Systems Design (AA 241A, 241B, 236A, 236B)  
† Electives are to be approved by the adviser, and might be from the Depth area lists, or courses such as AA 201A, 210B, 252; Engr. 206, 209A, 209B; or other upper-division engineering courses.

COMPUTER SYSTEMS ENGINEERING (CSE)  
Mathematics: (23 units)  
Math. 41, 42, 51. Calculus  
Math. 52 or 53. Multivariable Math  
Math. 103 or 113. Linear Algebra*  
Science: (13 units)  
Phys. 41. Mechanics  
Phys. 43. Electricity  
Phys. 45. Magnetism  
Phys. 47. Light and Heat  
Engineering Fundamentals: (10 units)  
Engr. 40. Electronics  
Engr. 70X. Programming Methodology and Abstractions  
or Comp. Sci. 106A and B  
Technology in Society: (3-5 units)  
one course (See Basic Requirement 4)  
Writing in the Major (one course)  
Comp. Sci. 191W, 194, and 201 fulfill this requirement  
Depth: (53 units)  
Comp. Sci. 103A. Discrete Mathematics for CS  
Comp. Sci. 103B. Discrete Structures  
Comp. Sci. 107. Programming Paradigms  
Comp. Sci. 108. Object-Oriented Systems Design  
Comp. Sci. 140. Operating Systems  
or Comp. Sci. 143. Compilers  
Elect. Engr. 101. Circuits  
Elect. Engr. 111, 112. Electronics  
Elect. Engr. 121. Digital Design Laboratory  
Elect. Engr. 182. Computer Organization  
Elect. Engr. 183. Advanced Logic Laboratory  
Elect. Engr. 271. Introduction to VLSI Systems  
Electives*  
Senior Project (Comp. Sci. 191, 191W, or 194) **  
Total .................................. 102-104  
* Completion of Math. 52 and 53 will satisfy the Math. 103/113 requirement.  
† The list of approved electives is reviewed annually by the CS Undergraduate Program Committee. The current list consists of CS 110, 121 or 221, 137, 140, 143, 145, 147, 148 or 248, 154, 157, 161, 205, 206, 222, 223A, 223B, 224A, 224M, 225A, 225B, 226, 227, 228, 229 240, 242, 243, 244A, 245, 247A, 247B, 249, 255, 256, 257, 258, 261, 270A, 270B, 271, 272, 274; Elect. Engr. 212, 216, 247, 264, 272, 278, 282  
** Independent study projects (Comp. Sci. 191, or 191W) require faculty sponsorship and must be approved in advance by the adviser, faculty sponsor, and the CSE program adviser (E. Roberts). A signed approval form, along with a brief description of the proposed project, should be filed at least two quarters before graduation. Further details can be found in the Handbook for Undergraduate Engineering Programs at http://ughb.stanford.edu.

PRODUCT DESIGN  
Mathematics: 20 units minimum  
Recommended: one course in Statistics  
Science: 17 units minimum  
Recommended: one year of Physics  
Psy. 1. Introduction to Psychology (required)  
Psy. 161. Cultural Psychology (required)  
Mathematics and Science: minimum combined total of 45 units  
Engineering Fundamentals: 18 units minimum  
Engr. 40, 70 required, plus remainder of course work from  
Engr. 10, 15, 20, 25, 30, 50, 60; Manage. Sci. & Engr. 100, 133  
Technology in Society:  
Mech. Engr. 120. History of Philosophy of Design (required)  
Engineering Depth: 45 units  
Art & Art Hist. 60. Basic Design  
Art & Art Hist. 160. Intermediate Design  
Art & Art Hist. 161 or 70 (recommended)  
Art Studio courses (two)  
Engr. 102M  
Mech. Engr. 103. Manufacturing and Design  
Mech. Engr. 103D. Engineering Drawing  
Mech. Engr. 111. Stress, Strain, and Strength  
Mech. Engr. 112. Mechanical Systems  
Mech. Engr. 115. Human Values in Design  
Mech. Engr. 110A. Design Sketching  
or 116D. Advanced Design Sketching  
Mech. Engr. 116A. Advanced Product Design  
Mech. Engr. 116B. Advanced Product Design  
Mech. Engr. 116C. Advanced Product Design†  
Total maximum units .................................. 107  
* One quarter abroad may substitute for this course.  
† Combined Product Design/Mech. Engr. students.

INDIVIDUALLY DESIGNED MAJORS (IDMs)  
IDMs are intended for undergraduates interested in pursuing engineering programs that, by virtue of their focus and intellectual content, cannot be accommodated by existing departmental majors or the preapproved School of Engineering majors. IDM curricula are designed by students with the assistance of two faculty advisers of their choice and are submitted to the Undergraduate Council’s Subcommittee on Individually Designed Majors. The degree conferred is “Bachelor of Science in Engineering: (approved title).”

Students must submit written proposals to the IDM Subcommittee detailing their course of study. Programs must meet the following requirements: mathematics (21 units minimum, see Basic Requirement 1 below), science (17 units minimum, see Basic Requirement 2 below), Technology in Society (one approved course, see Basic Requirement 4 below), engineering (40 units minimum), and sufficient relevant additional coursework to bring the total number of units to at least 90 and at most 107. (Students may take additional courses pertinent to their IDM major, but the IDM proposal itself may not exceed 107 units.) The student’s curriculum must include at least three “Engineering Fundamentals” courses (Engineering 10, 14, 15, 20, 25, 30, 40, 50, 60, 70A, and 70X). Students are responsible for completing the prerequisites for all courses included in their majors.

Each proposal should begin with a statement describing the proposed major. In the statement, the student should make clear the motivation for and goal of the major, and indicate how it relates to her or his projected career plans. The statement should also specify how the various courses to be taken relate to and move the student toward realizing the major’s goal. A proposed title for the major should be included. The title approved by the IDM Subcommittee will be listed on the student’s official University transcript.

The proposal statement should be followed by a completed Program Sheet listing all the courses comprising the student’s IDM curriculum, organized by the five categories printed on the sheet (mathematics, science, Technology in Society, additional courses, and engineering depth). Normally, the courses selected should comprise a well-coordinated sequence or sequences that provide mastery of important principles and techniques in a well-defined field. In some circumstances, especially if the proposal indicates that the goal of the major is to prepare the student for graduate work outside of engineering, a more general engineering program may be appropriate. A four-year study plan, showing which courses will be taken each quarter should also be included in the student’s IDM proposal.

The proposal must be signed by two faculty members whose signatures certify that they endorse the major as described in the proposal and that they agree to serve as the student’s permanent advisers. One of the faculty members, who must be from the School of Engineering, acts as the student’s primary adviser. The proposal must be accompanied by a statement from that person giving her or his appraisal of the academic value and viability of the proposed major.

Students proposing IDMs must have at least four quarters of undergraduate work remaining at Stanford after the quarter in which their proposals are first submitted. Any changes in a previously approved major must be endorsed by the advisers and reapproved by the IDM subcommittee. A request by a student to make changes in her or his approved curriculum must be made sufficiently far in advance so that, should the
request be denied, adequate time remains to complete the original, approved curriculum. Proposals are reviewed and acted upon once a quarter. Forms may be obtained from, and completed proposals should be submitted to, the Office of the Senior Associate Dean for Student Affairs, Terman 201.

DEPARTMENT MAJORS

Curricula for majors offered by the departments of Chemical Engineering, Civil Engineering, Electrical Engineering, Management Science and Engineering, Materials Science and Engineering, and Mechanical Engineering have the following components: 40-47 units of mathematics and science (see Basic Requirements 1 and 2 at the end of this section); engineering fundamentals (three course minimum, at least one of which must be unspecified by the department, see Basic Requirement 3); Technology in Society (TIS) (one course minimum, see Basic Requirement 4); engineering depth (courses such that the total of units for Engineering Fundamentals and Engineering Depth is between 60 and 75). Included within the courses taken to fulfill the preceding curriculum components is a requirement for a minimum of 8 units of experimentation (see below). Curricular requirements for departmental majors were being revised at the time of publication. Please consult the 2000-01 Handbook for Undergraduate Engineering Programs online at http://ughb.stanford.edu for the most up-to-date listing of curricular requirements.

The curriculum for the major offered by the Department of Computer Science has separate requirements as described below.

**Experimentation**—Departmental major programs other than Computer Science must include 8 units of experimentation. Lab courses taken in the sciences, as well as experimental work taken in courses within the School of Engineering, can be used in fulfillment of this requirement. By careful planning, the experimentation requirement should not necessitate additional course work beyond that required to meet the other components of an engineering major. A list of courses and their experimentation content (in units) can be found online at http://ughb.stanford.edu in the 2000-01 Handbook for Undergraduate Engineering Programs.

### CHEMICAL ENGINEERING

**Course No. and Subject**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math. 41, 42, 51, 52, Calculus</td>
</tr>
<tr>
<td>Math. 53, Ordinary Differential Equations or Engr. 155A</td>
</tr>
</tbody>
</table>

**Science:**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biol. Sci. 52, Biochemistry, Molecular Biology, and Cell Biology</td>
</tr>
<tr>
<td>Chem. 31, Chemical Principles</td>
</tr>
<tr>
<td>Chem. 33, Structure and Reactivity</td>
</tr>
<tr>
<td>Chem. 35, Organic Monofunctional Compounds</td>
</tr>
<tr>
<td>Chem. 36, Chemical Separations</td>
</tr>
<tr>
<td>Chem. 131, Organic Polynuclear Compounds</td>
</tr>
<tr>
<td>Chem. 171, Physical Chemistry: Chemical Thermodynamics</td>
</tr>
<tr>
<td>Phys. 41, Mechanics</td>
</tr>
<tr>
<td>Phys. 43, Electricity</td>
</tr>
<tr>
<td>Phys. 45, Magnetism</td>
</tr>
</tbody>
</table>

**Engineering Fundamentals:**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five courses (Engr. 20 excluded)</td>
</tr>
</tbody>
</table>

Technology in Society (one course): (See Basic Requirement 4)

### CIVIL ENGINEERING [CEE]

**Mathematics and Science:**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 units minimum* (See Basic Requirements 1 and 2)</td>
</tr>
</tbody>
</table>

**Technology in Society (one course):** (See Basic Requirement 4)

**Engineering Fundamentals:**

| Three courses (See Basic Requirement 3) |
| 9-11 |

**Engineering Depth**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEE 70. Environmental Science and Technology</td>
</tr>
<tr>
<td>CEE 100. Managing Civil Engineering Projects</td>
</tr>
<tr>
<td>CEE 101A. Mechanics of Materials</td>
</tr>
<tr>
<td>CEE 101B. Mechanics of Fluids</td>
</tr>
<tr>
<td>CEE 101C. Geotechnical Engineering</td>
</tr>
</tbody>
</table>

**Specialty courses in either Environmental and Water Studies**, or Structures and Construction:**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
</tr>
</tbody>
</table>

**Other School of Engineering Electives**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-8</td>
</tr>
</tbody>
</table>

**Total for Engineering Fundamentals plus Depth**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
</tr>
</tbody>
</table>

---

| * Mathematics must include Engr. 155A and Stat 190. Science must include Physics 41, Chem. 31, and Geol. & Envir. Sci. 1. For students in the Environmental and Water Studies track, Chem. 33 also is required. |
| ** Fundamentals must include Engr. 14 and 60. |

### COMPUTER SCIENCE [CS]

**Mathematics:**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 103X, Discrete Structures (Accelerated) or CS 103A and 103B</td>
</tr>
<tr>
<td>Math. 41, 42, Calculus*</td>
</tr>
<tr>
<td>Stat. 116, Theory of Probability or Manage. Sci. &amp; Engr. 120. Problem Analysis</td>
</tr>
</tbody>
</table>

**Plus any two of the following:**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 157. (or Phil. 160A) Logic</td>
</tr>
<tr>
<td>CS 205. Math for Robotics and Vision</td>
</tr>
<tr>
<td>Math. 51, Calculus</td>
</tr>
<tr>
<td>Math. 103 or 113 Linear Algebra</td>
</tr>
</tbody>
</table>

**Science:**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>(12 units)</td>
</tr>
<tr>
<td>Phys. 41, Mechanics</td>
</tr>
<tr>
<td>Phys. 43, Electricity</td>
</tr>
<tr>
<td>Phys. 45, Magnetism</td>
</tr>
<tr>
<td>Science Elective†</td>
</tr>
</tbody>
</table>

**Engineering Fundamentals:**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 106X. Programming Methodology and Abstractions (Accelerated) or CS 106A and 106B</td>
</tr>
<tr>
<td>Engr. 40. Electronics</td>
</tr>
</tbody>
</table>

**Technology in Society (one course, 3-5 units):**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>See Basic Requirement 4</td>
</tr>
</tbody>
</table>

**Writing in the Major (one course)**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 191W, 194, and 201 fulfill this requirement</td>
</tr>
</tbody>
</table>

**Computer Science depth: (43 units minimum)**

**Programming (two courses):**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 107. Programming Paradigms</td>
</tr>
<tr>
<td>CS 108. Object-Oriented Systems Design</td>
</tr>
</tbody>
</table>

**Theory (two courses):**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 154. Introduction to Automata and Complexity Theory</td>
</tr>
<tr>
<td>CS 161. Design and Analysis of Algorithms</td>
</tr>
</tbody>
</table>

**Systems (three courses):**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elect. Engr. 182. Computer Organization</td>
</tr>
<tr>
<td>Two systems electives**</td>
</tr>
</tbody>
</table>

**Applications (two courses):**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 121 or 221. Introduction to Artificial Intelligence</td>
</tr>
<tr>
<td>One applications elective††</td>
</tr>
</tbody>
</table>

**Project (one course):**

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 191, 191W, or 194***</td>
</tr>
<tr>
<td>Restricted Electives (two or three courses)†††</td>
</tr>
</tbody>
</table>

---

* Math. 19, 20, and 21 may be taken instead of Math. 41 and 42 as long as at least 25 math units are taken. 
† The science elective may be any course of 3 or more units from the School of Engineering lists plus Psych 30 or 40, AP Biology or Chemistry also meets this requirement. Either of the Physics sequences 61/63 or 21/23 may be substituted for 41/43/45 as long as at least 12 science units are taken. 
** The two systems courses must be chosen from the following set: CS 140, 143, 242, and 244A. The systems electives must include a course with a large software project, currently satisfied by either CS 140 or 143. 
†† The applications elective must be chosen from the following set: CS 145, 147, 148, 223A, 223B, 224A, 224B, 224C. 
*** Independent study projects (CS 191 or 191W) require faculty sponsorship and must be approved by the advisor, faculty sponsor, and the CS program advisor (E. Roberts).
ENGINEERING DEPTH:

Engineering Fundamentals:

Technology in Society: one course

Mathematics:

- Statistics: EE 177 or EE 178

- Math or Science Electives: 3-4

Total Math and Science Units: 45

Math: 41, 42, 51, 52, 53

Science:

- Physics: (41, 43, 45, 47) or (61, 63, 65)

Statistics: EE 177 or EE 178

- Math or Science Electives: 3-4

Total for Engineering Fundamentals plus Depth: 45

Electrical Engineering electives: 9-14

Total Engineering depth required: 58

- These requirements are subject to change. The final requirements are published along with example programs in the School of Engineering Undergraduate Handbook during the summer.

- The Statistics course can count either as a Math and Science elective or as an Electrical Engineering elective, but not both.

- Three courses from one of the specialty areas shown below (consultation with an advisor in the selection of these courses is especially important).

- Computer Hardware: EE 144 (Comp. Sci. 107), 182 (183 or 281), 271 or 275

- Computer Software: EE 184 (Comp. Sci. 107), 189A (Comp. Sci. 108), 189B (Comp. Sci. 194), 284 or Comp. Sci. 244A

- Controls: Engr. 105, EE 205 (Engr. 205), EE 206 (Engr. 206), EE 209 (Engr. 209)

- Electronics: EE 133, 212, 214, 216

- Fields and Waves: EE 141

- Signal Processing and Communication: EE 104, 133, 144, 183, 281; Engr. 206.

- Additional course not in EE or Comp. Sci. 3-5

- Engineering Depth:

- Circuits and Systems: EE 101, 102, 103

- Laboratory: EE 121, 122

- Technical Writing: Engr. 102E

- One course in Design†

- Total for Engineering Electives: 9-14

- Total for Engineering Fundamentals plus Depth: 68

† The design course may be, but need not be, part of the specialty sequence. The following courses satisfy this requirement: EE 189B (Comp. Sci. 194), 133, 144, 183, 281; Engr. 206.

ENVIRONMENTAL ENGINEERING (in CEE)

Mathematics and Science:

- 45 unit minimum* (See Basic Requirement 1 and 2)

- Technology in Society† (one course): (See Basic Requirement 4)

Engineering Fundamentals:

- Three courses** (See Basic Requirement 3) 9-11

Engineering Depth:

- CEE 64. Air Pollution: From Urban Smog to Global Change

- CEE 70. Environmental Science and Technology

- CEE 100. Managing Civil Engineering Projects

- CEE 101B. Mechanics of Fluids

- CEE 101E. Analytical and Numerical Methods for the Environment

- CEE 160. Fluid Mechanics Laboratory

- CEE 161. Open Channel and Pipe Flows

- CEE 162. Hydrology and Water Resources

- CEE 171. Environmental Planning Methods

- CEE 172. Air Quality Management

- CEE 177. Aquatic Chemistry and Biology

- Capstone design experience (either CEE 169, or CEE 179A & B)

- CEE Breadth Electives†† 8

- Other School of Engineering Electives 6-8

- Total for Engineering Fundamentals plus Depth: 68

* Mathematics must include CEE 101D, Engr. 155A, and Stat. 190. Science must include Physics 41; Chem. 31, 33; and Geol. & Envir. Sci. 1.

† Must choose a class that specifically includes an ethics component, such as STS 101, 110, 115, 170 or 215.

** Fundamentals must include Engr. 30 and 60.


MANAGEMENT SCIENCE AND ENGINEERING (MS&E)

Mathematics: 28 units minimum* (See Basic Requirement 1)

- Math. 41

- Math. 42

- Math. 51 or Math. 43

- Stat. 110 (Stat. 110 is recommended) 4-3

- MS&E 120

- MS&E 121

Science: 14 units minimum* (See Basic Requirement 2)

- Engineering Fundamentals: five courses (See Basic Requirement 3)

- Comp. Sci. 106A

- Engr. 40.

- Engr. 60.

- Two other engineering fundamentals from School of Engineering approved list

- Technology in Society: one course† (See Basic Requirement 4)

- Engineering Depth:

- Comp. Sci. 106B or 106X. Programming Abstractions

- Engr. 62. Introduction to Optimization

- MS&E 180. Organizations: Theory and Management

- MS&E 108 or 131. Senior Project or Information Science

- MS&E 242 or 245E or 245G. Investment Science/Finance

- Concentration Depth (choose one of the following five

- Concentrations):

- Industrial Engineering/Operations Management Concentration**: 27-29

- MS&E 130. Information Systems

- MS&E 160. Industrial Accounting

- MS&E 161. Analysis of Production and Operating Systems

- MS&E 164. Manufacturing Systems Design

- MS&E 169. Quality Assurance and Control

- Two electives from MS&E approved list††† 23-30

- Operations Research Concentration: 26-29

- Math. 52. Ordinary Differential Equations with Linear Algebra

- Four of the following nine courses:

- MS&E 107. Interactive Management Science

- MS&E 152. Introduction to Decision Analysis

- MS&E 201. Dynamic Systems

- MS&E 211. Linear and Nonlinear Optimization

- MS&E 212. Network Integer Programming

- MS&E 222. Probabilistic Analysis II

- MS&E 223. Simulation

- MS&E 224. Stochastic Models in Operations Research

- MS&E 251. Stochastic Decision Models

- One of the following three courses:

- Comp. Sci. 109. Introduction to Computer Science

- Comp. Sci. 137. Introduction to Scientific Computing

- Econ. 50. Economic Analysis

- MS&E 130. Information Systems

- Technology and Policy Concentration: 24-30

- Econ. 50. Economic Analysis I

- Econ. 51. Economic Analysis II

- Econ. 150/Pol. 104. Economics and Public Policy

- One of the following three courses:

- MS&E 197. Ethics and Public Policy

- MS&E 267. Legal Strategy and Analysis

- Pol. Sci. 182F. Introduction to American Law

- One of the following two courses:

- MS&E 193. Role of Technology in National Security


- One of the following four courses:

- MS&E 194. The Role of Analysis in Environmental Policy Decisions

- MS&E 196. Transportation Systems and Urban Development

- MS&E 297. Progress in Worldwide Telecommunications

- MS&E 298. Technology Policy and Management in Newly Developed Countries

- Financial and Decision Engineering Concentration: 27-29

- MS&E 140. Industrial Accounting

- MS&E 152. Introduction to Decision Analysis

- MS&E 242. Investment Science

- One of the following three courses:

- Econ. 50. Economic Analysis I

- Econ. 51. Economic Analysis II

- Econ. 150/Pol. 104. Economics and Public Policy

- One of the following three courses:

- MS&E 197. Ethics and Public Policy

- MS&E 267. Legal Strategy and Analysis

- Pol. Sci. 182F. Introduction to American Law
Six of the following ten courses (including at least four of
Engr. 131, 145; MS&E 130, 164, 181, 182, 284):
Engr. 131. Ethical Issues in Engineering
Engr. 145. Introduction to High Technology
Engr. 161. Introduction to Mechatronics
Psych. 70. Introduction to Social Psychology
MS&E 130. Information Systems
MS&E 164. Manufacturing Systems Design
MS&E 181. Issues in Technology and Work in Post-Industrial Economics
MS&E 182. Work, Technology, and Society
MS&E 284. Technology and Work
Soc. 128. Groups, Teams, and Organizations
Soc. 160. Formal Organizations

*B Math and science must total 45 units. Electives must come from Self approved list.
** Technology in Society courses must be one of the following MS&E approved courses:
STS 101/Engr. 130, STS 110/MS&E 197, STS 115/Engr. 131, STS 135/MS&E 181, STS 162, STS 170/MS&E 182, STS 171/MS&E 193, STS 215, STS 279/MS&E 298.
** Students choosing the Industrial Engineering/Operations Management Concentration who meet the ABET requirement by taking or placing out of one year of Physics or Chemistry and other 18 quarters in the other discipline, will receive the Industrial Engineering Concentration. Students who do not meet the ABET requirements will receive the Operations Management Concentration.

MATERIALS SCIENCE AND ENGINEERING (MSE)
Mathematics: 21 units minimum
Science: 20 units minimum
Engineering Fundamentals (five courses): (See Basic Requirement 1)
Technology in Society (one course): (See Basic Requirement 4)

Engineering Depth:
MSE 151. Structural Materials Engineering 3
MSE 152. Electronic Materials Engineering 3
MSE 161. Materials Science Lab I 4
MSE 162. Materials Science Lab II 4
MSE 163. Materials Science Lab III 3
Materials Science Fundamentals* 24
Science and Engineering Options† 9
Total: 49

*MSE Fundamentals: 24 units from MSE 191, 192, 193, 194, 195, 196, 197, 198, 199
† MSE Fundamentals from one of the following six areas:
Chemistry (Chem. 151, 153, 171, 173, 175)
Chemical Engineering (Chem. Engr. 110, 120A, 120B, 160, 170)
Electrical Engineering (Elect. Engr. 101, 102, 111, 112, 113, 141, 142, Engr. 40)
Mechanical Engineering (Engr. 14, 15, Mech. Engr. 103, 111, 131A, 131B, 161)
Physics (Phys. 110, 111, 120, 121, 122, 130, 131, 132, 170, 171, 172)
Self-Defined Option (petition for a self-defined cohesive program, minimum of 9 units)

MECHANICAL ENGINEERING (ME)
Mathematics: 24 units minimum* (See Basic Requirement 1)
Science: 18 units minimum* (See Basic Requirement 2)
Engineering Fundamentals (five courses):† (See Basic Requirement 3)
Technology in Society (one course): (See Basic Requirement 4)

Engineering Depth:
ME 33. Introductory Fluids Engineering 1
ME 101. Visual Thinking 3
ME 103. Manufacturing Technology 4
ME 111. Stress, Strain, and Strength 3
ME 112. Mechanical Systems Design 4
ME 113. Engineering Design 3
ME 131A. Heat Transfer 4
ME 131B. Fluid Mechanics 3
ME 140. Integrated Thermal Systems or Engr. 104. Dynamic Behavior 3
ME 161. Mechanical Vibrations 4
Total: 42

Options to complete the ME Depth sequence (pick two items below):
Engr. 105A. Control Systems 3
ME 106. Vehicle Dynamics and Control 3
ME 117. Introduction to Sensors 3
ME 118. Introduction to Mechatronics 4
ME 130. Internal Combustion Engines 4
ME 134. Modern Experimentation 3
ME 131C. Thermodynamics 3
ME 180. Skeletal Development and Evolution 3
ME 181. Biomechanics of Movement 3

*B Math and science must total 45 units. Math: 24 units required and must include a course in differential equations (e.g., ME 100). Science: 18 units minimum and must include chemistry and physics, with at least one year’s study in one of them. Engr. 15, 30, 40, 70 are required.

BASIC REQUIREMENTS

Basic Requirement 1 (Mathematics)—Engineering students need a solid foundation in the calculus of continuous functions including differential equations, an introduction to discrete mathematics, and an understanding of statistics and probability theory. The minimum preparation should normally include calculus to the level of Mathematics 43. Knowledge of ordinary differential equations and matrices is important in many areas of engineering, and students are encouraged to select additional courses in these topics. To meet ABET accreditation criteria, a student’s program must include the study of differential equations.

Courses that satisfy the mathematics requirement are listed online at http://ugb斯坦福工程学院的Handbook for Undergraduate Engineering Programs.

Basic Requirement 2 (Science)—A strong background in the basic concepts and principles of natural science in such fields as biology, chemistry, geology, and physics is essential for engineering. Most students include the study of physics and chemistry in their programs. To meet ABET accreditation criteria, a student’s program must include study of both chemistry and physics, with at least one year’s study in one of them.

Courses that satisfy the science requirement are listed online at http://ugb斯坦福工程学院的Handbook for Undergraduate Engineering Programs.

Basic Requirement 3 (Engineering Fundamentals)—The Engineering Fundamentals requirement is satisfied by a nucleus of technically rigorous introductory courses chosen from the various engineering disciplines. It is intended to serve several purposes. First, it provides students with a breadth of knowledge concerning the major fields of endeavor within engineering. Second, it allows the incoming engineering student an opportunity to explore a number of courses before embarking on a specific academic major. Third, the individual classes each offer a reasonably deep insight into a contemporary technological subject for the interested non-engineer.

The requirement is met by taking five courses from the following list:
Engr. 10. Introduction to Engineering Analysis
Engr. 14. Applied Mechanics: Statics and Deformables or Engr. 15. Dynamics
Engr. 20. Introduction to Chemical Engineering
Engr. 25. Biotechnology
Engr. 30. Engineering Thermodynamics
Engr. 70A or 70X. Introduction to Software Engineering

Basic Requirement 4 (Technology in Society)—It is important for the student to obtain a broad understanding of engineering as a social activity. To foster this aspect of intellectual and professional development, all engineering majors must take one course devoted to exploring issues arising from the interplay of engineering, technology, and society. Courses that fulfill this requirement are listed online at http://ugb斯坦福工程学院的Handbook for Undergraduate Engineering Programs.

MINORS

An undergraduate minor in Engineering may be pursued by interested students in many of the School's departments; consult with a department's undergraduate program representative, or the Office of Student Affairs, Terman Engineering Center, room 201. General requirements and policies for a minor in the School of Engineering are: (1) a set of courses totaling not less than 18 and not more than 36 units, with a minimum of six courses of at least 3 units each; (2) the set of courses should be sufficiently coherent as to present a body of knowledge within a discipline or subdiscipline; (3) prerequisite mathematics, statistics, or science courses, such as those normally used to satisfy the School’s requirements for a department major, may not be used to satisfy the requirements
of the minor; conversely, engineering courses that serve as prerequisites for subsequent courses must be included in the unit total of the minor program; (4) departmentally based minor programs are structured at the discretion of the sponsoring department, subject only to requirements 1, 2, and 3 above. Interdisciplinary minor programs may be submitted to the Undergraduate Council for approval and sponsorship. A “General Engineering” minor is not offered.

AERONAUTICS AND ASTRONAUTICS (AA)

The Aero/Astro minor introduces undergraduates to the key elements of modern aerospace systems and their many spinoff technologies. Within the minor, students may focus on aircraft, spacecraft, or disciplines relevant to both. The course requirements for the minor are described in detail below. Courses cannot be double-counted within a major and a minor, or within multiple minors; if necessary, the Aero/Astro advisor can select substitute courses to fulfill the AA minor core.

The following core courses fulfill the minor requirements:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engr.30. Thermodynamics*</td>
<td>3</td>
</tr>
<tr>
<td>Mech. Engr.33. Introductory Fluids</td>
<td>4</td>
</tr>
<tr>
<td>Mech. Engr.131A. Heat Transfer</td>
<td>5</td>
</tr>
<tr>
<td>Core Total</td>
<td>12-25</td>
</tr>
</tbody>
</table>

* Engr. 14, 15, or 30 are waived as minor requirements if already taken as part of the major.

The following courses are upper-division electives.

| Two courses from one of the elective areas below | 6 |
| Two course from a second area | |
| Program Total | 21-34 |

Fluids:

- AA 200A. Applied Aerodynamics
- AA 210A. Fund of Compressible Flow
- AA 214A. Numerical Methods in Fluid Mechanics
- AA 280. Rocket Propulsion
- or AA 283. Aircraft Propulsion

Structures:

- AA 240A. Analysis of Structures
- AA 240B. Analysis of Structure - II
- AA 256. Mechanics of Composites

Dynamics and Controls:

- AA 271. Dynamics and Control of Spacecraft/Aircraft
- AA 279. Space Mechanics
- Engr. 105. Feedback Control Design
- Engr. 205. Introduction to Control Design Techniques

Aerospace Systems Synthesis/Design:

- AA 236A.B. Aircraft Propulsion
- AA 236A.B. Aircraft Design
- AA 241A.B. Aircraft Design

CHEMICAL ENGINEERING

The following courses fulfill the minor requirements:

- Chem. Engr. 100. Chemical Process Modeling, Dynamics, and Control
- Chem. Engr. 110. Equilibrium Thermodynamics
- Chem. Engr. 120A. Fluid Mechanics
- Chem. Engr. 120B. Energy and Mass Transport
- Chem. Engr. 140. Microelectronics Processing Technology
- or Chem. Engr. 150. Biochemical Engineering
- or Chem. Engr. 160. Polymer Science and Engineering
- Chem. Engr. 185A. Chemical Engineering Lab
- Chem. Engr. 185B. Chemical Engineering Lab
- Chem. 171. Physical Chemistry
- Engr. 20. Introduction to Chemical Engineering

Total | 35

CIVIL ENGINEERING (CEE)

The Civil Engineering minor is intended to give students an in-depth introduction to one or more areas of civil engineering. Departmental expertise and undergraduate course offerings are available in the areas of Construction Engineering and Management and Structural Engineering. The necessary prerequisites for a civil engineering minor are Physics 41 and Mathematics 41, 42, and 51. Students should recognize that a minor in Civil Engineering is not an ABET-accredited degree program.

Since civil engineering is a very broad field and undergraduates having widely varying backgrounds may be interested in obtaining a civil engineering minor, no single set of course requirements is appropriate for all students. Instead, interested students are encouraged to propose their own set of courses within the guidelines listed below; this list must be officially approved by the CEE undergraduate minor advisor. Additional information on preparing a minor program, including “example” programs focusing on each of the areas of expertise listed above is available in the CEE office (Terman M-42). While each example program focuses on a different area of expertise within the department, other combinations of courses are also possible.

General guidelines are:

1. A Civil Engineering minor must contain at least 24 units of course work not taken for the major, and must consist of at least six classes.
2. The list of courses must represent a coherent body of knowledge in a focused area, and should include classes that build upon one another.
3. Professor Street (Terman M-17; phone, 3-4969; e-mail street@ee) is the CEE undergraduate minor advisor, and provides guidance and advice. Students must consult with Professor Street in developing their minor program, and obtain approval of the finalized study list from him.

COMPUTER SCIENCE (CS)

The following courses fulfill the minor requirements. Prerequisites include the standard mathematics sequence through Mathematics 51.

Introductory Programming:

- CS 106A-B. Programming Method/Abstractions 10
- or CS 106X. Programming Method/Abstractions (Accelerated) 5

(4) Credit may be used to fulfill this requirement)

Core:

- CS 103A. Discrete Mathematics for CS
- CS 103B. Discrete Structures
- CS 107. Programming Paradigms
- CS 108. Object-Oriented Systems Design

Electives:

- Select two courses from different areas.

Systems:

- CS 140. Operating Systems
- CS 143. Compilers
- CS 145. Databases
- CS 148. Graphics

Theory:

- CS 154. Automata and Complexity Theory
- CS 157. Logic and Automated Reasoning
- CS 161. Design and Analysis of Algorithms

Artificial Intelligence:

- CS 121. Introduction to Artificial Intelligence
- CS 221. AI: Principles and Techniques

Numerical Computing:

- CS 137. Introduction to Scientific Computing

Human-Computer Interaction:

- CS 147. Introduction to Human-Computer Interaction Design

Note: for students with no programming background and who begin with CS 106A, the minor consists of eight courses.

ELECTRICAL ENGINEERING (EE)

Courses fulfilling the minor are from any of the following three tracks.

Option I:

- Engr. 40. Introductory Electronics
- EE 101. Circuits and Systems I
- EE 102. Circuits and Systems II
- EE 103. Introduction to Signal Processing

Four graded EE courses of level 100 or higher

Option II:

- Engr. 40. Introductory Electronics
- EE 101. Circuits and Systems I
- EE 111. Electronics I
- EE 112. Electronics II

Four graded EE courses of level 100 or higher

Option III:

- Engr. 40. Introductory Electronics
- EE 121. Digital Design Laboratory
- EE 181. Introduction to Computer Systems and Assembly Language Programming (enroll in CS 110)
- EE 182. Computer Organization and Design

Four graded EE courses of level 100 or higher
ENVIRONMENT ENGINEERING

The Environment Engineering minor is intended to give students a broad introduction to one or more areas of Environmental Engineering and Science, Environmental Fluid Mechanics and Hydrology, and Energy Engineering. Departmental expertise and undergraduate course offerings are available in the areas of Environmental Engineering. The necessary prerequisites for an engineering minor are Physics 41 and Mathematics 41, 42, and 51. Students should recognize that a minor in Environmental Engineering is not an ABET-accredited degree program. Since undergraduates having widely varying backgrounds may be interested in obtaining an environmental engineering minor, no single set of course requirements is appropriate for all students. Instead, interested students are encouraged to propose their own set of courses within the guidelines listed below; this list must be officially approved by the Civil and Environmental Engineering (CEE) undergraduate minor advisor. Additional information on preparing a minor program, including “example” programs focusing on each of the areas of expertise listed above, is available in the CEE office (Terman M-42). While each example program focuses on a different area of expertise within the department, other combinations of courses are also possible.

General guidelines are:
1. An Environmental Engineering minor must contain at least 24 units of course work not taken for the major, and must consist of at least six classes.
2. The list of courses must represent a coherent body of knowledge in a focused area, and should include classes that build upon one another.
3. Professor Street (Terman M-17; phone, 3-4969; e-mail street@ce) is the CEE undergraduate minor advisor, and provides guidance and advice. Students must consult with Professor Street in developing their minor program, and obtain approval of the finalized study list from him.

MANAGEMENT SCIENCE AND ENGINEERING (MS&E)

The following courses fulfill the minor requirements.

**Background requirements:**
- MS&E 120 or Stat. 116 (recommended)
- Math. 43 or Econ. 180
- Stat. 110 or 190

**Minor requirements:**
- Engr. 62. Introduction to Optimization
- Engr. 60. Engineering Economy (prerequisite: Math. 41)
- MS&E 121. Introduction to Stochastic Processes and Models (prerequisite: MS&E 120 or Stat. 116)
- MS&E 180. Organizational Behavior
- MS&E 169. Quality Assurance and Control (prerequisites: probability and statistical methods)
- MS&E 164. Manufacturing System Design (prerequisites: MS&E 169, 180)
- MS&E 140. Industrial Accounting (or Econ. 90 and 91)
- MS&E 160. Analysis of Production and Operational Systems (prerequisites: probability and Engr. 62)

**Materials Science and Engineering (MSE)**

A minor in Materials Science and Engineering allows interested students to explore the role of materials in modern technology and to gain an understanding of the fundamental processes that govern materials behavior.

The following courses fulfill the minor requirements.

**Fundamentals:**
- Engr. 50. Introductory Science of Materials
- MSE 151. Microstructure and Mechanical Properties
- MSE 152. Electronic Materials Engineering

**Electives (four courses from the MSE Core, 16 units):**
- MSE 191. Mathematical and Computational Methods in Materials Science
- MSE 192. Solid State Thermodynamics
- MSE 193. Atomic Arrangements in Solids
- MSE 194. Phase Equilibria
- MSE 195. Waves and Diffraction in Solids
- MSE 196. Imperfections in Crystalline Solids
- MSE 197. Rate Processes in Materials
- MSE 198. Mechanical Properties of Materials
- MSE 199. Electrical and Magnetic Properties of Solids

**Mechanical Engineering (ME)**

The following courses fulfill the minor requirements.

**General Minor**—This minor aims to expose students to the breadth of ME in terms of topics and of analytic and design activities. The minor consists of seven courses totaling 26 to 28 units. Prerequisites are Mathematics 41, 42; Physics 41.

- Engr. 15. Dynamics
- Engr. 30. Engineering Thermodynamics
- ME 33. Introductory Fluids Engineering
- ME 101. Visual Thinking
- Plus two of the following:
  - ME 103. Manufacturing and Design
  - ME 111. Stress, Strain, and Strength
  - ME 131A. Heat Transfer
  - ME 161. Dynamic Systems

**Thermosciences**—This minor consists of seven courses totaling 26 units. Prerequisites are Mathematics 41, 42, 43; Physics 41.

- Engr. 15. Dynamics
- ME 111. Stress, Strain, Strength
- ME 112. Mechanical Systems
- Plus two of the following:
  - ME 99. Mechanical Dissection
  - ME 101. Visual Thinking
  - ME 103. Manufacturing and Design
  - ME 113. Engineering Design
  - ME 117. Introduction to Sensors
  - ME 118. Introduction to Mechatronics

**Graduate Programs**

**Admission**

Application for admission with graduate standing in the school should be made to the department’s graduate admissions committee. While most graduate students have undergraduate preparation in an engineering curriculum, it is feasible to enter from other programs, including chemistry, geology, mathematics, or physics.

**Fellowships and Assistantships**—Departments and divisions of the School of Engineering award graduate fellowships, research assistantships, and teaching assistantships each year. Information and application forms may be obtained from the chair of the appropriate department or division.

**Registration**—New graduate students should follow procedures for registration as listed in the University’s quarterly Time Schedule. Adviser assignments can be obtained from department offices.

**The Honors Cooperative Program**

A number of industrial firms, government laboratories, and other organizations participate in the Honors Cooperative Program (HCP), a program that permits qualified professional employees of member companies to register for Stanford courses and obtain a graduate degree on a part-time basis.

The courses are offered by the School of Engineering on campus or through the Stanford Instructional Television Network (SITN). SITN broadcasts approximately 200 courses a year over a five-channel system to 250 corporate sites in the San Francisco and Silicon Valley area. This program enables students to receive live courses and interact by means
of a telephone talkback system from their corporate location. Students outside the local broadcast range may pursue their graduate degree by participating in SITN’s TUTored Videotape Instruction (TVI) Program. SITN offers additional programs to member companies such as Non-Credit Option (NCO), Audit Option, several certificate programs, short courses, and course licensing. For a full description of educational services provided by SITN, telephone (650) 725-3000; fax (650) 725-2868; write 401 Durand Bldg., Stanford, CA 94305-4036; or send electronic mail to na.tvt@for sythe.stanford.edu.

ENGINEERING BIOLOGY AND MEDICINE

Stanford does not have a formal department of bioengineering; however, there are several faculty in the School of Engineering whose primary research activities are in this general area. There are many opportunities in the medical and biological sciences for collaboration. Individually designed B.S. majors in bioengineering can be arranged. The faculty working in bioengineering are in various departments of the School of Engineering; a list of their names, together with a summary of their research interests, is available from the committee chair.

Students interested in pursuing graduate study in bioengineering apply for admission and financial aid to the appropriate department on the grounds of their previous training and future interests. Their applications are judged on substantially the same ground as other applicants to the department.

In addition to the standard engineering department degrees, the degree of MSE: Biomechanical Engineering is offered. Details on this program and subsequent Ph.D. studies can be obtained from the Biomechanical Engineering Division, Department of Mechanical Engineering.

The research being conducted in the field of bioengineering within the various departments reflects the technological emphasis of those departments. For instance, research on factors that influence growth and product formation in genetically engineered mammalian cells, immobilized microbial cell function and physiology in compact bioreactors, protein absorption from sheared suspensions onto polymer films, and protein conformation at fluid/polymer interfaces is pursued in the Department of Chemical Engineering. Faculty in Mechanical Engineering are doing research on aids for the disabled, bone mechanics, the mechanics of hearing, neuromuscular dynamics, orthopedic biomechanics, and rehabilitation engineering. Cardiovascular dynamics and hemodynamics are being studied in Computer Science. In Electrical Engineering, advanced analysis techniques are applied to signal processing EKG, EEG, and x-ray image. Many research projects are carried out in collaboration with faculty of the Medical School or members of the local medical community.

Both the master’s and the Ph.D. degrees are ordinarily awarded by a particular department, and the candidate must meet the degree requirements of that department. The student’s adviser assists in constructing a program of study incorporating appropriate courses in biology and medicine that also satisfy the degree requirements of the department in which the student is registered.

A student wishing to earn the M.S. in Engineering while pursuing the M.D. degree must apply separately for admission to the M.D. program and an engineering department. If the student is admitted to both, each school will encourage his or her pursuit of the other degree.

In addition to the financial support available through the departments in the form of fellowships, research assistantships, and teaching assistantships, there are externally administered fellowship programs for the support of graduate study in health-related fields. In particular, both the National Institutes of Health and the National Science Foundation offer such fellowships based on national competition.

MANUFACTURING

Programs in manufacturing are available at the undergraduate, master’s, and Ph.D. level. Master’s programs are offered by the departments of Civil and Environmental Engineering, Management Science and Engineering (MS&E), and Mechanical Engineering. The Manufacturing Systems Engineering program is jointly offered by MS&E and Mechanical Engineering. The M.B.A./Manufacturing Systems Engineering Dual Degree program is offered by the School of Engineering and Graduate School of Business in partnership. The Construction Engineering and Management program, offered by the Department of Civil and Environmental Engineering, is also a “manufacturing” program for students interested in facility and public works manufacturing. All of these programs take advantage of modern computer technology.

Doctrinal programs related to manufacturing are available in a number of departments and involve research projects ranging from machine tool design to the integration of databases into production software.

The Future Professors of Manufacturing (FPM) program prepares graduates for university faculty careers with an emphasis on manufacturing. Candidates are first admitted to a Ph.D. program in a department of the School of Engineering or the Graduate School of Business, and then interested students may be nominated for the FPM program by the department.

For detailed information about the master’s and Ph.D. programs, see the sections of this bulletin pertaining to industrial, mechanical, and civil and environmental engineering. For more information on the Manufacturing Systems Engineering program, contact the Design Division of Mechanical Engineering. For information on the M.B.A./Manufacturing Systems Engineering Dual Degree program and the FPM Ph.D. program, contact the Alliance for Innovative Manufacturing at Stanford (AIM). Inquiries by email may be addressed to sima-info@simas.stanford.edu. For more information on manufacturing research and education in Engineering, browse the AIM Web pages at http://www-sima.stanford.edu/ and the Web pages for departments.

CURRICULA

For further details about the following programs, see the department sections in this bulletin.

Related aspects of particular areas of graduate study are commonly covered in the offerings of several departments and divisions. Graduate students are encouraged, with the approval of their department advisers, to select courses in departments other than their own to achieve a broader appreciation of their field of study. For example, most departments in the school offer courses concerned with properties of materials, and a student interested in an aspect of materials engineering can often gain appreciable benefit from the related courses given by departments other than her or his own.

Departments and divisions of the school offer graduate curricula as follows.

AERONAUTICS AND ASTRONAUTICS

The current research and teaching activities cover a number of advanced fields, with special emphasis on:
- Active Noise Control
- Aerodynamic Noise
- Aeronautics
- Aircraft Design, Performance, and Control
- Applied Aerodynamics
- Biomedical Mechanics
- Computational Aero-Acoustics
- Computational Fluid Dynamics
- Control of Robots, including Space and Deep-Underwater Robots
- Conventional and Composite Structures/Materials
- Direct and Large Eddy Simulation of Turbulence
- High-Lift Aerodynamics
- Hypersonic and Supersonic Flow
- Inertial Instruments
- Multidisciplinary Design Optimization
- Navigation Systems (especially GPS)
- Optimal Control, Estimation, System Identification
- Physical Gas Dynamics
- Robust Control of Flexible Spacecraft
- Spacecraft Design and Satellite Engineering
- Shock Tube Studies of Vortex Interactions
- Turbulent Flow and Combustion
CHEMICAL ENGINEERING
Applied Statistical Mechanics
Biocatalysis
Biochemical Engineering and Biophysics
Computational Materials Science
Colloid Science
Dynamics of Complex Fluids
Hydrodynamic Stability
Kinetics and Catalysis
Newtonian and Non-Newtonian Fluid Mechanics
Polymer Physics
Protein Biotechnology
Semiconductor Processing
Surface and Interface Science

CIVIL AND ENVIRONMENTAL ENGINEERING
Construction Engineering and Management
Design/Construction Integration
Environmental and Water Studies
  Environmental Engineering and Science
  Environmental Fluid Mechanics and Hydrology
Structural Engineering and Geomechanics
  Geomechanics
  Structural Engineering

COMPUTER SCIENCE
Analysis of Algorithms
Artificial Intelligence
Automated Deduction
Autonomous Agents
Compilers
Complexity Theory
Computational Geometry
Computer Architecture
Computer Graphics
Computer Security
Computer Vision
Database Systems
Design Automation
Digital Libraries
Distributed and Parallel Computation
Formal Verification
Haptic Display of Virtual Environments
Human-Computer Interaction
Image Processing
Knowledge-Based and Expert Systems
Knowledge Representation and Logic
Mathematical Theory of Computation
Multi-Agent Systems
Networks, Internet Infrastructure, and Distributed Systems
Operating Systems
Programming Systems/Languages
Reasoning under Uncertainty
Robotics
Scientific Computing and Numerical Analysis
Software Engineering

ELECTRICAL ENGINEERING
Computer Hardware
Computer Software Systems
Control and Systems Engineering
Communication Systems
Electronic Circuits
Electronic Devices, Sensors, and Technology
Fields, Waves, and Radioscience
Lasers, Optoelectronics, and Quantum Electronics
Network Systems
Image Systems
Signal Processing
Solid State Materials and Devices
VLSI Design

ENGINEERING
Interdepartmental Programs
Interdisciplinary Programs

ENGINEERING IN BIOLOGY AND MEDICINE
Biostatistics
Design for Medical Applications
Information Processing in and for Biomedical Systems
Mechanics of Hearing
Medical Imaging
Neuromuscular Biomechanics
Orthopedic Biomechanics
Rehabilitation Engineering
Transport Phenomena in Biological Systems

MANAGEMENT SCIENCE AND ENGINEERING
Decision and Risk Analysis
Dynamic Systems
Economics
Entrepreneurship
Finance
Information
Marketing
Optimization
Organization Behavior
Organizational Science
Policy
Production
Stochastic Systems
Strategy

MATERIALS SCIENCE AND ENGINEERING
Biomaterials
Ceramics and Composites
Computational Materials Science
Design/Manufacturing
Electrical and Optical Behavior of Solids
Electron Microscopy
Fracture and Fatigue
Imperfections in Crystals
Kinetics
Magnetic Behavior of Solids
Magnetic Storage Materials
Phase Transformations
Physical Metallurgy
Solid State Chemistry
Structural Analysis
Thermodynamics
Thin Films
X-Ray Diffraction

MECHANICAL ENGINEERING
Biomechanics
Combustion Science
Computational Mechanics
Controls
Design of Mechanical Systems
Dynamics
Environmental Science
Experimental Stress and Analysis
Fatigue and Fracture Mechanics
Finite Element Analysis
Fluid Mechanics
Heat Transfer
The program of study must satisfy the student's department and usually receives letter grades, (3) the program must include a total of at least 45 units. Each student's program is administered by the particular department. (1) the student's program must be a coherent one with a well-defined objective and must be approved by a department within the school, (2) the student's program must be a coherent one with a well-defined objective and must be approved by a department within the school, (3) the program must include a total of at least 45 units. Each student's program is administered by the particular department in which it is lodged and must meet the standard of quality of that department.

Applications for admission should indicate the department in the school in which the student expects to take most of her or his courses. Transfer into this program is also possible from any program within the school by application to the appropriate department.

The degree of Engineer is awarded at the completion of a comprehensive two-year program of graduate study. It is intended for students who desire more graduate training than can be obtained in an M.S. program. The program of study must satisfy the student’s department and usually includes 90 units beyond the B.S. degree, of which at least 60 must be devoted to advanced or graduate study in the major subject or closely related subjects. The presentation of a thesis is required. The University regulations for the Engineer degree are stated in the “Graduate Degrees” section of this bulletin, and further information is found in the individual departmental sections of this bulletin.

Programs leading to the Ph.D. degree are offered in each of the departments of the school. Special Ph.D. programs, which may be interdepartmental in nature (for example, Bioengineering), can be arranged. University regulations for the Ph.D. are given in the “Graduate Degrees” section of this bulletin. Further information is found in departmental listings.

(WIM) indicates that the course meets the Writing in the Major requirements.
15. Dynamics—Application of Newton’s Laws to solve static and dynamic problems, particle and rigid body dynamics, freebody diagrams, writing equations of motion. 2-D and 3-D cases including gyroscopes, spacecraft, rotating machinery. Solution of equations of motion and dynamic response of simple mechanical systems. Problem sessions. Prerequisites: Mathematics 23 or 43, Physics 41. GER:2b (DR:6)
   5 units, Aut (Rock)
20. Introduction to Chemical Engineering—Overview of chemical engineering through discussion and engineering analysis of physical and chemical processes. Topics: overall staged separations, material and energy balances, concepts of rate processes, energy and mass transport, and kinetics of chemical reactions. Applications of these concepts to areas of current technological importance: biotechnology, production of chemicals, materials processing, and purification. Prerequisite: Chemistry 31. GER:2b (DR:6)
   3 units, Spr (Robertson)
25. Biotechnology—The interplay between applied recombinant DNA technologies and engineering principles in designing, developing, manufacturing, and formulating novel drugs for therapeutic purposes. Emphasis is on understanding the role of engineering in modern biotechnology. Case study perspective. A drug is identified and tracked from the initial phases of drug discovery, to sequencing, cloning, scale-up in cell culture, purification and separation, and formulation. Regulatory issues in manufacturing and in clinical trials. Project-oriented. Recommended: some prior exposure to chemistry and biology. GER:2b (DR:6)
   3 units, Aut (Robertson)
30. Engineering Thermodynamics—Introduction to the concepts of energy and entropy from elementary considerations of the microscopic nature of matter. Use of basic thermodynamic concepts in the solution of engineering problems. Methods and problems in the socially responsible economic generation and utilization of energy in central power stations, solar systems, gas turbine engines, refrigeration devices, automobile engines, etc. Prerequisites: Mathematics 19, 20, 21 or 41, 42, and Physics 41 or equivalent. GER:2b (DR:6)
   3 units, Aut (Mungal)
   Win (Edwards)
40. Introductory Electronics—Overview of electronic engineering. Electrical quantities, and their measurement, including the operation of the oscilloscope. The basic fuction of electronic components including ideal diodes and transistors. Digital logic circuits and their functions including the elementary microprocessor. Analog circuits including the operational amplifier and tuned circuits. Lab assignments complement lecture. Enrollment limited to 200. Lab. May be taken on video at some of Stanford’s Overseas Centers; see “Overseas Studies.” Corequisite: Physics 45. GER:2b (DR:6)
   5 units, Aut (Khuri-Yakub)
   Spr (Staff)
   4 units, Win (Bravman)
   Spr (Sinclair)
60. Engineering Economy—May be taken by freshmen, but recommended for second year or higher students Economic analysis for choice among alternatives. Use of compound interest calculations. Selection of appropriate minimum attractive rates of return. Effects of depreciation, sources of funds, and income tax. Analysis of decisions under uncertain-
   ty. Prerequisite: Mathematics 41 or equivalent. Recommended: previous knowledge of elementary probability.
   3 units, Aut (Jucker)
   Win, Sum (Staff)
62. Introduction to Optimization—Theory and computation of optimal selection of decisions under certainty. Linear programming, network optimization models, dynamic programming, non-linear programming, integer programming. Applications from a variety of areas, emphasizing high-level problems frequently faced by industrial engineers and management scientists. Prerequisite: Mathematics 43 or consent of instructor. GER:2b (DR:6)
   4 units, Aut (Staff)
   Spr (Zelenski)
63Q. Stanford Introductory Seminar: Engineering Applications in Medicine—Preference to sophomores. Introduction to the application of engineering to problems in medicine and health care. Topics: applications of engineering mathematics, systems analysis, and decision analysis to health policy problems; assessment of medical technologies; risk analysis and public policy; computer science applications in medicine; computer science applications in pharmacology; computer science applications in clinical trials. Project-oriented. Recommended: some prior exposure to engineering and medicine. GER:2b (DR:6)
   3 units (Brandeau, Owens)
70A. Programming Methodology—(Enroll in Computer Science 106A.)
   5 units, Aut (Plummer)
   Win (Staff)
   Spr (Roberts)
70X. Programming Methodology and Abstractions (Accelerated)—
   (Enroll in Computer Science 106X.)
   5 units, Aut (Staff)
   Win (Plummer)
   Spr (Zelenski)
100. Teaching Public Speaking—The theory and practice of teaching public speaking and presentation development. Lectures/discussions on developing an instructional plan, using audiovisual equipment for instruction, devising tutoring techniques, and teaching delivery, organization, audience analysis, visual aids, and unique speaking situations. Weekly practice speaking. Students serve as apprentice speech tutors. Those completing course may become paid speech instructors in the Technical Communications Program. Prerequisite: consent of instructor ...
   5 units, Aut, Win, Spr (Lougee, Staff)
102E. Technical/Professional Writing for Electrical Engineers—
   Required of Electrical Engineering majors. The process of writing technical/professional documents. Lecture, writing assignments, individual conferences. Prerequisite: Freshman English. Corequisite: Electrical Engineering 121. (WIM)
   1 unit, Aut, Spr (Lougee)
102M. Technical/Professional Writing for Mechanical Engineers—
   Required of Mechanical Engineering majors. The process of writing technical/professional documents. Lecture, writing assignments, individual conferences. Pre- or corequisite: Mechanical Engineering 103, or consent of instructor. (WIM)
   1 unit, Aut, Win (Lougee)
102S. Writing: Special Projects—Structured writing instruction for students working on non-course related materials (theses, dissertations, journal articles). Weekly individual conferences.
   1-5 units, Aut, Win, Spr (Staff)
102W. Technical and Professional Writing—Explores, systematically, the process of writing technical and professional documents. Lectures/discussions on analyzing audiences; defining purpose; generating and selecting appropriate report materials; structuring and designing clear and convincing reports; drafting effective reports; and editing reports that are clear, concise, emphatic, and mechanically and grammatically “clean.” Weekly writing assignments and individual conferences. Enrollment limited.
3 units, Aut, Win, Spr (Loungee)

103. Public Speaking/Presentation Development—Priority given to Engineering students. Introduction to the full range of speaking activities, from impromptu talks to carefully rehearsed formal professional presentations. How to organize and write speeches for a variety of occasions, analyze audiences, create-and use appropriate visual aids, combat nervousness, and deliver informative and persuasive speeches effectively. Students become confident speakers through weekly practice in class, rehearsals in one-on-one tutorials, and videotaped feedback.
3 units, Aut, Win, Spr (Staff)

3-4 units (Staff) not given 2000-01

3 units, Aut (Enge)
Win (Franklin)

3 units, Aut (Horne)

130. Science, Technology, and Contemporary Society—(Same as Science, Technology, and Society 101.) Analysis of the interplay of science, technology, and society in the contemporary U.S. Topics: the key social, cultural, and values issues raised by contemporary scientific and technological developments; distinctive features of science and engineering as socio-technical activities; major influences of scientific and technological developments on 20th-century society, including transformations and problems of work, leisure, human values, the fine arts, and international relations; ethical conflicts in scientific and engineering practice; and the social shaping and management of contemporary science and technology. Optional section for extra unit. GER:3b (DR:9)
4-5 units, Aut (McGinn)

131. Ethical Issues in Engineering—(Same as Science, Technology, and Society 115.) Ethical issues in contemporary engineering practice. Topics: the moral rights and responsibilities of engineers in relation to society, employers, colleagues, and clients; cost-benefit-risk analysis, safety, and informed consent; the ethics of whistle blowing; ethical conflicts of engineers as expert witnesses, consultants, and managers; ethical issues in engineering design, manufacturing, and operations; ethical issues arising from engineering work in foreign countries; and ethical implications of the social and environmental contexts of contemporary engineering. Use of real-life case studies, guest practitioners, and field research. Limited enrollment. GER:3a (DR:8)
4 units, Spr (McGinn)

140A. Management of Technology Ventures—First of three-credit only for students selected to the Mayfield Fellows Program. Functional management and leadership within high technology startups, focusing on entrepreneurial skills related to product and market strategy, venture financing and cash flow management, team recruiting and building strategies, and the challenges of managing growth and handling adversity in emerging ventures. Other engineering faculty, start-up founders, and venture capitalists participate as appropriate. No auditors. Recommended: accounting or finance course (Management Science and Engineering 133, Economics 90, or Engineering 60).
4 units, Spr (Byers)

140B. Management of Technology Ventures—Open to Mayfield Fellows only; taken during the summer work tour at a technology startup. Students meet to exchange experiences and continue the formal learning process, and keep a journal of activities. Credit given following quarter. No auditors.
1 unit, Aut (Byers)

140C. Management of Technology Ventures—Open to Mayfield Fellows only. Allows students, faculty, employers, and venture capitalists to share and compare recent co-op experiences and analytical frameworks. Students develop “living” case studies and integrative project reports. No auditors.
3 units, Aut (Sutton)

145. Introduction to High Technology Entrepreneurship—Primarily for undergraduates in engineering; preference to seniors. High-level overview of the entrepreneurial process, enterprise, and individual. For those who would like to form or grow a technology company, and those with a general interest in the field. Weekly assignments, case studies, lectures, and projects. No auditors.
3 units, Win (Byers)

4 units, Aut (Squires)
Spr (Feziger)

4 units, Win (Moin)

159Q. Stanford Introductory Seminar: Research in Japanese Companies—Preference to sophomores. The home-campus equivalent of the Kyoto course. Knowledge from this research, and company visits, is
evaluated in a seminar/discussion setting. Lecture/discussion on the structure of a Japanese company from the point-of-view of Japanese society. Visiting researchers from Japanese companies, with brief presentations and extensive question and answer periods, explore the Japanese research ethic.

3 units, Spr (Sinclair)

199. Special Studies in Engineering—Special studies, lab work, or reading under the direction of a faculty member. Often research opportunities exist in ongoing research projects. Students make arrangements with individual faculty and enroll in the section number corresponding to the particular faculty member. Prerequisite: consent of instructor.

1 or more units, any quarter (Staff)

PRIMARILY FOR GRADUATE STUDENTS

205. Introduction to Control Design Techniques—Review of root-locus and frequency response techniques for control system and analysis, and synthesis. Introduction to: digital control design and the z-transform; state-space techniques modeling, full-state feedback regulator design, pole placement, and observer design. Combined observer and regulator design. Lab experiments on computers connected to mechanical systems. Prerequisites: 105; Mathematics 103, 113. Recommended: knowledge of Matlab.

3 units, Aut (Tomlin)

206. Control System Design and Simulation—Sequel to 105. Analog op-amp circuits are used for simulation and control law implementation. Design of differential actuators and sensors. Model construction techniques. Teams design, build, and test a miniature control system. Emphasis is on qualitative aspects of synthesis, generation of candidate design, and engineering tradeoffs in system selection. Lab. Prerequisite: 105.

4 units, Win (Rock)

207A. Modern Control Design I—Design and analysis of digital controllers using classical and state space techniques. Discretization of continuous systems, z-transforms, and direct digital design. Pole placement and optimal quadratic regulators for single-input/single-output and multiple-input/multiple-output discrete systems. Discrete observers and optimal estimators. Simple lab experiments on mechanical systems. Prerequisites: 205; Mathematics 103 or Mechanical Engineering 200A.

3 units, Win (Lall)

207B. Modern Control Design II—Design of optimal controllers and estimators for systems with stochastic disturbances. Basic probability theory, identification techniques, recursive filtering, duality, and properties of optimal regulators. Sensitivity, robustness, and design trade-offs. Extensions to other cost functions. Lab experiments on computers connected to mechanical systems. Prerequisite: 207A. Recommended: Electrical Engineering 278 or Statistics 116.

3 units, Spr (Tomlin)


3 units, Tomlin

209B. Advanced Nonlinear Control—Second of series in nonlinear systems. Introduction to differential geometry. Input/output analysis and stability: small gain theorems, passivity theorems, Lure problem. Popov and circle criteria. Geometric nonlinear control. MIMO feedback linearization; backstepping. Design examples from a variety of areas. Prerequisite: 209A.

3 units, Spr (Tomlin)


3 units (Staff) not given 2000-01


3 units (Staff) not given 2000-01


220A. 3 units, Aut (J. Levandosky)
220B. 3 units, Win (J. Levandosky)
220C. 3 units, Spr (Mattingly)

235A,B. Space Systems Engineering—40-50 students, mostly from engineering and science, but also from business and political science, form a team to prepare a preliminary design study of a space system. Recently, international engineers have joined the team to define an initiative to put humans on Mars by 2010. Continued studies with Japan, Russia, and Europe define space vehicles for the missions. About 20 invited speakers from government and industry give the necessary background information. At the end of the second quarter, the class gives a verbal briefing to government and industry representatives and publishes a final report on the system. Prerequisite: senior or graduate standing in Engineering or Physics, or consent of instructor.

235A, 3 units, Win (Lusignan)
235B. 3 units, Spr (Lusignan)

251. Research Writing and Review—Seminar. Students participate in the Creating Research Examples Across the Teaching Enterprise (CREATE) writing program. The goal is to have students produce, through a peer reviewed process, 1,000 word statements describing their research in ways that are understandable and compelling to undergraduates and other novices in the field. Unit credit when the final approved statements appear on the CREATE web site.

1 unit, Win, Spr (Reis)

290. Graduate Environment of Support: Tutorial and Learning Strategies—Discussion by guest faculty, advanced graduate students, specialists from industry and government, and the dean’s office. Topics and information are related to adapting graduate study to the environment in terms of psychosocial, financial, and career issues. How these relate to diversity, affirmative action and minority services, resources, policies, and procedures. Readings and observation participation sessions. (AU)

1 unit, Aut, Win, Spr (Reis)

297A,B,C. Ethics of Development in a Global Environment (EDGE)—(Same as Cultural and Social Anthropology 133A,B,C.) Wednesday evening seminars on world affairs mostly on issues affecting poor nations. Autumn Quarter treats war and peace: the background of current wars and peace negotiations, the UN peacekeeping efforts, war and religion, arms trade. Winter Quarter treats international resources and commerce: the debt crisis, environmental protection, resource depletion, Japan in the world economy, aid and monetary institutions. Spring Quarter treats “poverty and prejudice”: development models, comparative national health, AIDS, control of wealth, India-China-Africa-S. America today. Speakers from Stanford and other institutions are experts
298. Seminar in Fluid Mechanics—Interdepartmental seminar on problems in all branches of fluid mechanics, with talks by visitors, faculty, and students. Graduate students may register for 1 unit, without letter grade; a letter grade is given for talks. (AU)

1 unit, Aut (Shaafeh)
Win (Moin)
Spr (Durbin)

299. Special Studies in Engineering—Special studies, lab work, or reading under the direction of a faculty member. Students enroll in the section number corresponding to the particular faculty member. Prerequisite: consent of the instructor.

1 or more units, any quarter (Staff)

310A. Tools for Team-Based Design—(Same as Mechanical Engineering 310A.) For graduate students; open to limited SITN/global enrollment. Project-based, exposing students to the tools and methodologies useful for forming and managing an effective engineering design team in a business environment, including product development teams that may be spread around the world. Topics: personality profiles for creating teams with balanced diversity; computational tools for project coordination and management; real time electronic documentation as a critical design process variable; and methods for refining project requirements to ensure that the team addresses the right problem with the right solution. Computer-aided tools are employed for supporting geographically distributed teams. The final project analyzes a set of industry-sponsored design projects for consideration in 310B,C. The investigation includes benchmarking and meetings with industrial clients. The deliverable is a detailed document with specifications for the project and the optimal design team that should work on the project in subsequent quarters. Limited enrollment, consent of instructor for off-campus (global) registrants.

4 units, Aut (Cutkosky)

310B,C. Design Project Experience with Corporate Partners—(Same as Mechanical Engineering 310B,C.) Two-quarter project for graduate students who already have some design experience and want in-depth involvement in an entrepreneurial design team with real world industrial partners. The products developed are part of the student’s portfolio. For some projects, 217 and 218 may be prerequisites or co-requisites (see http://me310.stanford.edu for admission guidelines). Each team functions like a small start-up company, working closely with a technical advisory board, consisting of the instructional staff and a coach. Teams use computer-aided tools for project management, communication, and documentation, and are provided a budget for direct expenses including hiring technical assistants and conducting tests. Teams interact with corporate liaisons weekly via site visits, video conferencing, email, fax, and phone. Hardware demonstrations, peer reviews, scheduled documentation releases, and an intense team environment provide the mechanisms and culture for design information sharing. Enrollment by consent of instructor and depends on the results of a pre-enrollment survey in December and the recommendations made by project definition teams in 310A.

4-5 units Win, Spr (Cutkosky)

610. Manufacturing Systems Analysis—(Same as Business T610.) Causal models of material flow in manufacturing systems. Topics: capacity and capacity utilization; functions of inventory; the manufacturing enterprise as a linear economic system; product structure and requirements planning; models of manufacturing response time; product portfolios and manufacturing flexibility. Emphasis is on descriptive modeling.

4 units (Harrison)

611. Understanding Manufacturing Processes—(Same as Business T611.) Provides a framework for understanding the technology of modern manufacturing processes, focusing on the key factors in developing an understanding of any manufacturing process. Topics include underlying microscopic physical and analytical theories; steps that control the performance, quality, and cost of the product; the history of the process; and the potential for improvement through research. Examples of fabrication processes (e.g., semiconductor devices, precision machining).

4 units (Cutkosky, Wood)

612. Manufacturing Organization—(Same as Business T612.) Overview of organization theory, research, and research methods relevant to the study of manufacturing systems. Conceptual domains include selection, socialization, promotion systems, reward systems, job design, creativity, innovation, social networks, group problem-solving, and the relationship between technology and social structure. Research focuses on papers that used organizational theory and methods to understand behavior of, and in, manufacturing settings.

4 units (Staff) given 2001-02

613. Design for Manufacturability—(Same as Business T613.) Structured methodologies of the DFM process, emphasizing the pivotal role of design in manufacturing effectiveness. Topics: the initial stages of the concurrent engineering process including functional analysis, benchmarking, quality function deployment, value analysis, cost drivers, design for assembly and serviceability, design for process, and advanced research issues on these topics. Projects involve independent study of the design and manufacture of a product currently in production leading to a new product definition offering improved competitive advantage.

4 units (Ishii)

614. Manufacturing Performance Measurement—(Same as Business T614.) Managerial accounting as a discipline is devoted to modeling manufacturing processes and representing physical events in economic terms: fundamental issues in measurement theory, cost-volume-profit analysis, activity-based costing, variance analysis, and the costs and benefits of flexibility. Finance functions: capital investment in technology, interactions with the financial markets, capital structure, and taxation. Quality, where modeling of economic effects is a relatively recent phenomenon: statistical process control, cost of quality measures, ISO 9000, the Baldrige Award process, and environmental protection.

4 units (Patelli)

615. Manufacturing Information and Coordination—(Same as Business T615.) Systems for sharing information, coordinating activities, and aligning different objectives in a manufacturing organization. Cross-functional coordination, goal conflicts among agents, design of incentives, resource allocation. The information systems that support coordination activities through a value delivery chain (systems for order entry, master scheduling, requirements planning, product scheduling, and material flow control).

4 units (Whang)

616. Proseminar in Manufacturing Education—(Same as Business T616.) Primarily for the Future Professors of Manufacturing, but open to others with consent of the instructor. Students are exposed to manufacturing topics not covered in traditional courses and which are needed to help them prepare for academic careers in manufacturing. Topics are chosen by the students, who develop many of the presentations and lead many of the discussions. Guest speakers from government, industry, and academia.

1 unit, Aut, Win, Spr (Reis)

OVERSEAS STUDIES

These courses are approved for the School of Engineering and taught overseas at the campus indicated. Students should discuss with their major department adviser which courses would best meet individual needs. Descriptions are in the “Overseas Studies” section of this bulletin or at
the Overseas Studies office, 126 Sweet Hall. Students overseas are also encouraged to participate in an internship as part of their international experience.

BERLIN

40B. Introductory Electronics
5 units, Aut, Win, Spr (Masters)

50B. Introductory Science of Materials
4 units, Aut, Win, Spr (Bravman)

FLORENCE

50F. Introductory Science of Materials
4 units, Aut, Win (Bravman)

KYOTO

40K. Introductory Electronics
5 units, Spr (Masters)

50K. Introductory Science of Materials
4 units, Spr (Bravman)

PARIS

40P. Introductory Electronics
4 units, Aut, Win (Bravman)

50P. Introductory Science of Materials
4 units, Aut, Win (Bravman)

AERONAUTICS AND ASTRONAUTICS

Chair: George S. Springer
Associate Chair: Brian J. Cantwell
Professors: Brian J. Cantwell, Fu-Kuo Chang, Antony Jameson, Ilan Kroo, Robert W. MacCormack, Bradford W. Parkinson, George S. Springer, Charles R. Steele
Associate Professors: Per Enge, Sanjiva Lele, Stephen Rock
Assistant Professors: Juan Alonso, Sanjay Lall, Claire Tomlin
Professors (Research): Richard Christensen, Stephen W. Tsai
Lecturer: Thomas H. Pulliam
Consulting Professors: Ronald K. Hanson, Lambertus Hesselink
Consulting Professors: David Altman, Cynthia H. Null, Bernard Ross, Robert Twigg
Consulting Associate Professor: Jonathan How

The current research and teaching activities cover a number of advanced fields, with special emphasis on:
Active Noise Control
Aerodynamic Noise
Aeroelasticity
Aircraft Design, Performance, and Control
Applied Aerodynamics
Biomedical Mechanics
Computational Aero-Acoustics
Computational Fluid Dynamics
Control of Robots, including Space and Deep-Underwater Robots
Conventional and Composite Materials and Structures
Direct and Large-Eddy Simulation of Turbulence
High-Lift Aerodynamics
Hypersonic and Supersonic Flow
Inertial Instruments
Multidisciplinary Design Optimization
Navigation Systems (especially GPS)
Optical Diagnostics in Fluid Dynamics
Optimal Control, Estimation, System Identification
Physical Gas Dynamics
Robust Control of Flexible Spacecraft
Shock Tube Studies of Vortex Interactions
Spacecraft Design and Satellite Engineering
Turbulent Flow and Combustion

INSTRUCTION AND RESEARCH FACILITIES

The work of the department is centered in the William F. Durand Building for Space Engineering and Science. This 120,000 square foot building houses advanced research and teaching facilities and concentrates in one complex the Department of Aeronautics and Astronautics as well as the activities of other engineering organizations allied in space exploration and aerospace technology.

The Global Positioning System (GPS) Laboratory is engaged in research on precise aircraft, spacecraft, and ground vehicle navigation. The laboratory has extensive equipment including approximately 30 carrier phase receivers and has built approximately 20 pseudolites for centimeter level positioning research both inside and outside buildings. A nationwide network of reference stations has been installed for evaluation of the Wide Area Differential GPS concept. The laboratory has performed extensive flight testing in a twin engine aircraft at local airports.

The Aerospace Robotics Laboratory (ARL) is developing advanced robot systems and control techniques applicable to industrial automation and space and underwater robotics. Experimental research facilities include very-flexible-beam manipulators, SCARA-configured manipulators with flexible drive trains, quick mini-manipulators, and pairs of cooperating manipulators. A collection of model free-flying space robots that experience the dynamics of space through the use of air-cushion support systems makes possible leading-edge research in space-manipulator system dynamics. Object-based control puts the human operator at the task command level. ARL works closely with the Computer Science Robotics Laboratory on task-planning/task-execution systems and with the GPS Laboratory on the navigation and control of autonomous systems.

The ARL computing facilities include a dozen Sun workstations for control system design, analysis, and simulation; for real-time software development; for mechanical and electrical CAD; and for documentation. The workstations are complemented by a collection of real-time control computers networked by the labwide LAN. These microprocessor-based, single-board computers are used in multiprocessor configurations for implementing and testing control algorithms on experimental hardware.

The Guidance and Control Laboratories include a wide spectrum of specialized facilities for making and testing novel instruments of extremely high precision. In addition, students work in laboratories associated with interdepartmental science experiments such as Gravity Probe-B (a gyro test of general relativity), a Space Test of the Equivalence Princi-
ple, and an advanced Laser Interferometer Gravity-wave Observatory. Clean facilities, ultra-precision machining, and advanced electronics design and fabrication support the guidance, control, and instrumentation experiments and research in precision machining; for example, quiet hydraulics for actuation and metrology on machines expected to operate with 30 nm precision. Cryogenic gyro test facilities are available in the nearby Varian Physics Building, and Electrical Engineering’s Integrated Circuit Fabrication Facility is adjacent.

The spacecraft design program is a total life-cycle space mission program. The Satellite Systems Development Laboratory (SSDL) provides the opportunity for building, testing, and operating low earth-orbiting microsatellites. Students at the master’s degree level participate in mission planning, project management, spacecraft design, fabrication, testing, launch integration, and mission operations. Students in the engineer and doctoral programs are involved with multiyear satellite programs for more complex missions. These programs involve direct interaction with payload customers and industry in both design and operations.

The Aircraft Aerodynamics and Design Group is involved with research in applied aerodynamics and aircraft design. Their work ranges from the development of computational and experimental methods for aerodynamic analysis to studies of unconventional aircraft concepts and new architectures for multidisciplinary design optimization.

The Flow Physics and Computation Division (FFC) is a joint laboratory between the departments of Aeronautics and Astronautics, and Mechanical Engineering. The FFC offers courses in aerodynamics, applied mathematics, compressible flow, computational fluid mechanics, numerical analysis, and propulsion.

The goal of the FFC is to carry out basic research leading to the development of improved computational tools and physical models for accurate engineering design, analysis, and control of complex flows. Problems of interest include aerodynamics, electronic cooling, material processing, planetary entry, power systems, propulsion, and semiconductor manufacturing. Research is conducted in a variety of disciplines including acoustics, chemical reactions, combustion, data display, environmental fluid mechanics, flow control, flow interactions with electromagnetic waves, numerical analysis, plasmas and processing, and scientific computing.

The computational facilities of the FFC include powerful workstations, color displays and reproduction facilities, and direct access to the major national computing facilities of the nearby NASA-Ames Research Center which includes CRAY-C90s and massively parallel supercomputers. The Center for Turbulence Research (CTR), a research consortium between Stanford and NASA, is affiliated with this group. The intellectual atmosphere of the Flow Physics and Computation Division is greatly enhanced from interactions with CTR’s large staff of postdoctoral researchers and distinguished visiting scientists.

Experimental fluid mechanics research is carried out using the facilities of the Aero-Fluid Mechanics Laboratories (AFML). Facilities include several laser sources and flow measuring systems; a high pressure shock tube; a flow visualization water channel; and a temperature stabilized subsonic wind tunnel equipped with a unique free-to-roll, free-to-yaw high angle-of-attack model support system. Collaborative projects with NASA-Ames provide Stanford faculty and graduate students access to a variety of large-scale experimental flow facilities. Research is directed at using experimentation to enhance a basic understanding of fluid flow phenomena with application to aeronautical systems including the aerodynamics of high lift systems, new propulsion concepts, and advanced aerodynamic measurement techniques.

The Structures and Composites Laboratories include facilities for studying and testing the behavior of small-scale structures of metal and fiber reinforced composites. Equipment is also available to fabricate structural elements made of composite material using an autoclave, resin transfer molding, and hot press.

The department has over 100 computers in the Durand Building for use in the academic and research programs. Two clusters of Macintoshes and PCs are available for student use, and each research group is equipped with advanced workstations, Macintoshes, and/or PCs. In addition, computer clusters throughout the campus provide access to electronic mail, the WorldWide Web, and time-shared computation via the campus academic computer network. They are available to all students at no cost for their course work or unsponsored research.

The Durand Building also houses faculty and staff offices and several conference rooms. Attached to the building is a modern classroom building equipped for televising lectures; it contains a lecture auditorium.

The Center for Turbulence Research (CTR) is a research consortium for fundamental study of turbulent flows, jointly operated by Stanford and NASA-Ames Research Center. Its principal objective is to stimulate significant advances in the physical understanding of turbulence, leading to improved capabilities for control of turbulence and turbulence modeling for engineering analysis. Emphasis is placed on probing turbulent flow fields, developed by direct numerical simulations and/or laboratory experiments using new diagnostic techniques and mathematical methods, and on concepts for turbulence control and modeling. Although the role of the CTR is to advance the understanding of turbulent flows for aerospace applications, it is an interdisciplinary program; researchers with interest in turbulence are sought from aeronautics, mathematics, meteorology, oceanography, physics, and other areas.

GENERAL INFORMATION

Further information about the facilities and programs of the Department of Aeronautics and Astronautics is available on the World Wide Web (at http://aa.stanford.edu/) or by request from the department’s Student Services office.

The department has a very active student branch of the American Institute of Aeronautics and Astronautics, which sponsors films covering aerospace topics and monthly socials. It also conducts visits to nearby research, government, and industrial facilities, and sponsors a Young Astronauts Program in the local schools.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

Although primarily a graduate-level department, Aeronautics and Astronautics offers an interdisciplinary program in Aeronautics and Astronautics (AA) leading to the B.S. degree in Engineering. For further information, see the “School of Engineering” section of this bulletin and the Undergraduate Handbook, available from the Office of the Dean of Engineering.

Undergraduates interested in aerospace may also elect a minor in Aeronautics and Astronautics. For information about an AA undergraduate minor, see the “School of Engineering” section of this bulletin.

COTERMINAL PROGRAM

This special program allows Stanford undergraduates an opportunity to work simultaneously toward a B.S. in another field and an M.S. in Aeronautics and Astronautics. General requirements for this program and admissions procedures are described in the “School of Engineering” section of this bulletin. Admission is granted or denied through the departmental faculty Admissions and Awards Committee. A coterminal
student must meet the course and scholarship requirements detailed for the M.S. below.

GRADUATE PROGRAMS

Admission—To be eligible to apply for admission to the department, a student must have a bachelor’s degree in engineering, physical science, mathematics, or an acceptable equivalent. Students who have not yet received a master’s degree in a closely allied discipline will be admitted to the master’s program; eligibility for the Ph.D. program is considered after the master’s year (see “Doctor of Philosophy” below). Applications for all degree programs are accepted throughout the year, although applications for fellowship aid must be received and completed by January 15 for the next Autumn Quarter.

Information about admission to the Honors Cooperative Program is included in the “School of Engineering” section of this bulletin.

Further information and application forms may be obtained from Graduate Admissions, the Registrar’s Office (http://www.stanford.edu/ dept/registrar/admissions/).

Waivers and Transfer Credits—Students may receive departmental waivers of required courses for the M.S. degree in Aeronautics and Astronautics by virtue of substantially equivalent and satisfactorily performed course work at other institutions. A waiver petition (signed by the course instructor and adviser) should be submitted to the Student Services office indicating (1) the Stanford University course number and title, and (2) the institution, number(s), and title(s) of the course(s) wherein substantially equivalent material was treated. If a waiver is granted, the student may take an additional technical elective in place of the required course. The total 45-unit requirement for the master’s degree is not reduced by course waivers.

A similar procedure should be followed for transfer credits. However, transfer credit is allowed only for courses taken as a graduate student, after receiving a bachelor’s degree, in which equivalence to Stanford courses is established and for which a grade of ‘B’ or better has been awarded. Transfer credits, if approved, will reduce the total number of Stanford units required for a degree. The number of transfer credits accepted for each degree (M.S., Engineer, and Ph.D.) is delineated in the “Graduate Degrees” section of this bulletin.

Fellowships and Assistantships—Fellowships and course or research assistantships are available to qualified graduate students. Fellowships sponsored by Gift Funds, Stanford University, and Industrial Affiliates of Stanford University in Aeronautics and Astronautics provide grants to several first-year students for the nine-month academic year to cover tuition and living expenses. Stanford Graduate Fellowships, sponsored by the University, provide grants for three full years of study and research; each year, the department is invited to nominate several outstanding doctoral or predoctoral students for these prestigious awards. Students who have excelled in their master’s-level course work are eligible for course assistantships in the department; those who have demonstrated research capability are eligible for research assistantships from individual faculty members. A half-time course or research assistantship provides a semi-monthly salary and a 9-unit tuition grant per quarter. Research assistants may be given the opportunity of full-time summer employment at twice the half-time rate. They may use their work as the basis for a dissertation or Engineer’s thesis.

MASTER OF SCIENCE

The University’s basic requirements for the master’s degree are outlined in the “Graduate Degrees” section of this bulletin. Students with an aeronautical engineering background should be able to qualify for the master’s degree in three quarters of work at Stanford. Students with a bachelor’s degree in physical science, mathematics, or other areas of engineering may find it necessary to take certain prerequisite courses, which would lengthen the time required to obtain the master’s degree. The following are departmental requirements.

SCHOLARSHIP REQUIREMENTS

A minimum grade point average (GPA) of 2.75 is required to fulfill the department’s M.S. degree requirements and a 3.0 is the minimum required for eligibility to attempt the Ph.D. qualifying examination. It is incumbent upon both M.S. and potential Ph.D. candidates to request letter grades in all courses except those that do not offer a letter grade option and those that fall into the categories of colloquia and seminars (for example, AA 293, 297, and 298). Insufficient grade points on which to base the GPA may delay expected degree conferral or result in refusal of permission to take the qualifying examinations. Candidates with GPAs of 3.0 through 3.2 must request the permission of the Candidacy Committee to attempt the qualifying examinations.

AERONAUTICS AND ASTRONAUTICS

The master’s program in Aeronautics and Astronautics (AA) is designed to provide a solid grounding in the basic disciplines and a foundation for systems engineering. All candidates for this degree are expected to meet the basic course requirements in experimentation in aeronautics and astronautics, fluid mechanics, guidance and control, propulsion, and structural mechanics (Category A below), in addition to work in applied mathematics (Category B) and technical electives (Category C).

A. Basic Courses—Candidates select eight courses as follows:

1. Five courses in the basic areas of Aeronautics and Astronautics (one each):
   a) Experimentation: 236A or 290; or Engr. 205, 206, or 207A
   b) Fluids: one of 200A, 200B, 210A
   c) Guidance and Control: Engr. 279
   d) Propulsion: 280 or 283
   e) Structures: 240A

2. Three courses, one each from the areas below:
   a) Fluids: 200A or 200B (if 210A was taken or waived in item 1);
     or 210A (if 200A or 200B was taken or waived in item 1)
   b) Structures: 240B or 256
   c) Guidance and Control: 271A or 279
   d) Aero Astro elective: AA course numbered 200 and above, excluding seminars and independent research.

Candidates who believe they have satisfied a Basic Courses requirement in previous study may request a waiver of one or more courses (see “Waivers and Transfer Credits” above). If a requirement in fluids, guidance and control, or structures in item 1 is waived, it is expected that a course in the same category from item 2 will be substituted.

B. Mathematics Courses—During graduate study, each candidate is expected to develop a competence in the applied mathematics pertinent to his or her major field. This requirement can be met by matriculating in a minimum of 6 units in either (1) applied mathematics (for example, complex variables, linear algebra, partial differential equations, probability), or (2) technical electives that strongly emphasize applied mathematics. A list of courses approved for the mathematics requirement is available in the departmental Student Services office. (Calculus, ordinary differential equations, and vector analysis are fundamental mathematics prerequisites, and will not satisfy the master’s mathematics requirement.) Students planning to continue to the Ph.D. should note that 25 percent of the major-field Ph.D. qualifying examination is devoted to pertinent mathematics.

C. Technical Electives—Candidates, in consultation with their advisors, select at least four courses in their major field from among the graduate-level courses offered by the departments of the School of Engineering and related science departments. This requirement increases by one course, taken in either the major or peripheral fields, for each basic course that is waived. Normally, one course (3 units) in this category may be directed research. Courses taken in satisfaction of the other master’s requirements (categories A, B, and D) may not also be counted as technical electives.

D. Other Electives—It is recommended that all candidates enroll in at least one humanities or social science course. Language classes qual-
ify in this category, but practicing courses in, for example, art, music, and physical education do not qualify.

When planning their programs, candidates should check course descriptions carefully to ensure that all prerequisites have been satisfied. A course that is taken to satisfy a prerequisite for courses in Category A (Basic Courses) or B (Mathematics) cannot be counted as a technical elective, but can count toward the M.S. degree in Category D (Other Electives).

ENGINEERING

Students whose career objectives require a more interdepartmental or narrowly focused program than is possible in the M.S. program in Aeronautics and Astronautics (AA) may pursue a program for an M.S. degree in Engineering (45 quarter units). This program is described in the School of Engineering "Graduate Programs of Study" section of this bulletin.

Sponsorship by the Department of Aeronautics and Astronautics in this more general program requires that the student file a proposal before completing 18 units of the proposed graduate program. The proposal must be accompanied by a statement explaining the objectives of the program and how the program is coherent, contains depth, and fulfills a well-defined career objective. The proposed program must include at least 12 units of graduate-level work in the department and meet rigorous standards of technical breadth and depth comparable to the regular AA Master of Science program. The grade and unit requirements are the same as for the M.S. degree in Aeronautics and Astronautics.

ENGINEER

The degree of Engineer represents an additional year (or more) of study beyond the M.S. degree and includes a research thesis. The program is designed for students who wish to do professional engineering work upon graduation and who want to engage in more specialized study than is afforded by the master's degree alone. It is expected that fulltime students will be able to complete the degree within two years of study after the master's degree.

The University’s basic requirements for the degree of Engineer are outlined in the “Graduate Degrees” section of this bulletin. The following are department requirements. The candidate’s prior study program should have fulfilled the department’s requirements for the master’s degree or a substantial equivalent. Beyond the master’s degree, a total of 45 units of work is required, including a thesis and a minimum of 30 units of courses chosen as follows:

1. Twenty-four units of approved electives, of which 9 shall be in mathematics or applied mathematics. The remaining 15 units shall be chosen in consultation with the adviser, and represent a coherent field of study related to the thesis topic. Suggested fields include: (a) acoustics, (b) aerospace structures, (c) aerospace systems synthesis and design, (d) analytical and experimental methods in solid and fluid mechanics, (e) computational fluid dynamics, and (f) guidance and control.

2. Six units of free electives.

3. The remaining 15 units may be thesis, research, technical courses, or free electives.

Candidates for the degree of Engineer are expected to have a minimum grade point average (GPA) of 3.0 for work in courses beyond those required for the master’s degree. All courses except seminars and directed research should be taken for a grade.

DOCTOR OF PHILOSOPHY

The University’s basic requirements for the Ph.D. degree are outlined in the “Graduate Degrees” section of this bulletin. Department requirements are stated below.

Qualifications for candidacy for the doctoral degree are contingent on:

1. Fulfilling department requirements for the master’s degree or its substantial equivalent.

2. Maintaining a high scholastic record for graduate course work at Stanford.

3. Completing 3 units of a directed research problem (AA 290 or an approved alternative).

4. In the first year of doctoral study, passing an oral Ph.D. qualifying examination given by the department during Autumn and Spring quarters.

Detailed information about the nature and scope of the Ph.D. qualifying examination can be obtained from the department. Research on the doctoral dissertation may not be formally started before passing this examination.

Beyond the master’s degree, a total of 90 additional units of work is required, including a minimum of 36 units of approved formal course work (excluding research, directed study, and seminars). The courses should consist primarily of graduate courses in engineering and related sciences, and should form a strong and coherent doctoral program. At least 12 units must be from graduate-level courses in mathematics or applied mathematics (a list of approved courses is available from the department Student Services office). University requirements for continuous registration do apply to doctoral students for the duration of the degree, including registration for each quarter in which the student requires department consultation to complete dissertation work.

University Oral and Dissertation—The Ph.D. candidate is required to take the University oral examination after the dissertation is substantially completed (with the dissertation draft in writing), but before final approval. The examination consists of a public presentation of dissertation research, followed by substantive private questioning on the dissertation and related fields by the University oral committee (four selected faculty members, plus a chair from another department). The University oral normally occurs toward the end of the fourth doctoral year. Once the oral has been passed, the student finalizes the dissertation for reading committee review and final approval. The dissertation reading committee is selected, in consultation with the adviser and subject to the approval of the department chair, during the second year of doctoral study. Forms for the University oral scheduling and a one-page dissertation abstract should be submitted to the department Student Services office at least three weeks prior to the date of the oral for departmental review and approval.

Ph.D. Minor

A student who wishes to obtain a Ph.D. minor in Aeronautics and Astronautics should consult the department office for designation of a minor adviser. A minor in Aeronautics and Astronautics may be obtained by completing 20 units of graduate-level courses in the Department of Aeronautics and Astronautics, following a program (and performance) approved by the department’s candidacy chair.

The student’s Ph.D. reading committee and University oral committee must each include at least one faculty member from Aeronautics and Astronautics.

COURSES

(WIM) indicates that the course meets the undergraduate Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations for undergraduates (8 units maximum).

100. Introduction to Aeronautics and Astronautics—The principles of fluid flow, flight, and propulsion; the creation of lift and drag, aerodynamic performance including take-off, climb, range, and landing performance, structural concepts, propulsion systems, trajectories, and orbits. Remarks on the history of aeronautics and astronautics. Prerequisites: Mathematics 41, 42; elementary physics.

3 units, Aut (Alonso)

104. Dynamic Behavior—(Enroll in Engineering 104.)

105. Feedback Control Design—(Enroll in Engineering 105.)
190. Directed Research and Writing in Aeronautics and Astronautics—Experimental or theoretical work for undergraduate students, under faculty direction, and emphasizing development of research and communication skills. Written report(s) and letter grade required; if this is not appropriate, enroll in 199. Consult faculty in area of interest for appropriate topics, including one of the graduate research groups or other special projects. Prerequisite: consent of Student Services Manager and instructor. (WIM)

3-5 units, any quarter (Staff)

199. Independent Study in Aeronautics and Astronautics—Directed reading, lab, or theoretical work for undergraduate students. Consult faculty in area of interest for appropriate topics involving one of the graduate research groups or other special projects. Prerequisite: consent of instructor.

1-5 units, any quarter (Staff)

200A. Applied Aerodynamics—Review of the fundamental equations of fluid dynamics and the physical assumptions on which they are based; overview of appropriate methods for solving these equations including nonlinear CFD, conformal mapping, linear panel and vortex methods; estimation of pressure distributions and resultant airloads on 2-D airfoils, finite wings, slender bodies, and lifting systems; compressibility effects; boundary layer analysis and prediction of drag, separation, and displacement effects. Application to airfoil and wing design. Prerequisite: undergraduate aeronautics course. Recommended: 210A.

3 units, Win (MacCormack)

200B. Applied Aerodynamics II—Analytical and numerical techniques for the aerodynamic analysis of aircraft, focusing on finite wing theory, far-field and Trefftz-plane analysis, two-dimensional laminar and turbulent boundary layers in airfoil analysis, similarity rules, aerodynamic stability derivatives. Bi-weekly assignments require MATLAB or a suitable programming language. Prerequisite: 200A or equivalent. Recommended: 210A.

3 units, Spr (Alonso)

201A. Fundamentals of Acoustics—Acoustic equations for a stationary homogeneous fluid; wave equation; plane, spherical, and cylindrical waves; harmonic (monochromatic) waves; simple sound radiators; reflection and transmission of sound at interfaces between different media; multipole analysis of sound radiation; Kirchhoff integral representation; scattering and diffraction of sound; propagation through ducts (dispersion, attenuation, group velocity); sound in enclosed regions (reverberation, absorption, and dispersion); radiation from moving sources; propagation in the atmosphere and underwater. Prerequisite: first-year graduate standing in engineering, mathematics, sciences, or consent of instructor.

3 units, Spr (Lele) alternate years, not given 2001-02

201B. Topics in Aeroacoustics—Acoustic equations for moving medium, simple sources, Kirchhoff formula, and multipole representation; radiation from moving sources; acoustic analogy approach to sound generation in compact flows; theories of Lighthill, Powell, and Mohring; acoustic radiation from moving surfaces; theories of Curi, FowcsWilliams, and Hawking; application of acoustic theories to the noise from propulsive jets, airframe noise and rotor noise; computational methods for acoustics. Prerequisite: 201A or consent of instructor.

3 units (Lele) not given 2000-01


3 units (Kroo) not given 2001-02

210A. Fundamentals of Compressible Flow—Introduction to compressible flow. Topics: development of the three-dimensional, nonsteady, field equations for describing the motion of a viscous, compressible fluid; differential and integral forms of the equations; constitutive equations for a compressible fluid; the entropy equation; compressible boundary layers; area-averaged equations for one-dimensional steady flow; shock waves; channel flow with heat addition and friction; flow in nozzles and inlets; oblique shock waves; Prandtl-Meyer expansion; unsteady one-dimensional flow; the shock tube; small disturbance theory; acoustics in one-dimension; steady flow in two-dimensions; potential flow; linearized potential flow; lift and drag of thin airfoils. Prerequisites: undergraduate background in fluid mechanics and thermodynamics.

3 units, Aut (Cantwell)

210B. Fundamentals of Compressible Flow—Continuation of 210A with emphasis on more general flow geometry. Use of exact solutions to explore the hypersonic limit. Identification of similarity parameters. Solution methods for the linearized potential equation with applications to wings and bodies in steady flow; their relation to physical acoustics and wave motion in nonsteady flow. Nonlinear solutions for nonsteady constant area flow and introduction to Riemann invariants. Elements of the theory of characteristics; nozzle design; extension to nonisentropic flow. Real gas effects in compressible flow. Flows in various gas dynamic testing facilities. Prerequisite: 210A.

3 units (Alonso) alternate years, given 2001-02

211A. Physical Gas Dynamics—(Enroll in Mechanical Engineering 262A.)

214A. Numerical Methods in Fluid Mechanics—The basic principles underlying the Navier-Stokes equations. Relations between time-accurate and relaxation methods. Implicit and explicit methods combined with flux splitting and space factorization. Considerations of accuracy, stability of numerical methods, and programming complexity. Prerequisites: knowledge of linear algebra and Mechanical Engineering 200A, 200B, or equivalent approved by instructor.

3 units, Aut (Pulliam)


3 units, Win (MacCormack)


3 units, Spr (MacCormack)

215A,B. Advanced Computational Fluid Dynamics—High resolution schemes for capturing shock waves and contact discontinuities; upwinding and artificial diffusion; LED and TVD concepts; alternative flow splittings; numerical shock structure. Discretization of Euler and Navier Stokes equations on unstructured meshes; the relationship between finite volume and finite element methods. Time discretization; explicit and implicit schemes; acceleration of steady state calculations;
residual averaging; math grid preconditioning. Automatic design; inverse problems and aerodynamic shape optimization via adjoint methods. Pre- or corequisite: 214B or equivalent.

3 units each, Win, Spr (Jameson)

217A,B,C. Mathematical and Computational Methods in Engineering—(Enroll in Mechanical Engineering 200A,B,C.)

218. Introduction to Symmetry Analysis—Introduction to the methods of symmetry analysis and their use in the reduction and simplification of physical problems. Topics: dimensional analysis, phase-space analysis of autonomous systems of ordinary differential equations, use of Lie groups to reduce the order of nonlinear ODEs and to generate integrating factors, use of Lie groups to reduce the dimension of partial differential equations and to generate similarity variables, exact solutions of nonlinear PDEs generated from groups. Symmetries and conservation laws, application to Hamiltonian systems, generalized symmetries, recursion operators, Backlund transformations, use of non-local groups to generate soliton solutions of nonlinear wave equations, symmetries derived from a potential equation. Invariant groups of the classical equations of mathematical physics. The two-body problem in classical mechanics, problems in nonlinear heat conduction, nonlinear waves, compressible flow, boundary layers, viscous jets and vortex rings, similarity rules for turbulent shear flows. Mathematica-based software developed by the instructor for finding invariant groups of ODEs and PDEs. Prerequisite: Mechanical Engineering 200A or equivalent.

3 units, Spr (Cantwell)


220. Parallel Methods in Numerical Analysis—(Enroll in Computer Science 238.)

225. Stochastic Processes in Aeronautics—Applications of probability theory to problems in aeronautics, emphasizing random behavior in fluid, thermodynamic, chemical, structural, and control systems of aerospace interest. The random-walk model introduces basic concepts and connects the topics. Time evolution of probability distributions, linking problems in chemical kinetics, rarefied gas flows, thermodynamic nonequilibrium, and finite difference methods in fluid mechanics. Statistical variables: power spectra, correlation functions, transform techniques, the response of a linear system to a random forcing function, and the statistical theory of turbulence. Stochastic models on microcomputers.

3 units (Staff) not given 2000-01

230. Rotorcraft Aerodynamics—The fundamental aerodynamics of rotocraft, including general momentum theory, blade-element theory, and physical concepts of blade motions in hover and forward flight. Topics: dynamics stall, blade-vortex interactions, and active blade controls. Prerequisite: undergraduate aerodynamics.

3 units (Yu) alternate years, given 2001-02

235A,B. Space Systems Engineering—(Enroll in Engineering 235A,B.)

236A. Spacecraft Design—The design of unmanned spacecraft and spacecraft subsystems concentrating on identification of design drivers and current design methods. Topics: spacecraft configuration design, mechanical design, structure and thermal subsystem design, attitude control, electric power, command and telemetry, and design integration and operations.

3 units, Win (Twiggs)

236B,C,D. Spacecraft Design—Continuation of 236A.

236B. 3 units, Spr (Twiggs)

236C. 3 units, Sum (Twiggs)

236D. 3 units, Aut (Twiggs)

238. Human-Centered Design for Aerospace Engineers—The what, when, who, and how of human-centered design. Is it art? or magic? Is it science? or engineering? How to integrate human-centered processes into engineering design processes. Analysis of several recent human-centered aeronautical and space systems to evaluate their successes and limitations.

3 units, Aut (Null)

240A. Analysis of Structures—Elements of two-dimensional elasticity theory. Boundary value problems; energy methods; analyses of solid and thin walled section beams, trusses, frames, rings, monocoque and semi-monocoque structures. Prerequisite: Engineering 14 or equivalent.

3 units, Aut (F. Chang)


3 units, Win (F. Chang)

241A,B. Introduction to Aircraft Design, Synthesis, and Analysis—The total development of new aircraft systems, emphasizing commercial aircraft: the underlying economic and technological factors that create markets for new aircraft from rational and historical viewpoints; determining market demands and system mission performance requirements; optimizing configurations to comply with requirements, emphasizing the interaction of various disciplines (aerodynamics, structures, propulsion, guidance, payload, and ground support; parametric studies); applied aerodynamic and design concepts for use in configuration analysis (airplane layout, wing design, high lift systems, drag, stability and control requirements, and tail sizing). Application to an individually chosen aeronautical system; applied structural fundamentals emphasizing fatigue and fail-safe considerations; design load determination; weight estimation; propulsion system performance and installation; engine types; environmental problems (noise and smoke); performance estimation (takeoff, climb, cruise, and landing). Direct/indirect operating costs prediction and interpretation. Aircraft functional systems (hydraulic, electrical, environmental control); avionics; importance and achievement of aircraft reliability and maintainability. Prerequisite: 100 or equivalent.

241A. 3 units, Win (Alonso)

241B. 3 units, Spr (Kroo)

242A. Continuum Mechanics: An Introduction—(Enroll in Mechanical Engineering 238A.)

242B. Continuum Mechanics: Applications—(Enroll in Mechanical Engineering 238B.)

243A,B. Dynamics—(Enroll in Mechanical Engineering 231A,B.)

244A. Free and Forced Motion of Structures—Vibrations and forced response of linear systems with a finite number of degrees of freedom. Vibrations and forced response of continuous structures, developed in a framework of analytical dynamics; rods, beams, membranes, and other elastic systems. Approximate methods for analyzing nonuniform and built-up structures. Finite-element methods in a dynamic context. Introduction to random responses and to nonlinear systems, as time permits. Prerequisites: 240A, Engineering 15 or equivalent.

3 units, Win (Ashley)

245. Structural Dynamics and Aeroelasticity—Finite-element methods and vibration of continuous, two-dimensional structures. Introduction to aeroelasticity from a unified viewpoint applicable to flight vehicles, rotating machinery, and other elastic systems. Aeroelastic operators and unsteady aerodynamics in two dimensions. Forced response, static and dynamic eigenvalues of a simplified system. Aeroelastic analysis of representative one- and two-dimensional systems. Com-
putational problems covering aerelastic analysis of simple systems. Prerequisite: familiarity with MATLAB or a programming language.

3 units (Alonso) alternate years, given 2001-02

246A. Theory of Plates—(Enroll in Mechanical Engineering 241A.)

246B. Theory of Shells—(Enroll in Mechanical Engineering 241B.)

246D. Vibration and Stability of Plates and Shells: Biomechanical Applications—(Enroll in Mechanical Engineering 241D.)


3 units, not given 2000-01

252. Techniques of Failure Analysis—Introduction to the field of failure analysis, including fire and explosion analysis, large scale catastrophe projects, traffic accident reconstruction, aircraft accident investigation, human factors, biomechanics and accidents, design defect cases, materials failures and metallurgical procedures, and structural failures. Product liability, failure modes and effects analysis, failure prevention, engineering ethics, and the engineer as expert witness. Prerequisite: Engineering 14 or equivalent.

2 units, Spr (Ross)


3 units, Win (Springer)


3 units, Spr (F. Chang)

261A. Statistical Theory and Modeling for Turbulent Flow—(Enroll in Mechanical Engineering 261A.)

268. Digital Image Processing—(Enroll in Electrical Engineering 368A.)

269. Optical Methods in Engineering Science—(Enroll in Electrical Engineering 347.)

270. Introduction to Modern Optics—(Enroll in Electrical Engineering 268.)

271A. Dynamics and Control of Aircraft and Spacecraft—The dynamic behavior of aircraft and spacecraft, and the design of automatic control systems for them. For aircraft: non-linear and linearized longitudinal and lateral dynamics; linearized aerodynamics; natural modes of motion; autopilot design to enhance stability, control the flight path, and perform automatic landings. GPS based navigation and attitude determination. For spacecraft in orbit: natural longitudinal and lateral dynamic behavior and the design of attitude control systems. Prerequisites: 200A or 208; Engineering 15 or equivalent, Engineering 105, and experience with Matlab.

3 units, Spr (Staff)

272C. Global Positioning System—The principles of satellite navigation using GPS. Positioning techniques using code tracking, single and dual frequency, carrier aiding, and use of differential GPS for improved accuracy and integrity. Use of differential carrier techniques for attitude determination and precision position determination. Prerequisite: familiarity with matrix algebra.

3 units, Win (Eng)
SCHOOL OF ENGINEERING

GRADUATE PROGRAMS

UNDERGRADUATE PROGRAM

BACHELOR OF SCIENCE

The Chemical Engineering depth sequence required for the B.S. degree (see the “School of Engineering” section of this bulletin) provides training in applied chemical kinetics, biochemical engineering, electronic materials, engineering thermodynamics, plant design, polymers, process analysis and control, separation processes, and transport phenomena. The B.S. program in Chemical Engineering additionally requires basic courses in biology, chemistry, engineering, mathematics, and physics.

There is no set B.S. program for Chemical Engineering students to follow. A sample program is available from the department’s advisers, the Dean’s Office in the School of Engineering, and at the Handbook for Undergraduate Engineering Programs, http://ughb.stanford.edu/index.js.html. It is recommended that the student discuss the prospective program with his or her adviser, especially if transferring from biology, chemistry, physics, or another field in engineering. With some advanced planning, the student can usually arrange to attend one of the overseas campuses.

For information about a Chemical Engineering minor, see the “School of Engineering” section of this bulletin.

GRADUATE PROGRAMS

The University’s requirements for the M.S., Engineer, and Ph.D. degrees are outlined in the “Graduate Degrees” section of this bulletin.

MASTER OF SCIENCE

An M.S. program comprising an academic year of appropriate course work is available to accommodate students wishing to pursue a professional chemical engineering career after receiving the B.S. degree. The M.S. degree is awarded, without requiring a formal thesis, after a minimum of three quarters of broad study, subject to the specifications stated below.

Unit and Course Requirements—For students terminating their graduate work with the M.S. degree in Chemical Engineering, a program consisting of 42 units of academic work is required, including at least four lecture courses selected from the Chemical Engineering 200 to 400 lecture series. The remaining courses comprise all science or engineering graduate courses, and by petition to the Chair of the Department of Chemical Engineering, upper-division undergraduate courses in science and engineering. Credit toward the M.S. degree is not given for Chemical Engineering Special Topics courses numbered 500 to 512, or for the colloquium, 699. However, students must register for 699 and attend the colloquia.

Students wishing to obtain research experience should choose a research adviser and enroll in Chemical Engineering 600; up to 6 units may count toward the 42-unit requirement. Chemical Engineering 600, however, may not be substituted for any of the required four lecture courses in the Chemical Engineering 200 to 400 lecture series. A written report describing the results of this research must be submitted to and approved by the research adviser.

To ensure that an appropriately balanced program is taken by all M.S. candidates, the student’s program must be approved by the graduate adviser, and a program proposal for the M.S. degree should be developed by the student and adviser at their first meeting of the academic year.

Residency Requirement—See General Requirements in the “Graduate Degrees” section of this bulletin.

Minimum Grade Requirement—All courses intended to satisfy the 42-unit M.S. degree requirement must be taken for letter grades, if offered, and an overall grade point average (GPA) of 3.0 must be maintained.
ENGINEER

The degree of Engineer is awarded after completion of six quarters of study beyond the B.S. degree, plus the requirements listed below. This degree is not required to enter the Ph.D. program.

Unit and Course Requirements—A minimum of 72 total units (including research) and 42 units of course work is required for the Engineer degree, including the following Chemical Engineering courses: 300, 310A, 310B, 340, 345, 350, 355, and one quarter of 370. The remaining courses, to total 42 units, may be chosen from the basic sciences and engineering according to the guidelines given in the Master of Science section above and with the consent of the graduate adviser. Students seeking the Engineer degree may apply for the M.S. degree once the requirements for that degree have been fulfilled (see above Master of Science section).

Residency Requirement—See General Requirements in the "Graduate Degrees" section of this bulletin.

Minimum Grade Requirement—All courses intended to satisfy the degree requirements must be taken for letter grades, if offered, and an overall grade point average (GPA) of 3.0 must be maintained.

Thesis Requirement—The thesis must represent a substantial piece of research equivalent to nine months of full-time effort and must be approved by a reading committee consisting of two members of the Chemical Engineering faculty.

Qualification for the Ph.D. Program by Students Receiving the Degree of Engineer—After completing all the requirements for the Engineer degree, a student may request to be examined on the Engineer research work for the purpose of qualifying for the Ph.D. If the request is granted, the student’s thesis must be available in its final form for inspection by the faculty and must have been approved by the reading committee at least two weeks prior to the scheduled date of the examination.

DOCTOR OF PHILOSOPHY

The Ph.D. degree is awarded after completion of a minimum of nine quarters of study plus the requirements listed below.

Unit and Course Requirements—A minimum of 72 total units (including research) and 42 units of course work is required for the Ph.D. degree, including the following Chemical Engineering courses: 300, 310A, 310B, 340, 345, 350, 355, and one quarter of 370. In addition, two courses must be taken from one of the areas of concentration in the 440, 450, or 460 series. The remaining courses, to total 42 units, may be chosen from the basic sciences and engineering according to the guidelines given in the above Master of Science section and consent of the graduate adviser. Students seeking the Ph.D. degree may apply for the M.S. degree once the requirements for that degree have been fulfilled (see above Master of Science section).

Residency Requirement—See General Requirements in the Graduate Degrees section of this bulletin.

Minimum Grade Requirement—All courses intended to satisfy the degree requirements must be taken for letter grades, if offered, and an overall grade point average (GPA) of 3.0 must be maintained.

Teaching Requirement—All Ph.D. candidates, regardless of the source of their financial support, are required to gain teaching experience as an integral part of graduate training in the Department of Chemical Engineering.

Qualifying Examination—To be advanced to candidacy for the Ph.D. degree, the student must pass a preliminary qualifying examination. First-year students are asked to present orally and defend a critical review of a published paper before the faculty at the beginning of their first Spring Quarter. This examination is used to decide whether or not these students will be allowed to choose research advisers and begin thesis research in the Spring Quarter of their first year. Failing this examination leads to termination of the student’s study towards the Ph.D. degree. It also precludes financial aid beyond that already promised. Under these circumstances, the student may apply for the M.S. degree once the requirements for that degree have been fulfilled (see above Master of Science section). Students passing this preliminary examination take a qualifying examination consisting of an oral defense of their research work before the faculty early in the Autumn Quarter of their second year.

Dissertation Requirement—A dissertation based on a successful investigation of a fundamental problem in chemical engineering is required; the student enrolls in Chemical Engineering 600 during the course of this research. In four to five calendar years after enrolling in the department, the student is expected to have fulfilled all the requirements for the Ph.D., including submission of a completed dissertation that has already been approved by his or her research adviser to the reading committee. No sooner than four weeks after this date, the student’s University oral examination is scheduled. This exam, based on the candidate’s dissertation research, is in the form of a public seminar followed by private questioning by an examining faculty committee. After satisfactory performance in the examination and submission of the dissertation to the Degree Progress, Office of the Registrar, the Ph.D. degree is awarded.

RESEARCH ACTIVITIES

Research investigations are currently being carried out in the following fields: applied statistical mechanics, bio catalysis, bioengineering, colloid science, computational materials science, electronic materials, hydrodynamic stability, kinetics and catalysis, Newtonian and non-Newtonian fluid mechanics, polymer science, rheo-optics of polymeric systems, and surface and interface science. Additional information may be found at the Department of Chemical Engineering website http://chemeng.stanford.edu.

FELLOWSHIPS AND ASSISTANTSHIPS

A number of fellowships and assistantships are awarded each year to incoming students. Application forms may be obtained from the department. The completed application must be received no later than January 15 preceding the start of the academic year for which the award is to be made.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

PRIMARILY FOR UNDERGRADUATES

20. Introduction to Chemical Engineering—(Enroll in Engineering 20.)
3 units, Aut (Robertson)

50Q. Stanford Introductory Seminar: Drug Delivery in the 21st Century—In the near future, medication will be delivered with highly engineered, controlled delivery systems. Such systems, currently available for motion sickness, heart pain, and high blood pressure, are developed by joining chemistry, biology, medicine, materials science, and engineering to design novel drug delivery devices. Students visit local companies where such devices are made. Guest scientists and engineers describe products on the market and in the pipeline. One sophisticated drug delivery system, the cigarette, is studied, learning about a technology that has created more harm than good; however, what we learn from it someday might form the basis for a therapeutic delivery system. Recommended: prior exposure to chemistry, physics, biology, mathematics, physiology.
3 units, Aut (Robertson, Rosen)

25. Biotechnology—(Enroll in Engineering 25.)
3 units, Aut (Robertson)

100. Chemical Process Modeling, Dynamics, and Control—Mathematical methods are applied to engineering problems, using chemical engineering examples. The development of mathematical models to describe chemical process dynamic behavior. Analytical and computer simulation techniques for the solution of ordinary differential equations. Dynamic behavior of linear first- and second-order systems. Introduc-
tion to process control. Dynamics and stability of controlled systems. Prerequisites: Mathematics 53 or 130, or Engineering 155A, or equivalent; Engineering 20.
3 units, Aut (Staff)

110. Equilibrium Thermodynamics—Thermodynamic properties, equations of state, properties of non-ideal systems including mixtures, and phase and chemical equilibria. Prerequisite: Chemistry 171.
3 units, Win (Madix)

120A. Fluid Mechanics—The flow of isothermal fluids from a momentum transport viewpoint. Continuum hypothesis, scalar fields, fluid statics, deformation of continuous media, non-Newtonian fluids, the equations of motion, creeping and potential flow, boundary layer theory, turbulence, free-surface phenomena, theory of stability. Prerequisites: junior standing in chemical engineering or consent of instructor; 100, and Mathematics 53 or Mathematics 130 or Engineering 155A, or equivalent.
4 units, Win (Shaqfeh)

120B. Energy and Mass Transport—The transport of energy and mass in solid and fluid continua. Fourier's law, heat transfer in solids, laminar flow, forced and free convection, boundary-layer heat transfer, natural convection with application to geophysical flows, energy transport by radiation, Fick's law, mass transfer with chemical reaction, transport in turbulent flows, heat and mass transfer analogies. Prerequisite: 120A or equivalent.
4 units, Spr (Fuller)

130. Separation Processes—Analysis and design of equilibrium and non-equilibrium separation processes. Possible examples: distillation, liquid-liquid extraction, electrophoresis, centrifugation, chromatography, and reaction-assisted separation processes.
3 units, Spr (Musgrave)

140. Microelectronics Processing Technology—The chemistry and transport of microelectronics device fabrication. Introduction to solid state materials and electronic devices. Chemical processes including crystal growth, chemical vapor deposition, etching, oxidation, doping, diffusion, metallization, and plasma processing with emphasis on chemical, kinetic and transport considerations.
3 units, Spr (Bent)

150. Biochemical Engineering—The general principles used in the biological production of fine biochemicals, with an emphasis on biopharmaceuticals. Basic and applied principles in: enzyme kinetics, microbial physiology, recombinant DNA technology, metabolic engineering, fermentation media design, fermentor design, aseptic processing, fermentation process control and scale-up, product isolation, protein purification, protein folding, regulatory issues, and biochemical process cost modeling.
3 units, Aut (Swartz)

160. Polymer Science and Engineering—Introduction to polymer science, including free-radical and condensation polymerization, morphology of amorphous and semicrystalline polymers, linear viscoelasticity and rheology. Selected applications of polymers in information technology.
3 units, Win (Frank)

3 units, Aut (Gast)

180. Chemical Engineering Plant Design—Open to seniors in chemical engineering or by consent of instructor. Application of chemical engineering principles to the design of practical plants for the manufacture of chemicals and related materials. Topics: flow-sheet development from a design concept, equipment design for distillation, chemical reactors, heat transfer, pumping, and compression; estimation of capital expenditures and production costs; plant construction.
3 units, Spr (Pavone)

185A.B. Chemical Engineering Laboratory—Investigation of the experimental aspects of chemical engineering science, emphasizing development of communications skills. Experiments illustrating lecture subjects are conducted by groups of students. Lab. (WIM)
185A. 3 units, Aut (Frank)
185B. 3 units, Win (Klug)

190. Undergraduate Research in Chemical Engineering—Lab or theoretical work for undergraduate students under the direct supervision of a faculty member. Research in one of the graduate research groups or other special projects in the undergraduate chemical engineering lab. Students should consult advisers for information on available projects.
(Staff)

PRIMARILY FOR GRADUATE STUDENTS

240. Microelectronic Processing Technology—See 140.
3 units, Spr (Bent)

250. Biochemical Engineering—See 150.
3 units, Aut (Swartz)

3 units, Win (Frank)

300. Applied Mathematics in Chemical Engineering—Mathematical problems in transport phenomena, fluid mechanics, reactor design, quantum chemistry, and polymer science. Applications of tensor calculus, ordinary differential equations, linear eigenvalue problems, perturbation theory (regular and singular), topics in partial differential equations, Fourier transforms. Prerequisites: Mathematics 53, 113, 130; or Engineering 155A, Mathematics 131 or Engineering 155B, or equivalent.
3 units, Aut (Klug)

310A. Microscale Transport—Introduction to transport on small scales where macroscopic or bulk convective processes are unimportant. The basic equations of mass, momentum, and energy are derived for incompressible fluids. Local analysis based on the flow kinematics. Simplifications of these equations in the Stokes or creeping flow regime; solution techniques for these reduced sets of equations. Topics: Green's function or boundary integral solution methods, point particle solutions, rigid or semi-rigid particulate motion in suspension, drop and bubble flows including thermocapillary motion, lubrication theory and the effective properties of composite media and suspensions; and time permitting, slender body theory and Brownian motion. Prerequisites: 120A, 120B, 300, or equivalents.
3 units, Win (Fuller)

310B. Connective Transport and Reaction Engineering—Continuation of 310A. Macroscale or convective transport of mass, momentum, and energy including chemical reaction from a fundamental perspective. Topics: inviscid flow theory and its coupling to mass, momentum, and energy boundary layers including free jets and wakes; boundary layers adjoining regions of constant circulation (e.g., drop flows) including Prandtl-Batchelor layers; convective mass transport with and without reaction, including Taylor-dispersion and generalized Graftel problems; the fundamentals for mass, momentum, and energy transport correlations. The concepts are applied to basic reaction engineering. Prerequisite: 310A or consent of the instructor.
3 units, Spr (Homsey)

3 units (Staff)

345. Spectroscopy and Applications of Quantum Mechanics—Development of theoretical approaches to spectroscopy, including spectroscopic transitions, transition probabilities, and selection rules. Photon and electron spectroscopies of the gas and solid phase. Topics: infrared, electron energy loss and Raman vibrational spectroscopies; Auger, x-ray and ultraviolet photoelectron spectroscopies; synchrotron-based spectroscopies including near edge x-ray absorption fine structure; basic nuclear magnetic resonance. Possible topics: solid state and computational methods. Prerequisite: Chemistry 271 or quantum mechanics.

3 units, Win (Bent)

350. Principles of Cellular Systems—Introduction to biological systems for engineering students. Emphasis is on viewing the cell as an integrated network of processes. Topics: what is the genome and how is it interpreted, how are cells organized spatially and energetically, protein catalysis, regulation of protein expression and other cellular processes, and new techniques in functional genomics. Biological Sciences 52 may be substituted.

3 units, Aut (Kao)

355. Advanced Biochemical Engineering—The technological tools for exploiting the power offered by modern biology. How a cell interacts with and influences its environment, how a production organism is optimized, what technology is used for large scale production, how products are isolated and purified, how proteins can be made without living cells, how a biopharmaceutical is formulated and delivered, and what the regulatory requirements are for drug approval and sale. Prerequisite: 350 or Biological Sciences 52, or equivalent.

3 units, Win (Swartz)

370A,B,C,D. Introduction to Chemical Engineering Research—One-quarter research projects (laboratory, library, or theoretical research) under the guidance of a faculty member. Findings are reported in a poster session for the entire department at the end of the quarter, with a written report to adviser.

3 units, Aut, Win, Spr, Sum (Staff)


3 units, Spr (Gast)

422. Structure and Reactivity of Solid Surfaces—The structure of solid surfaces, including a description of experimental methods for determining the structures of single crystal surfaces. The adsorption of molecules on these surfaces, e.g., the thermodynamics of adsorption processes, surface diffusion, and the molecular structure of the adsorbates. Surface mediated reactions, i.e., heterogeneous catalysis, including descriptions of catalytic mechanisms and surface kinetics.

3 units, Win (Madix)

444A. Quantum Simulations of Molecules and Materials—Molecules and surfaces: quantum atomistic simulations of molecules and surfaces to predict atomic structure, properties, reaction mechanisms, and kinetics. Review of quantum mechanics. Electronic structure calculations: Hartree Fock, configuration interaction, many body perturbation theory, and density functional theory. Property calculations: energy, forces, structure, and electronic and vibrational spectra. Applications to semiconductor processing, surface science, biochemistry, catalysis, polymers, environmental chemistry, and combustion. Prerequisite: undergraduate level quantum mechanics.

3 units, Win (Musgrave)

450. Introduction to Biotechnology—(Same as Biochemistry 237, Civil and Environmental Engineering 237, Developmental Biology 237, Structural Biology 450.) Faculty from the departments of Biochemistry, Biological Sciences, Chemical Engineering, Civil and Environmental Engineering, Developmental Biology, Structural Biology, and invited industrial speakers review the interrelated elements of modern biotechnology. Topics: protein structure and dynamics, protein engineering, biocatalysis, gene expression, cellular metabolism and metabolic engineering, fermentation technology, and purification of biomolecules. Prerequisite: graduate student or upper-division undergraduate in the sciences or engineering.

3 units, Spr (Robertson, Swartz)

452. Protein Science and Engineering—(Same as Chemistry 232.) The physio-chemical interactions that govern the structure and function of proteins. Topics: protein function and structure, techniques for probing protein structure and function, mechanisms of protein function, design of proteins with novel properties. Examples from the literature on enzymes. Recommended: background in physical and organic chemistry.

3 units, Win (Khosla)

454. Metabolic Engineering Methods and Applications—The optimization of industrial organisms for maximal benefit. In the context of actual applications, metabolic pathways and how they are regulated, metabolic flux analysis, and traditional and rDNA methods for genetic engineering. Examples in the areas of: metabolite production, DNA protein production by bacteria and mammalian cells, petroleum desulfurization, bioremediation, and cell-free protein synthesis. Prerequisites: 250, 355 or equivalent.

3 units, Spr (Swartz) alternate years, not given 2001-02

459. Frontiers in Interdisciplinary Biosciences—(Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible.) Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford’s Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

2 units, Aut, Win, Spr (S. Block)

460. Polymer Physics—The application of statistical thermodynamics to elucidate structural properties of high molecular weight polymers. The conformation of single polymer chains in solution and the bulk with the analysis based on rotational isomeric state theory and the experimental verification coming from scattering measurements. Statistical thermodynamic analyses for the study of phase behavior in polymer solutions, blends blocks copolymers, and liquid crystals. Non-equilibrium features of glassy polymers, including theories of the glass transition and physical aging. The theories used to treat the kinetics of polymer crystallization, including the Avrami and Lauritzen-Hoffman approaches.

3 units, Spr (Frank) alternate years, not given 2001-02

462. Dynamics of Complex Liquids—Flow and orientation phenomena of polymeric and colloidal liquids; fundamental concepts of rheology; diffusion processes in complex liquids; molecular models of dilute and concentrated polymer solutions and melts (flexible and rigid systems);
reptation and scaling theories of polymer liquids; introduction to liquid crystals, surfactant liquids, and suspensions. Prerequisites: 300, 310A. 3 units, Spr (Shaqfeh)

500-512. Special Topics in Chemical Engineering—Discussion of recent developments and current research in specialized fields. Units by arrangement. Prerequisite: consent of instructor. 
Aut, Win, Spr

500A,B,C. Protein Biotechnology
(Swartz)

501A,B,C. Semiconductor Processing
(Benti)

502A,B,C. Computational Materials Science
(Musgrave)

503A,B,C. Biocatalysis
(Khosla)

504A,B,C. Bioengineering
(Robertson)

505A,B,C. Microrheology
(Fuller)

506A,B,C. Surface and Interface Science
(Madix)

507A,B,C. Polymer Physics and Molecular Assemblies
(Frank)

508A,B,C. Stability of Fluid Motions
(Homsy)

509A,B,C. Statistical Mechanics of Dispersed Systems
(Gast)

510A,B,C. Transport Mechanics
(Shaqfeh)

511A,B,C. NMR of Solids
(Klug)

512A,B,C. Functional Genomics
(Kao)

600. Graduate Research in Chemical Engineering—Lab and theoretical work for graduate students on chemical engineering problems leading to partial fulfillment of requirements for an advanced degree. Credit is given after the student has satisfied the specific report or dissertation requirement. 
(Staff)

699. Colloquium—Students attend the colloquia of the Department of Chemical Engineering. Must be taken every quarter by candidates for advanced degrees in Chemical Engineering. (AU) I unit, Aut, Win, Spr (Staff)

CIVIL AND ENVIRONMENTAL ENGINEERING


Chair: Clyde B. Tatum
Associate Chair: Lynn M. Hildemann


Associate Professors: Ronald L. Borja, Craig S. Criddle, Gregory G. Deierlein, Martin Fischer, David L. Freyberg, Lynn M. Hildemann

Assistant Professors: Mark Z. Jacobson, Laura N. Lowes, Charles A. Menun, Eduardo Miranda, Alfred M. Spormann

Professors (Research): Hans C. Bjornsson, C. Allin Cornell, Martin Reinhard

Professor (Teaching): Gilbert M. Masters

Courtey Professors: Joel H. Fenziger, Thomas J. Hughes, Robert McGinn, Peter M. Pinsky, David Pollard, George S. Springer


Consulting Associate Professors: Steve Armfield, Mark N. Goltz, Michael E. London, Melody Spradling, Jane Woodward, Yan Zang

Consulting Assistant Professors: Ronald J. Calhoun, Olaf Cirpka, George Redden

Lecturers: Derek Fong, Renate Fruchter, Mark Kroll

Visiting Professor: Katsuhiro Ishida

Visiting Associate Professors: Amatzia Genin, Jerome F. Hajjar

The undergraduate Civil Engineering major provides a pre-professional program balancing the fundamentals common to many special fields of civil engineering with specialization in Environmental and Water Studies or Structures and Construction. The undergraduate Environmental Engineering major offers a more focused program in Environmental Engineering Science. Laboratory facilities are available to students in building energy, construction, environmental engineering science, experimental stress analysis, fluid mechanics, and structural and earthquake engineering.

At least one year of graduate study is strongly recommended for professional practice. Students who contemplate advanced study at Stanford should discuss their plans with their advisers in the junior year. The co-terminal B.S.-M.S. program should be considered by students who want an integrated five-year program. Potential coterminal students in Environmental Engineering Science should be aware that applications are considered once a year, near the beginning of Winter Quarter.

The Department of Civil and Environmental Engineering (CEE), in collaboration with other departments of the University, offers graduate degree programs in:

Construction Engineering and Management

Environmental and Water Studies

Environmental Engineering and Science

Environmental Fluid Mechanics and Hydrology

Structural Engineering and Geomechanics

Geomechanics

Structural Engineering

Research work and instruction under these programs are carried out in the following facilities: Building Energy Laboratory, Environmental Fluid Mechanics Laboratory (EFML), Geotechnical Engineering Laboratory, Structural Engineering Laboratory, and water quality control research and teaching laboratories. Research in earthquake engineering is conducted in the John A. Blume Earthquake Engineering Center. Research on control of hazardous substances is coordinated within the Western Region Hazardous Substance Research Center.

In collaboration with the Department of Computer Science, the Center for Integrated Facility Engineering (CIFE) employs advanced CAD, artificial intelligence, communications concepts, and information management to integrate the presently fragmented participants in the facility development process and to support design and construction automation. CIFE is stimulating significant new research and educational activities in the two departments.

PROGRAMS OF STUDY

The Construction Engineering and Management program prepares technically qualified students for responsible management roles in all
phases of the development of major constructed facilities. It emphasizes management techniques useful in planning, coordinating, and controlling the activities of diverse specialists (designers, contractors, subcontractors, and client representatives) within the unique project environment of the construction industry. In addition, the program offers subjects that focus on the engineering aspects of heavy, industrial, residential, and building construction. By appropriate choice of elective subjects, students wishing to work for a contractor, construction management consultant, design firm, or the facilities department of an owner’s organization can design a program for their needs.

The construction curriculum includes core courses, construction engineering electives, and construction management electives. Subjects offered include building systems, construction administration, construction finance and accounting, design and construction of housing, real estate development, equipment and methods, estimating, international construction, labor relations, managing human resources, planning and control techniques, productivity improvement, and project and company organizations. Additional related course work is available from other programs within the department, from other engineering departments, and from other schools in the University such as Earth Sciences and the Graduate School of Business.

The program leads to the degrees of Master of Science (M.S.), Engineer, and Ph.D. Students with undergraduate degrees in chemical, electrical, mechanical, mining, and petroleum engineering, or in architecture who do not wish to satisfy the undergraduate prerequisite courses for the M.S. in Civil and Environmental Engineering—Construction Engineering and Management have the option of meeting the same graduate course requirements as the above and obtaining the M.S. in Engineering—Construction Engineering and Management. A limited number of M.S.-level graduate students and most Ph.D. candidates are supported each year through the sponsored research and teaching activities and through industry-sponsored fellowships.

The Construction Program faculty and students are active participants in the Center for Integrated Facility Engineering (CIFE). CIFE conducts research on the automation, integration, and management of technology.

The program maintains close ties with the construction industry through the Stanford Construction Institute. Students participate in weekly discussions with visiting lecturers from all sectors of the U.S. construction industry.

DESIGN/CONSTRUCTION INTEGRATION

To better prepare graduates for successful careers as design and construction professionals making major contributions to integrated projects, the Department of Civil and Environmental Engineering offers a Master of Science degree field in Design/Construction Integration.

The purpose of the new degree field is to educate professionals who have a strong design or construction background, understand the goals and concerns of the many other project stakeholders, and are prepared for multidisciplinary collaborative teamwork in an integrated design and construction process.

The field of Design/Construction Integration is open to applicants with backgrounds in engineering and science. Applicants should also have a background in the planning, design, or construction of facilities by virtue of previous work experience and/or their undergraduate education. Knowledge in basic subjects from the traditional areas of civil engineering is necessary for students to receive the degree and to satisfy prerequisite requirements for some of the required graduate courses.

The field in Design/Construction Integration requires 45 quarter units, which are normally completed in one academic year. This includes core courses in design/construction integration, structural and geotechnical engineering, and construction engineering and management, along with approved electives.

The department offers three programs related to the design and construction of facilities: Structural Engineering and Geomechanics (S/G), Construction Engineering and Management (CEM), and Design/Construction Integration (DCI).

The S/G program prepares students to launch careers as designers, engineering analysts, engineering risk managers, specialty consultants, or tool developers. It encompasses structural analysis and design, dynamics, earthquake engineering, risk and reliability analysis, modern computational methods, and geomechanics.

The CEM program prepares technically qualified students for responsible management roles in all phases of the development of major constructed facilities. It emphasizes management techniques useful in organizing, planning, and controlling the activities of diverse specialists working within the unique project environment of the construction industry. The program also includes the engineering aspects of heavy, industrial, and building construction.

The DCI program prepares students for multidisciplinary collaborative teamwork in an integrated design and construction process. The program extends a student’s design or construction background with core courses in each of these areas and develops the background needed to understand the concerns and expertise of the many project stakeholders. It includes a comprehensive project-based learning experience.

Prospective students should use their intended career path as the primary criterion in selecting between these three programs. S/G best fits students planning to focus on designing facilities; CEM is for students planning to emphasize building facilities or managing teams and operations. Both of these degree options provide background for many different types of careers in design and construction, with some emphasis on preparation for working on projects using the traditional form of contracting and organization that characterizes public works. Students planning careers in design or construction firms that emphasize design-build, EPC, or turnkey projects should consider DCI. All three of these degree options include substantial flexibility for students to tailor their program of study to career interests.

ENVIRONMENTAL AND WATER STUDIES

This program covers a broad spectrum of specialties, including environmental engineering and science, environmental fluid mechanics, environmental planning, and hydrology. Course offerings are scheduled to permit either intensive study in a single area or interrelated study between areas. Seminars provide a broad coverage of environmental problems. The programs are kept flexible to foster interaction among students and to encourage the development of individual programs suitable for a broad range of engineering and science backgrounds and career goals. The Stanford laboratories for water quality control and environmental fluid mechanics are well equipped and instrumented for advanced research and instruction.

Students with backgrounds in all areas of engineering and science who are interested in applying their specialized abilities to solving environmental and water problems are welcome. Comprehensive introductory courses in each major area of study are given to provide common understanding among those with dissimilar backgrounds. Courses from many other programs and departments both complement and supplement these course offerings. Some examples include Computer Science (numerical methods), Geologic and Environmental Sciences (geostatistics, hydrogeology), Mechanical Engineering (applied math, experimental methods, fluid mechanics, heat transfer), Petroleum Engineering (reservoir engineering, well-test analysis), and Statistics (probability and statistics).

The major areas of specialization in the two programs, environmental engineering and science, and environmental fluid mechanics and hydrology, are described below. Admissions to these two programs are handled separately; prospective students should clearly indicate their preference on their application by specifying one or the other area of specialization.

The Environmental Engineering and Science Program emphasizes the chemical and biological processes involved in pollution treatment, remediation, and control issues. Course offerings include the biological, chemical, and engineering aspects of water supply; the movement and fate of pollutants in surface and groundwater, soils, and the atmosphere; hazardous substance control; molecular environmental biotechnology; and water and air pollution. Companion courses in the Environmental Fluid Mechanics and Hydrology Program include environmental planning and impact assessment, as well as environmental fluid mechanics, hydrology, and transport modeling. Research on hazardous substances is coordinated through the Western Region Hazardous Substance Re-
The objective of this center, sponsored by the U.S. Environmental Protection Agency, is to promote through fundamental and applied research the development of alternative and advanced physical, chemical, and biological processes for the treatment of hazardous substances in the environment, with emphasis on groundwater contamination.

The Environmental Fluid Mechanics and Hydrology Program focuses on developing an understanding of the physical processes controlling the movement of mass, energy, and momentum in the water environment and the atmosphere. The program also considers environmental and institutional issues involved in planning water resources development projects. Environmental fluid mechanics courses address experimental methods; fluid transport and mixing processes; the fluid mechanics of stratified flows; natural flows in coastal waters, estuaries, lakes, and open channels; and turbulence and its modeling. Hydrology courses consider flow and transport in porous media, stochastic methods in both surface and subsurface hydrology, and watershed hydrology and modeling. Atmosphere-related courses deal with climate, weather, storms and air pollution and their modeling. Planning courses emphasize environmental policy implementation and sustainable water resources development. The research of this group is focused primarily in the Environmental Fluid Mechanics Laboratory, which includes the P. A. McCuen Environmental Supercomputer Center.

STRUCTURAL ENGINEERING AND GEOMECHANICS

Structural engineering at Stanford encompasses computational mechanics, computer-aided engineering, risk and reliability analysis, structural analysis and design, and teaching and research programs in earthquake engineering and structural dynamics. The programs are designed to provide a broad knowledge in these fields and to prepare students for industrial or academic careers. Academic programs can be designed to meet the needs of students wishing to launch careers as consultants on large and small projects, designers, and engineering analysts. Students have the opportunity to balance strong engineering fundamentals with modern computational methods.

Course work in earthquake engineering and structural dynamics provides an understanding of the earthquake phenomenon, the resulting ground shaking, and in-depth knowledge on the behavior, analysis, and design of various types of structures under seismic or other dynamic forces. Automated structural monitoring devices and control systems, and the utilization of advanced materials for civil infrastructures and seismic retrofits, are part of the ongoing research activities. Advanced analytical and experimental research in earthquake engineering is conducted at the John A. Blume Earthquake Engineering Center, which houses static and dynamic testing equipment including two shaking tables.

Reliability and risk analysis focuses on instruction and research in advanced methods for structural safety evaluation and design, including methods for loss estimation from damage and failures of structures and lifeline systems. Course work combines a strong background in structural analysis and design with probability theory and statistics. Research in this area deals with regional loss and damage evaluation, reliability of marine systems, seismic risk and reliability of large structural systems, and wind hazards.

Courses and research in structural analysis and design focus on the conceptual and detailed design of structural systems and on computational methods for predicting the static and dynamic, linear and non-linear response of structures. Included are courses that emphasize earthquake resistant design and computer-based design concepts. Related course work is available from other departments such as computer science, materials science and engineering, and mechanical engineering. In collaboration with CIFE, issues involving design for constructibility, engineering information management and collaborative engineering are addressed as an integral part of the research.

Computational mechanics emphasizes the application of modern computing methods to structural engineering and geomechanics. It draws on the disciplines of computer science, mathematics, and mechanics, and encompasses numerical structural and geotechnical analysis, including finite element analysis and boundary element methods. There is collaborative research in high performance computing with the Scientific Computing and Computational Mathematics Program.

Students with primary interests in the application of the principles of applied mechanics to problems involving geologic materials have the option of enrolling in a degree program in geomechanics. This program focuses on instruction and research in theoretical soil and rock mechanics, computational methods, and analysis and design of foundations and earth structures. In addition to the program's offerings, related courses are available in construction engineering, earth sciences, structural engineering, and the water resources program.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

Students who major in civil engineering or in environmental engineering must complete the appropriate requirements for the B.S. degree listed under Undergraduate Programs in the "School of Engineering" section of this bulletin. Elective units may be used in any way the student desires, including additional studies in civil and environmental engineering. Because the undergraduate engineering curriculum is designed to ensure breadth of study, students who intend to enter professional practice in civil or environmental engineering should plan to obtain their professional education at the graduate level.

A number of undergraduate programs at Stanford may be of interest to students seeking to specialize in environmental studies. In addition to the two majors offered within our own department, interested students should examine related programs such as Earth Systems, Geophysical and Environmental Sciences, Urban Studies, and Human Biology.

For information about a Civil Engineering minor, see the "School of Engineering" section of this bulletin.

HONORS PROGRAM

This program leads to a B.S. with Honors in Civil Engineering or in Environmental Engineering. It is designed to encourage highly qualified students to undertake a more intensive study of civil and environmental engineering than is required for the normal major via a substantial, independent research project.

The program involves an in-depth research study in an area proposed to and agreed to by a Department of Civil and Environmental Engineering (CEE) faculty adviser and completion of a thesis of high quality. A written proposal for the research to be undertaken must be submitted and approved in the fourth quarter prior to graduation. The thesis is supervised by a CEE faculty adviser and must involve input from the School of Engineering Writing Program by means of Engineering 102S or its equivalent. Students are encouraged to present their results in a seminar for faculty and other students. Up to 10 units of CEE 199, Undergraduate Research in Civil and Environmental Engineering, may be taken to support the research and writing (not to duplicate Engineering 102S). These units are beyond the normal Civil Engineering or Environmental Engineering program requirements.

GRADUATE PROGRAMS

The University requirements governing the M.S., Engineer, and Ph.D. are described in the "Graduate Degrees" section of this bulletin.

Admission—Applications require submission of the application form, statement of purpose, three letters of recommendation, results of the General Section of the Graduate Record Examination, and transcripts of courses taken at colleges and universities. Policies for each of the department's programs are available from the Department of Civil and Environmental Engineering. Successful applicants are advised as to the degree and program for which they are admitted. If students wish to shift from one program to another after being accepted, an application for transfer must be filed with the department, and they are advised if the transfer is possible. If, after enrollment at Stanford, students wish to continue toward a degree beyond the one for which they were originally admit-
Financial Assistance—The department maintains a large and continuing program of financial aid for graduate students. Applications for financial aid and assistantships should be filed by January 1; it is important that Graduate Record Examination scores be available at that time.

Teaching assistantships carry stipends for as much as one-half time work to assist with course offerings during the academic year. Research assistantships also are available. Engineer and Ph.D. candidates may be able to use research results as a basis for the thesis or dissertation. Assistantships and other basic support may be supplemented by fellowship and scholarship awards or loans. Continued support is generally provided for further study toward the Engineer or Ph.D. degree based on the student’s performance, the availability of research funds, and requisite staffing of current projects.

MAJOR OF SCIENCE

Programs are available leading to the M.S. degree in Civil and Environmental Engineering with the following special field designations on the diploma: Construction Engineering and Management, Design/Construction Integration, Environmental Engineering and Science, Environmental Fluid Mechanics and Hydrology, Geomechanics, and Structural Engineering. Detailed statements of the requirements for all master’s degrees and the specific designation may be secured from the Department of Civil and Environmental Engineering.

Students admitted to graduate study with a B.S. in Civil Engineering (or its equivalent) from an accredited curriculum can satisfy the requirements for the M.S. degree in Civil and Environmental Engineering by completing a minimum of three quarters of full tuition registration and a minimum of 45 units of study beyond the B.S. At least 36 of the units must be taken at Stanford. A minimum 2.75 grade point average (GPA) is required for candidates to be recommended for the M.S. degree. No thesis normally should be started in the first quarter of graduate study after completing, in residence, 45 or more units of work (three quarters minimum) including an acceptable thesis (12 to 15 units) and maintaining a ‘B’ GPA average (3.0) or higher. The program of study must be approved by a faculty member in the department.

The program of study must be approved by the faculty of the department and should include at least 45 units of courses in engineering, mathematics, science, and related fields unless it can be shown that other work is pertinent to the student’s objectives.

Candidates for the M.S. in Civil and Environmental Engineering who do not have a B.S. in Civil Engineering may, in addition to the above, be required to complete those undergraduate courses deemed important to their graduate programs. In such cases, more than three quarters of residence is often required to obtain the degree.

ENGINEER

A student with an M.S. in Civil Engineering may satisfy the requirements of the degree of Engineer in Civil and Environmental Engineering by completing, in residence, 45 or more units of work (three quarters minimum) including an acceptable thesis (12 to 15 units) and maintaining a ‘B’ GPA average (3.0) or higher. The program of study must be approved by a faculty member in the department.

This degree is recommended for those desiring additional graduate education, especially those planning a career in professional practice. The thesis normally should be started in the first quarter of graduate study after the M.S. degree. Programs are offered in the fields of specialization mentioned for the M.S. degree.

DOCTOR OF PHILOSOPHY

The Ph.D. is offered under the general regulations of the University as set forth in the “Graduate Degrees” section of this bulletin. This degree is recommended for those who expect to engage in a professional career in research, teaching, or technical work of an advanced nature. The Ph.D. program is rigorous and should be undertaken only by students with ability for independent work. It requires a minimum of three years (nine quarters) of graduate study, at least two years of which must be at Stanford and a minimum GPA of 3.0 in post-MS course work. Experience has shown that few students complete the Ph.D. within the minimum residence period. Prospective doctoral students should anticipate the possibility of at least one extra year. All candidates for the Ph.D. degree are required to complete CEE 200 in conjunction with a one-quarter teaching assistantship/course assistantship to gain training and instructional experience. Further information about Ph.D. requirements and regulations is found in the department handbook.

The first year of graduate study can be represented by the M.S. program described above. The second year is devoted partly to additional graduate courses and partly to preliminary work toward a dissertation. The third and subsequent years are applied to further course work and to the completion of an acceptable dissertation.

The program of study is arranged by the prospective candidate at the beginning of the second year with the advice of a faculty committee whose members are nearest in the field of interest to that of the student. The chair of the committee serves as the student’s pro tem adviser until such time as a member of the faculty has agreed to direct the dissertation research. Insofar as possible, the program of study is adapted to the interests and needs of the student within the framework of the requirements of the department and the University. In the second year of graduate study, the student is expected to pass the department’s General Qualifying Examination to be admitted to candidacy. After completing their research, students are required to pass the University oral examination, which is a dissertation defense.

Ph.D. MINOR

A Ph.D. minor is a program outside a major department. A minor is not a requirement for any degree, but is available when agreed on by the student and the major and minor departments. Requirements for a minor are established by the minor department. Acceptance of the minor as part of the total Ph.D. program is determined by the major department. Application for candidacy must be approved by both the major and the minor department, and the minor department must be represented at the University oral examination.

A student desiring a Ph.D. minor in Civil and Environmental Engineering (CEE) must have a minor program adviser who is a regular CEE faculty member in the program of the designated subfield. This adviser must be a member of the student’s University oral examination committee and the reading committee for the dissertation.

The program must include at least 20 units of graduate-level course work (that is, courses numbered 200 or above, excluding special studies and thesis) in CEE completed at Stanford University. The list of courses must form a coherent program and must be approved by the minor program adviser and the CEE chair. An average GPA of at least 3.0 must be achieved in these courses.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

UNDERGRADUATE

45Q. Stanford Introductory Seminar: Affordable Housing—A Social Entrepreneurship Start-up—Preference to sophomores. The model of a social entrepreneurship start-up is used to address the social, economic, planning, and design issues that have led to the housing affordability crisis in places like the San Francisco Bay Area. Students become familiar with housing needs, policies, and resources; learn about people most in need of housing; and examine organizations that work in affordable housing. With assistance from professionals, they perform research leading to a business plan for a venture that targets one or more key affordable housing problems selected by the class. Develops skills in organization, research, development of ideas, management, teamwork, presentation, and communication. GER: 3B (DR: 9)

4 units, Spr (Paulson, Behrman)

46Q. Stanford Introductory Seminar: Fail Your Way to Success—Preference to sophomores. Students examine real-world case studies of risk and failure with an emphasis on start-ups and small business risks. The reasons behind these failures and the applications to modern societal and student issues. Emphasis is on the people involved in each example and the lessons learned regarding risk willingness and problem solving.
leadership skills, e.g., the Titanic, Challenger Shuttle, and Hyatt Regency, and case studies from the professor’s 30 years as a small business owner and construction engineer. At least four afternoon field trips to local sites. Prerequisites: creative thinking and problem-solving interests; willingness to visit chaotic construction sites.

3 units, Spr (Clough)

47Q. Stanford Introductory Seminar: Discovering Micro-Organization Theory for Fast-Paced Project Teams—Preference to sophomores. Students discover micro-organization theory for fast-paced projects and learn to manage them by running “virtual experiments” with the Virtual Design Team (VDT) computer model of project organizations. Introduces “information-processing” framework for understanding organizations performing knowledge work. Students work in teams of two to design and execute a series of computational experiments that develop and test hypotheses about the micro-organization theory of fast-paced product development teams. Enrollment limited to 12. Prerequisites: application; curiosity about how organizations work.

4 units, Win (Deierlein)

61Q. Stanford Introductory Dialogue: Big Dams, the City Hall, and the Sierra Club—Preference to sophomores. Water and environmental policy issues: the beneficial and deleterious effects of large hydraulic structures, such as dams and aqueducts; urban infrastructure and the political process; irrigation and its lobby; flood protection; protected species and the environmentalist lobby. How do we balance the conflicting needs of supplying water and protecting from floods with the desire to maintain a livable environment? Changing public perceptions: the glory and shame of big dams. Emphasis is on discussing where we have been and where we are going in the U.S.

2 units, Aut (Kitanidis)

63. Weather and Storms—Survey of daily and severe weather, and global climate. Topics: structure and composition of the atmosphere, fog and cloud formation, rainfall, local winds, global circulation, jet streams, high and low pressure systems, inversions, El Niño, La Niña, atmosphere-ocean interactions, fronts, cyclones, thunderstorms, lightning, tornados, hurricanes, pollutant transport, global climate, and atmospheric optics. GER:2a (DR:5)

3 units, Aut (Jacobson)

64. Air Pollution: From Urban Smog to Global Change—Survey of urban through global-scale air pollution. Topics: the evolution of the earth’s atmosphere, indoor air pollution, urban smog formation, effects of exposure to air pollution, visibility, acid rain, global climate change, stratospheric ozone reduction, Antartic ozone destruction, air pollution transport across political boundaries, the effects of meteorology on air pollution, and the effects of air pollution and stratospheric ozone on human exposure to ultraviolet radiation. GER:2a (DR:5)

3 units, Spr (Jacobson)

70. Environmental Science and Technology—For science and engineering majors. Introduction to environmental quality and the development of the background necessary for understanding environmental issues, controlling environmental degradation, and preserving air and water quality. Material balance concepts for tracking substances in the environment and in engineered systems. Environmental control systems for air and water quality engineering; solid and hazardous waste management and green design; environmental laws that relate to water and air quality and control of hazardous materials; the technical basis for policy and environmental risk.

3 units, Spr (Luthy)

80N. Stanford Introductory Seminar: Structures—Where Form is the Function—Preference to freshmen. What goes into designing the world’s longest bridge or tallest building? The basic principles of structural engineering and structural forms through a series of illustrated case studies. Emphasis is on how various types of structures carry loads and other essentials of good design. Field trip to some landmark structures and a competition to design, build, and test a model bridge.

4 units, Win (Deierlein)


1 unit, Aut, Win, Spr (Monismith)

100. Managing Civil Engineering Projects—Introduction to the facility life cycle and project delivery process and organization. Techniques for planning, organizing, and executing civil engineering projects from conception to completion. Project objectives (scope, quality, cost, time, and safety) from multiple perspectives throughout the facility life cycle. Time and cost planning and control, including scheduling and cost estimating techniques using information technology. Small team projects, exposure to real world projects, and individual paper. (WIM)

4 units, Aut (Haymaker)

101A. Mechanics of Materials—Introduction to beam and column theory. Normal stress and strain in beams under various loading conditions; shear stress and shear flow; deflections of determinate and indeterminate beams; analysis of column buckling; structural loads in design; strength and serviceability criteria. Lab experiments; design project. Prerequisites: 100, Engineering 14.

4 units, Win (Menun)

101B. Mechanics of Fluids—Physical properties of fluids and their effect on flow behavior; equations of motion for incompressible ideal flow, including the special case of hydrostatics; continuity, energy, and momentum principles; control volume analysis; laminar and turbulent flows; internal and external flows in specific engineering applications including pipes, open channels, wind turbines, airplane wings, and baseballs. Prerequisites: Physics 41, Mathematics 51.

4 units, Spr (Monismith)

101C. Geotechnical Engineering—Introduction to the basic principles of soil mechanics. Soil classification, shear strength and stress-strain behavior of soils, consolidation theory, analysis and design of earth retaining structures, introduction to shallow and deep foundation design, slope stability. Lab projects. Prerequisites: Engineering 14. Recommended: 101A.

4 units, Aut (Borja)

101D. Seminar on Mathematical Laboratory Applications in Civil and Environmental Engineering—(Graduate students register for 201D.) Preference to juniors majoring in civil or environmental engineering. Use of commercial professional software in the design and analysis of civil and environmental engineering systems. MATLAB is applied to relevant problems and issues that students encounter in subsequent courses and in engineering practice. Limited enrollment.

2 units, Win (Kitanidis)

101E. Analytical and Numerical Methods for the Environment—(Graduate students register for 201E.) Develops a working knowledge of the analytical and numerical techniques needed to solve a range of environmental problems. Application of these techniques to specific environmental problems. Governing equations plus appropriate boundary and/or initial conditions are derived from the physical contexts. Application of ordinary differential equation methods. Introduction to: method of characteristics, partial differential equation models of physical phenomena and solution of the models, solution of sets of linear and nonlinear equations, modeling of systems with uncertain inputs and data, role of probability. Prerequisites: 101B, 101D, Engineering 155A, or equivalents.

4 units, Aut (Street)

102. Legal Context of Civil Engineering—Introduction to the U.S. legal system as it applies to civil engineering and construction. Fundamental concepts of contract and tort law, claims, risk management,
business formation and licensing, agency, insurance and bonding, and real property.

3 units, Win (London)

111. 3D and 4D Modeling of Civil Engineering Projects—(For undergraduates; same as 211.) Modeling, visualization, and graphical communication of civil engineering artifacts, 3D CAD, 4D modeling, introduction to underlying computer representations, applications of 3D CAD in design and construction, lab exercises, class project.
3 units, Win (Liston)

114. Symbolic Modeling in Engineering—(For undergraduates; same as 214.) Prerequisite: Computer Science 106A or equivalent.
4 units, Win (Kunz)

122A. Computer Integrated Architecture/Engineering/Construction (A/E/C)—Undergraduates serve as apprentices in 222A; see 222A. Enrollment limited and based on interviews.
2 units, Win (Fruchter)

122B. Computer Integrated Architecture/Engineering/Construction (A/E/C)—Undergraduates serve as apprentices in 222B; see 222B. Enrollment limited and based on interviews.
2 units, Spr (Fruchter)

141. Design and Construction of Concrete Canoe for ASCE Competition—Design, construction, and testing of canoe; structural and hydrodynamic analysis; selection of materials and construction methods; participation in regional canoe race.
1 unit, Aut, Win, Spr (Staff)

147. Cases in Personality, Leadership, and Negotiation—Graduate students register for 247; see 247.
3 units, Spr (Clough)

148. Design and Construction of Affordable Housing—Planning, design, engineering, and construction in the development of affordable housing. Topics: the socio-economic context of affordable housing; stages in property development; issues in design; types of structures, methods, and materials used in housing construction; and property management. Students apply what they learn in assignments where they interact with non-profit housing development, city planning officials, and architects. Prerequisites: junior or senior in Civil or Environmental Engineering, Urban Studies, or related fields.
4 units, Win (Paulson)

153. Construction Equipment and Methods—Methods to build projects planned by engineers and architects. Application of engineering fundamentals to the selection and design of equipment and systems to carry out production operations in construction; analysis of production output and costs; application of engineering economy to equipment and process decision making. Prerequisites: 100; Engineering 14, 60.
3 units, Spr (Paulson)

154. Cases in Estimating Costs—Graduate students register for 254; see 254.
3 units, Aut (Clough)

156. Building Systems Design—(Graduate students register for 256.) Design concepts, integration issues, materials of construction, and installation operations for conventional building systems. Lectures and group projects on heating, ventilation, and air conditioning systems. Student groups analyze selected building systems on active projects, and report on existing design, a redesigned portion of a system, materials of construction, and installation.
3 units, Win (Tatum)

160. Mechanics of Fluids Laboratory—Lab experiments/demonstrations illustrate conservation principles and flows of real fluids. Corequisite: 101B.
2 units, Spr (Monismith)

161. Open Channel and Pipe Flows—Introduction to the movement of water through natural and engineered channels, rivers, and pipe systems. Basic equations and theory (mass, momentum, and energy equations) for steady and unsteady descriptions of the flow. Discussion of theory and practice for the choice of pumps and the design of pumping systems. Application of theory to the design of flood-control and water-supply systems. Case studies dealing with flood-control issues in Palo Alto. Lab experiments illustrate concepts developed in class. Prerequisites: 101B, 160. Corequisite 101E.
4 units, Aut (Fong)

162. Hydrology and Water Resources—Introduction to the movement of water through natural and constructed environments. Storage and fluxes of water through the natural environment. Hydrologic processes, including precipitation, evaporation, transpiration, snowmelt, infiltration, subsurface flow, runoff, and streamflow. Emphasis is on measurement, data analysis, modeling, and the role of hydrologic processes in ecosystems. Technological systems associated with human use of water as a resource. Irrigation, hydroelectric power generation, rural and urban water supply systems, stormwater management, flood damage mitigation, water law and institutions. Emphasis is on engineering design and environmental impacts. Required field trips. Prerequisites: 161, Engineering 60.
4 units, Win (Freyberg)

164. Introduction to Physical Oceanography—(Same as Earth Systems 164.) Introduction to the dynamical basis of physical oceanography. Topics: a general description of the physical environment of the ocean; conservation equations for salt, heat, and momentum; geostrophic flows; wind-driven flows; the Gulf Stream; equatorial dynamics and ENSO; the thermohaline circulation of the deep oceans; and tides. Prerequisite: Physics 41.
4 units, Aut (Monismith)

169. Environmental and Water Studies Design—Seniors in Civil or Environmental Engineering only; alternates with 179B. The design of environmental and water resources systems. Design as a process. Application of fluid mechanics, hydrology, water resources, environmental sciences, planning, and engineering economy fundamentals to the design of an engineering system addressing a complex problem of water in the natural and constructed environment. The problem changes each time, generally drawn from a challenge confronting the University or a local community. Previous problems have included sediment management in Searsville Lake, improved operation of Lagunita, and a remedial design for the Santa Rosa outfall in San Pablo Bay. Student design teams prepare proposals, progress reports, oral presentations, and a final design report. Prerequisite: 162.
5 units, alternate years, given 2001-02

171. Environmental Planning Methods—For juniors and seniors. Use of microeconomics and mathematical optimization theory in the design of environmental regulatory programs; tradeoffs between equity and efficiency in designing regulations; techniques for predicting visual, noise, and traffic impacts in environmental impact assessments. Prerequisites: 70, Mathematics 51.
3 units, Win (Ortolano)

172. Air Quality Management—Quantitative introduction to the engineering methods used to study and seek solutions to current air quality problems. Topics: global atmospheric changes, urban sources of air pollution, indoor air quality problems, design and efficiencies of pollution control devices, and engineering strategies for managing air quality. Prerequisites: 70, Mathematics 51.
3 units, Win (Hildemann)
173A. Energy Resources—(Formerly Petroleum Engineering 103; same as Earth Systems 103.) Overview of oil, natural gas, coal, nuclear, hydro, solar, geothermal, biomass, wind, and ocean energy resources in terms of supply, distribution, recovery and conversion, environmental impacts, economies, policy, and technology. The opportunities for energy efficiency, electric power basics, the changing role of electric utilities, transportation basics, and energy use in developing countries. Field trips. Recommended: 70.
4 units, Aut (Woodward)

173B. Seminar: The Coming Energy—(Formerly Petroleum Engineering 104; graduate students register for 207.) The three forces driving an energy revolution: environmental pressures, global social and economic revolution, and technological change. Assessment of evolution vs. revolution, developed vs. developing countries, transportation, electric power, resource development and extraction, end use technologies, deregulation, privatization and globalization, barriers to change, and assessment of the mechanisms to overcome them. Enrollment limited to 15; presentations every class. Prerequisite: 173A.
3 units (Woodward) alternate years, given 2001-02

5 units, Spr (Goulder)

4 units, Win (Masters) alternate years not given 2001-02

176B. Electric Power: Renewables and Efficiency—Electric utility systems: generation, transmission, distribution, regulation, and power quality. Emphasis is on photovoltaics, wind turbines, and fuel cells on the supply side, and efficient lighting systems and electric motors on the demand side. Lab.
4 units (Masters) alternate years, given 2001-02

177. Aquatic Chemistry and Biology—Undergraduate-level introduction to the chemical and biological processes in the aquatic environment. Basic aqueous equilibria; the structure, behavior, and fate of major classes of chemicals that dissolve in water; redox reactions; the biochemical exposure to toxic chemicals in the environment. Pollutant behavior, inhalation exposure, dermal exposure, and assessment tools. Overview of the complexities; uncertainties; and physical, chemical and biological issues relevant to risk assessment. Lab projects. Prerequisite: Mathematics 51. Recommended: 172.
3 units, Spr (Leckie)

178. Introduction to Human Exposure Analysis—(Graduate students register for 276.) Scientific and engineering issues involved in quantifying human exposure to toxic chemicals in the environment. Pollutant behavior, inhalation exposure, dermal exposure, and assessment tools. Overview of the complexities; uncertainties; and physical, chemical and biological issues relevant to risk assessment. Lab projects. Prerequisite: Mathematics 51. Recommended: 172.
3 units, Spr (Leckie)

179A. Water Chemistry Laboratory—(Same as 273A.) For undergraduates. Laboratory application of techniques for the analysis of natural and contaminated waters, emphasizing instrumental techniques.
2 units, Win (Leckie)

179B. Process Design for Environmental Biotechnology—Alternates with 169. Preference given to juniors and seniors in Civil or Environmental Engineering. The design of a water or wastewater treatment system using biological processes to remove contaminants. Student teams characterize contaminants in water or wastewater, design and operate bench- and pilot-scale units, then develop a full-scale design. Limited enrollment. Prerequisites: 177, 179A.
3 units, Spr (Criddle), alternate years, not given 2001-02

180. Structural Analysis—(Formerly 180A.) Analysis of beams, trusses, frames; method of indeterminate analysis by consistent displacement, least work, superposition equations, moment distribution. Introduction to matrix methods and computer methods of structural analysis. Prerequisite: 101A.
4 units, Aut (Kiremidjian)

181. Design of Steel Structures—Concepts of the design of steel structures with a load and resistance factor design (LRFDFD) approach; types of loading; structural systems; design of tension members, compression members, beams, beam-columns, and connections; and design of trusses and frames. Comprehensive project on the structural design of an industrial building. Prerequisite: 180.
4 units, Win (Low)

182. Design of Reinforced Concrete Structures—Properties of concrete and reinforcing steel; behavior of structural elements subject to bending moments, shear forces, torsion, axial loads, and combined actions; design of beams, slabs, columns and footings; strength design and serviceability requirements; design of simple structural systems for buildings. Comprehensive project on the structural design of a reinforced concrete office building. Prerequisite: 180.
4 units, Spr (Krawinkler)

185. Structural Geology and Rock Mechanics—(Same as Geological and Environmental Sciences 111.) Observational techniques, analysis methods, and theoretical foundations of structural geology, engineering geology, and rock mechanics. Computer exercises are integrated with field data to understand the role of geologic structures in the evolution of the earth's crust (folding, faulting, flow, and fracturing of rock) and geologic hazards (earthquakes, landslides, and volcanoes). Topics: structural quantities and dimensional analysis; use of stress, strain, displacement, and velocity fields in structural analysis; the concept and measurement of deformation; mechanical properties of rock (elasticity, viscosity, strength, friction, fracture toughness); case studies of typical geologic structures using continuum mechanics. Computer labs. Prerequisites: Geological and Environmental Sciences 1, calculus, Macintosh skills.
5 units, Aut (Pollard)

186. Engineering Geology Practice—(Same as Geological and Environmental Sciences 115.) The application of geologic fundamentals to the planning and design of civil engineering projects. Emphasis is on development of geologic skills to identify, describe, and map earth materials and geologic structures as a means of determining the impact on site development. Topics: weathering and soil-forming processes, soil and rock mechanics, site investigation techniques, surface and groundwater regimes, stream and coastal processes, quaternary teconics, deposits and geomorphology, environmental concerns, and geologic and geotechnical hazards. Field/lab exercises and case history studies emphasize the impact of site geology on the safety, design, and construction of civil engineering projects such as foundations, transportation facilities, excavations, tunnels and underground storage space, water supply facilities, and marine works. Prerequisite: 195 or consent of instructor.
3 units (Holzer) alternate years, not given 2001-02

197. Professional Development Seminar—Weekly presentations by practicing engineers on topics relevant to students planning to enter the engineering profession. Environmental, structural, and construction perspectives.
1 unit, Win (Tatum)

199. Undergraduate Research in Civil and Environmental Engineering—Participation in a research project in Civil and Environmental
Engineering. Written report or oral presentation required. Students must obtain a faculty sponsor.

2-3 units, any quarter (Staff)

PRIMARILY FOR GRADUATE STUDENTS

200A,B,C. Teaching of Civil and Environmental Engineering—Required of all CEE Ph.D. students. Strategies for effective teaching and introduction to engineering pedagogy. Topics: problem solving techniques and learning styles, individual and group instruction, the role of TAs, balancing other demands, grading. Teaching exercises. Register for quarter of teaching assistantship.

200A. 1 unit, Aut (Staff)
200B. 1 unit, Win (Staff)
200C. 1 unit, Spr (Staff)

201D. Seminar on Mathematical Laboratory Applications in Civil and Environmental Engineering—Undergraduates register in 101D; see 101D.

2 units, Win (Kitanidis)

201E. Analytical and Numerical Methods for the Environment—Undergraduates register for 101E; see 101E.

4 units, Aut (Street)

203. Probabilistic Models in Civil Engineering—Introduction to probability modeling and statistical analysis in civil engineering. Emphasis is on the practical issues of model selection, interpretation, and calibration. Recognition of intrinsic randomness and modeling uncertainty. Introduction to probability event and decision trees. Models of independent events; hazard rate models. Introduction to computational methods including Monte Carlo simulation and second-moment and full-distribution methods derived from structural reliability theory.

3-4 units, Aut (Menun)


3-4 units (Menun) alternate years, given 2001-02

207. Seminar: The Coming Energy Revolution—Undergraduates register for 173B; see 173B.

3 units, Woodward, alternate years, given 2001-02

211. 3D and 4D Modeling of Civil Engineering Projects—Undergraduates register for 111.) See 111.

3 units, Win (Liston)

214. Symbolic Modeling in Engineering—(Same as 114.) Issues concerning symbolic model-based reasoning systems in engineering. Lab to study and create symbolic models using Artifical Intelligence representation and reasoning techniques, and engineering principles and heuristics. Prerequisite: Computer Science 106A or equivalent.

4 units, Win (Kunz)

215. Social Entrepreneurship—(Same as Business 369S.) The efforts of private citizens to create effective responses to social needs and innovative solutions to social problems. Social entrepreneurs are increasingly blurring lines between the sectors, using for-profit and hybrid forms of organization to achieve social objectives. This creates new opportunities for applying business skills in the social sector. Objectives; introduce the concepts, practices, and challenges of social entrepreneurship in the U.S. and the world; provide frameworks and tools to become effective in their socially entrepreneurial pursuits; and engage students in a joint learning process.

4 units, Spr (Dees)

221. Project-Based Design/Construction Integration—Using examples from current construction projects in the Bay Area, students develop an understanding of the goals and concerns of each stakeholder in the facility development process. Emphasis is on the development of skills to identify, describe, and document important design and construction aspects of various types of projects. Integration issues are identified and discussed. Required construction field trips.

2 units, Aut (Miranda)

222A. Computer Integrated Architecture/Engineering/Construction (A/E/C)—Multi-disciplinary, collaborative, multi-site teamwork project environment. Round table A/E/C panel discussions, lectures, and labs on collaborative technologies provide a global perspective of the A/E/C industry and cutting edge information technologies. Students exercise the acquired theoretical discipline knowledge and the information technologies in a multi-disciplinary, collaborative context, and engage in hands-on case study projects to redesign parts of existing projects and work on the concept development phase of the comprehensive course project.

3 units, Win (Fruchter)

222B. Computer Integrated Architecture/Engineering/Construction (A/E/C)—Continuation of 222A. Students focus on the comprehensive team project, including project development and documentation, and final presentation of results. Design and construction alternatives are subject to rigorous examination by rapid computational prototyping, concurrent multi-disciplinary evaluation, and trade-off analysis. Prerequisite: 222A.

2 units, Spr (Fruchter)

223. Issues in Design/Construction Integration—The impact of design decisions on construction, with emphasis on integration issues. Topics: analysis of various delivery project alternatives; design and constructability of steel and concrete structural connections; design and detailing of penetrations through structural members required by various building systems, loads during construction and their possible impact on design, and examples of challenging erection problems. Required construction field trips.

3 units, Spr (Miranda)

237. Introduction to Biotechnology—(Same as Biochemistry 237, Chemical Engineering 450, Developmental Biology 237, Structural Biology 237.) Faculty from the departments of Biochemistry, Biological Sciences, Chemical Engineering, Civil and Environmental Engineering, Developmental Biology, Structural Biology, and invited industrial speakers review the interrelated elements of modern biotechnology. Topics: protein structure and dynamics, protein engineering, biocatalysis, gene expression, cellular metabolism and metabolic engineering, fermentation technology, and purification of biomolecules. Prerequisite: graduate student or upper-division undergraduate in the sciences or engineering.

3 units, Spr (Robertson, Swartz)

238. Frontiers in Interdisciplinary Biosciences—(Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible.) Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford’s Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

2 units, Aut, Win, Spr (S. Block)
258B. 1 unit, Win (Paulson)
258C. 1 unit, Spr (Levitt)

259A, B, C. Construction Problems—Analysis of group-selected problems in construction techniques, equipment, or management, followed by preparation of oral and/or written reports. Students consult specialists from the construction industry and make use of University facilities. See 299 for alternative individual studies. Prerequisites: graduate standing in construction and consent of instructor.

259A. 1-3 units, Aut (Staff)
259B. 1-3 units, Win (Staff)
259C. 1-3 units, Spr (Staff)

260A. Physical Hydrogeology—(Same as Geological and Environmental Sciences 230.) Theory of underground water, analysis of field data and pumping tests, geologic groundwater environments, solution of field problems, groundwater modeling. Introduction to groundwater contaminant transport and unsaturated flow. Lab. Prerequisite: elementary calculus.

3-4 units, Aut (Gorelick)
3-4 units, Win (Staff)


4 units (Loague) alternate years, given 2001-02

260C. Contaminant Hydrogeology—(Same as Geological and Environmental Sciences 231.) For earth scientists and engineers interested in environmental and water resource problems involving contaminated groundwater. The processes affecting contaminant migration through porous media, including interactions between dissolved substances and solid media. Conceptual and quantitative treatments of advective-dispersive transport with reacting solutes. Predictive models of contaminant behavior controlled by local equilibrium and kinetics. Modern methods of contaminant transport simulation and optimal aquifer remediation. Recommended: 260A.

4 units, Spr (Gorelick)

261. Watershed and Wetlands Hydrology—Graduate seminar focusing on the hydrologic processes underlying the functioning, management, and restoration of important ecosystems. Possible topics: the hydrology of tidal salt and freshwater marshes, inland freshwater wetlands, riparian zones, wetland and upland forests, agricultural or urban watersheds. Readings from texts and journal literature. Each student prepares a research proposal on the quarter’s topic. Enrollment limited. Prerequisite: consent of instructor. Recommended: 162, 260A, or equivalents.

3 units, Spr (Freyberg)

262A. Environmental Fluid Mechanics—The flow of incompressible viscous fluid; emphasis is on developing an understanding of fluid dynamics that can be applied to environmental flows. Topics: kinematics of fluid flow; equations of mass and momentum conservation (including density variations); some exact solutions to the Navier-Stokes equations; appropriate analysis of fluid flows including Stokes flows, potential flows, and laminar boundary layers; and an introduction to the effects of rotation and stratification through scaling analysis of fluid flows. Prerequisites: 101B or consent of instructor, and some knowledge of vector calculus.

3-4 units, Aut (Kossov)


3-4 units, Win (Staff)

262C. Modeling Environmental Flows—Introduction to turbulence models, and to basic concepts of numerical simulation and computer modeling of turbulent flows. Application of models to open channel, estuary, and lake/reservoir simulations. Use of computer models for estuarine hydrodynamics, lake/reservoir dynamics, and stream water quality. The effects of rotation and stratification. Prerequisites: 262A, or consent of instructor.

3-4 units, Spr (Street)

263A. Air Pollution Modeling—Introduction to the numerical modeling of urban, regional, and global air pollution with a focus on gas chemistry and radiative transfer. Stratospheric, free-tropospheric, and urban chemistry. Methods for solving stiff systems of chemical ordinary differential, including the Multistep Implicit-Explicit method, Gear’s method with sparse-matrix techniques, and the family method. Numerical methods of solving radiative transfer, coagulation, condensation, and chemical equilibrium problems. Project involves the development of a basic chemical ordinary differential equation solver. Prerequisite: Computer Science 106A or equivalent.

3-4 units, Win (Jacobson)

263B. Numerical Weather Prediction—Introduction to numerical weather prediction. Continuity equations for air and water vapor, the thermodynamic energy equation, and momentum equations are derived for the atmosphere. Numerical methods of solving partial differential equations, including finite-difference, finite-element, semi-Lagrangian, and pseudospectral methods. Time-stepping schemes: the forward-Euler, backward-Euler, Crank-Nicolson, Heun, Matsuno, leapfrog, and Adams-Bashforth schemes. Boundary-layer turbulence parameterizations, soil moisture, and cloud modeling. Project developing a basic mesoscale model. Prerequisite: Computer Science 106A or equivalent.

3-4 units (Jacobson) given 2001-02

263C. Weather and Storms—Undergraduates register for 63; see 63. 3 units, Aut (Jacobson)

263D. Air Pollution: From Urban Smog to Global Change—Undergraduates register for 64; see 64. 3 units, Spr (Jacobson)

263S. Climate Theory, Modeling, Applications, and Implications—Enroll in Biological Sciences 217.

3 units (Schneider) alternate years, given 2001-02

264. Sediment Transport Modeling—The physical processes and modeling of sediment transport in estuaries, rivers, and coastal zones. Modeling in one-, two-, and three-space dimensions and time. Hands-on sessions with actual development, modification, and application of analytical models and numerical codes for transport. Prerequisites: 201D, 262A, or equivalents.

3 units, Win (Street)

265. Sustainable Water Resources Development—Alternative criteria for judging the sustainability of projects. Application of criteria to evaluate sustainability of water resources projects in several countries. Case studies illustrate the role of political, social, economic, and environmental factors in decision making. Evaluation of benefit-cost analysis and environmental impact assessment as techniques for enhancing the sustainability of future projects. Limited enrollment. Prerequisite: graduate standing in Environmental and Water Studies, or consent of instructor.

3 units, Win (Ortolano)
266. Environmental Policy Design and Implementation—Regulation, market incentives, the courts, and negotiation as bases for environmental management programs. Case studies involve implementation of air and water pollution control laws, hazardous waste management programs, and environment impact assessment. Limited enrollment. Prerequisite: graduate standing in Environmental and Water Studies Program or consent of instructor.

4 units (Ortolano) given 2001-02

267. Interpolation and Inverse Problems—Understanding complex hydrologic processes by using measurements, mathematical models which describe groundwater flow and solute transport, and stochastic analysis of spatial variability and uncertainty. Topics: exploratory data analysis, generalized linear minimum-variance estimation, parameter estimation (or “model calibration”), model validation, accuracy of model predictions, optimal sampling. Emphasis is on linear “geostatistical” methods of estimation. Prerequisite: background in introductory statistics and linear algebra.

3-4 units, Spr (Kitanidis)

268. Groundwater Flow—Study of flow and mass transport in porous media through analytical techniques. Applications of potential flow theory to practical groundwater problems: flow to and from wells, rivers, lakes, drainage ditches; flow through and under dams; streamline tracing; capture zones of wells; and mixing schemes for in-situ remediation. Prerequisites: calculus and introductory fluid mechanics.

3-4 units, Win (Kitanidis)

269. Water Resources Seminar—Problems in all branches of water resources, with talks by visitors, faculty, and students. (AU)

1 unit, Spr (Kitanidis)

270. Movement, Fate, and Effects of Contaminants in Surface Waters and Groundwater—Transport of chemical constituents in surface and groundwater, including advection, dispersion, sorption, interphase mass transfer, and transformation; water quality requirements for various beneficial uses. Emphasis is on the behavior of hazardous waste contaminants. Prerequisites: undergraduate chemistry and calculus. Recommended: 101B.

3 units, Aut (Luthy)


3 units, Win (Luthy)

271B. Environmental Biotechnology—Stoichiometry, kinetics, and thermodynamics of microbial processes for the transformation of environmental contaminants. Design of dispersed growth and biofilm-based processes. Applications include treatment of municipal and industrial wastewaters, detoxification of hazardous chemicals, and groundwater remediation. Prerequisites: 270, 177 or 274A (or equivalents).

4 units, Win (Cridde)

271C. Physiochemical Processes and Organic Contaminants—The major physical and chemical processes affecting anthropogenic organic compounds in aquatic systems. Review of concepts from physical organic chemistry and the relationships between chemical structure and physicochemical properties and the environmental behavior of organic compounds. The physicochemical processes important to phase partitioning, availability, transport, treatment, and abiotic transformation of specific organic compounds are addressed and applied to examples in water quality engineering, and soil and sediment quality. Prerequisite: 270.

3 units (Luthy) not given 2000-01

272. Aquatic Chemistry—(Same as Geological and Environmental Sciences 264.) Chemical principles and their application to the analysis and solution of problems in aqueous geochemistry (temperatures near 25°C and atmospheric pressure). Emphasis is on the analysis of natural water systems and the understanding and solution of specific chemical problems in water purification technology and water pollution control. Prerequisites: Chemistry 31 and 33, or equivalents.

3 units, Aut (Leckie)

273A. Water Chemistry Laboratory—Laboratory application of techniques for the analysis of natural and contaminated waters, emphasizing instrumental techniques.

2 units, Win (Leckie)


3 units, Aut (Spormann)


3 units, Win (Spormann)

274C. Environmental Microbiology Laboratory—Microbiological, biochemical, and molecular techniques for characterizing microbes: enrichment and isolation of microorganisms, metabolic and phylogenetic characterization of isolates, determination of growth parameters (growth rate, growth yield, fermentation balance), enrichment and isolation of microorganisms degrading pollutants, detection of microorganisms in the environment, water quality parameters. Horizontal gene transfer. Prerequisites: 274A, 274B.

3 units (Spormann)

274D. Pathogens and Disinfection—Introduction to epidemiology, major pathogens and infectious diseases, the immune system, movement and survival of pathogens in the environment, transfer of virulence and antibiotic resistance genes, and pathogen control, with an emphasis on public health engineering measures (disinfection). Prerequisite: 274A.

3 units (Cridde) not given 2000-01

275A. Water Quality Control Processes I—Lab and pilot plant studies of the physical and chemical processes for the treatment of water and wastewaters. Prerequisites: 271A, 273, 273A.

3 units (Leckie) alternate years, given 2001-02

275B. Environmental Biotechnology Laboratory—Design of a water or wastewater treatment system using biological processes to remove contaminants. Student teams characterize contaminants in water or wastewater, design and operate bench- and pilot-scale units, then develop a full-scale design. Prerequisites: 271B, 273A.

3 units, Spr (Cridde) alternate years, not given 2001-02
3 units, Spr (Deierlein)

3 units, Aut (Hildemann)

3 units, Spr (Hildemann)

279. Environmental Engineering Seminar—Current research, practice, and thinking in environmental engineering and science. Attendance at seminars is self-directed, and may be accrued throughout the school year. See instructor for syllabus.
1 unit, Spr (Leckie)

280. Advanced Structural Analysis—Theoretical development and computer implementation of direct stiffness method of structural analysis; virtual work principles; computation of element stiffness matrices and load vectors; direct assembly procedures; equation solution techniques. Analysis of two- and three-dimensional truss and frame structures, thermal loads, and substructuring and condensation techniques for large systems. Practical modeling techniques and programming assignments. Introduction to nonlinear analysis concepts. Prerequisites: elementary structural analysis and matrix algebra.
3-4 units, Aut (Deierlein)

281. Finite Element Structural Analysis—Introduction to the finite element method for analysis of structural systems. Formulation and implementation of frame, plane stress, plane strain, axisymmetric, torsional, solid, plate, and shell elements. Topics: strong and weak forms of the problem, variational principles and the principle of minimum potential energy, the finite element method as an extension of the Rayleigh-Ritz method, shape functions, isoparametric mapping, numerical integration, convergence requirements, and error estimation. Techniques for application to modeling structural systems. Prerequisite: 280 or equivalent.
3-4 units, Win (Lowes)

282. Nonlinear Structural Analysis—(Formerly 283.) Introduction to methods of geometric and material nonlinear analysis, emphasizing modeling approaches for framed structures. Large-displacement analysis, concentrated and distributed plasticity models, and nonlinear solution methods. Applications to frame stability and performance-based seismic design. Assignments emphasize computer implementation and applications. Prerequisites: 280, 286 or equivalent.
3 units, Spr (Deierlein)

283. Structural Dynamics—(Formerly 296A.) Vibrations and dynamic response of simple structures under time dependent loads, dynamic analysis of single and multiple degrees of freedom systems, support motion, response spectra.
3-4 units, Aut (Law)

284. Computational Methods in Structural Dynamics—Methods of structural dynamics for discretized and continuous systems in free and forced vibration, modal analysis; numerical methods; introduction to nonlinear dynamics; advanced topics. Prerequisites: 280, 283.
3 units (Law) alternate years, given 2001-02

285. Behavior of Structural Systems for Buildings—Basic design concepts, performance criteria, loading, methods of design, types of structural systems behavior under gravity and lateral loads, approximate methods of analysis, preliminary design concepts and implementation, performance assessment, behavior of structural elements. Prerequisites: basic courses in design of steel and reinforced concrete structures.
3-4 units, Aut (Krawinkler)

286. Advanced Structural Design—Strength, stiffness, and ductility considerations in the design of structural elements and systems made of steel, reinforced concrete, and other materials. Concepts of redistribution (element vs. system behavior). Introduction to performance-based design. Prerequisites: basic courses in design of steel and reinforced concrete structures, 285 or equivalent.
3-4 units, Win (Krawinkler)

287. Earthquake Resistant Design—(Formerly 284). Earthquake motions and their engineering interpretations, design spectrum and design earthquakes, dynamic analysis of structures for earthquake loading, design of structures to minimize earthquake damage, design of protective systems, retrofit of existing structures, earthquake codes. Prerequisite: 286 or consent of instructor.
3 units, Spr (Lowes)

288. Earthquake Hazard and Risk Analysis—(Formerly 282.) Earthquake phenomena, faulting, ground motion, study of past major earthquakes, effects of earthquakes on man-made structures, response spectra, Fourier spectra, power spectra, random vibration analysis of single and multi-degree of freedom systems, soil effects on ground motion and structural damage, methods for structural damage evaluation, current research in earthquake engineering. Prerequisites: 203, 283.
3 units, Win (Staff)

3-4 units, Spr (Menun) alternate years, not given 2001-02

290. Structural Performance and Failures—(Formerly 287.) Basic concepts in the definition of satisfactory structural performance; key elements in structural performance; types of failures, ranging from reduced serviceability to total collapse; failure sources and their root cause allocation, emphasizing design/construction process failures; failure prevention mechanisms; illustration with real life examples.
2 units, Spr (Moncarz)

291. Advanced Strength of Materials and Laboratory Testing—Experimental investigation and analytical modeling of new and tradi-
tional civil engineering materials. Laboratory testing to determine strength, deformation, and energy-dissipation characteristics. Review mechanics of materials, introduction to inelastic constitutive theory including plasticity theory, damage mechanics, fracture mechanics, viscoelasticity, and viscoplasticity. Readings from texts and journal literature. Possible topics: plain concrete, fiber-reinforced concrete, structural steel, fiber-reinforced composites, rubber and asphalt. Student paper discussing constitutive modeling.

3 units, Aut (Lowes)

292. Computer Methods in Structural Engineering—Introduction to basic techniques for the development of structural engineering analysis and design software. Topics: basic data structure; computer representation of engineering systems; implementation of advanced numerical methods and engineering software; automated conformance checking of design codes and standards. Prerequisites: Computer Science 106A or equivalent.

3 units, Win (Law) alternate years, not given 2001-02

293. Foundation Engineering—(Formerly 291.) Types, characteristics, analysis, and design of shallow and deep foundations; rigid and flexible retaining walls; braced excavations; settlement of footings in sands and clays; slope stability analysis by method of slices including search algorithms for the critical slip surface. Special seminars by guest speakers; computing assignment. Prerequisite: 101C or equivalent.

3 units, Win (Borja)


3 units (Borja) alternate years, given 2001-02

295. Plasticity in Geomechanics—(Formerly 290.) Theory of particulate media; micromechanics of granular materials; constitutive laws in geomechanics; plasticity; return-mapping algorithms; classical yield models. Mises, Mohr-Coulomb, Drucker-Prager; critical state theory and Cam-clay models; multi-surface and bounding surface models; localization and bifurcation theories in geomechanics. Prerequisites: 101C, Mechanical Engineering 238A, or equivalent.

3 units, Spr (Borja) alternate years, not given 2001-02

296. Experimental Soil Mechanics—(Formerly 293.) Lab determination of stress-strain-strength parameters for soils under drained and undrained loading conditions. Six lab experiments. Prerequisite: 101C or equivalent.

2 units, Win (Borja)

297. Issues in Geotechnical and Environmental Failures—(Formerly 294.) Causes and consequences of the failure of buildings, earth structures, waste storage, and high hazard facilities in contact with the environment; technical, ethical, economic, legal, and business aspects; failure analysis and forensic problems; prevention, liability, and dispute management. Case history approach based on the instructor's files including earthquake, flood, and hazardous waste facilities. Student observation, participation in active lawsuits where possible.

3 units, Spr (Meehan)

298. Structural Engineering and Geomechanics Seminar—Recommended for all graduate students. Lectures on topics of current interest in professional practice and research. (AU)

1 unit, Win (Staff)

299. Independent Study in Civil and Environmental Engineering—Directed study for graduate students on subjects of mutual interest to students and faculty. Student must obtain faculty sponsor.

1-3 units, any quarter (Staff)

300. Thesis—Investigation of an engineering problem; required of candidates for degree of Engineer.

Aut, Win, Spr (Staff)

310. Post-Master's Seminar—For post-master's students to serve as orientation to the selection of a research topic.

1 unit, Aut, Win, Spr (Staff)

320A, B, C. Integrated Facility Engineering—Individual and group presentations on goals, research, and state-of-practice of integrated facility engineering, including objectives for integrated computer systems. (AU)

1 unit, Aut, Win, Spr (Kuzn, Levitt)

342. Computational Modelling of Organizations—For post-M.S. students interested in formal techniques for organization design. Computer simulation of organizations is used to conduct "virtual experiments" for developing organization theory or to analyze the performance of "virtual organizations" with different structures and design support/communication technologies. Goals: introduce research on computational modeling and design of real-world organizations. Paper serves as a research proposal. Prerequisite: 242 or equivalent introductory organization design class.

4-5 units, Win (Levitt)

362. Advanced Topics in Subsurface Transport—Mathematical analysis of flow and transport in porous and fractured media. Topics vary each year, including: solution of flow and transport equations, stochastic analysis, homogenization, and estimation methods. Prerequisite: consent of instructor.

3 units (Kitanidis) alternate years, given 2001-02


3 units (Fong) alternate years, given 2001-02

364. Geophysical Fluid Dynamics—Focus is on fluid dynamics in natural systems where the influence of the earth's rotation is important. The basic processes such as geostrophic and quasi-geostrophic flows, planetary waves, and potential vorticity. Student-led lectures and discussions of current physical oceanographic research problems.

1 unit, Win (Monismith, Fong)

370A, B, C. Environmental Research—Introductory research experience for first-year graduate students in the Environmental Engineering and Science program pursuing the Ph.D. 15-18 hrs/week on research over a 3- or 4-yr. period. 370A requires written literature survey on a research topic; 370B requires oral presentation on experimental techniques and research progress; 370C requires written or oral presentation of preliminary doctoral research proposal. Students must obtain a faculty sponsor.

3-6 units, Aut, Win, Spr (Staff)

398. Report on Civil Engineering Training—On-the-job training under the guidance of experienced, on-site supervisors; meets the requirements for Curricular Practical Training for students on F-1 visas. Students submit a concise report detailing work activities, problems worked on, and key results. Prerequisite: written consent of adviser.

1 unit, any quarter (Staff)
**UNDERGRADUATE PROGRAMS**

The department offers both a major and a minor in Computer Science. The requirements for these programs are outlined in the "School of Engineering" section of this bulletin and described in more detail in the Handbook for Undergraduate Engineering Programs published by the School of Engineering. The department has an honors program, which is described in the following section.

In addition to Computer Science itself, Stanford offers several interdisciplinary degrees with a substantial computer science component. The Computer Systems Engineering major (also in Engineering) allows the study of issues of both computer hardware and software, bridging the gap between traditional CS and Electrical Engineering majors. The Symbolic Systems major (in the School of Humanities and Sciences) offers a chance to explore computer science and its relation to linguistics, philosophy, and psychology. Finally, the Mathematical and Computational Sciences major (also Humanities and Sciences) allows students to explore computer science along with more mathematics, statistics, and operations research.

**HONORS**

The Department of Computer Science offers an honors program for selected undergraduates whose academic records and personal initiative indicate that they have the necessary skills to undertake high-quality research in computer science. Admission to the program is by application only. To apply for the honors program, students must be majoring in Computer Science, have a grade point average (GPA) of at least 3.5 in courses that count toward the major, and achieve senior standing (135 or more units) by the end of the academic year in which they apply. Co-terminal master’s students are eligible to apply as long as they have not already received their undergraduate degree. Beyond these requirements, students who apply for the honors program must also find a faculty member who agrees to serve as the thesis adviser for the project. Thesis advisers must be members of Stanford’s Academic Council.

Students who meet the eligibility requirements and wish to be considered for the honors program must submit a written application to the departmental student program office by May 1 of the year preceding the honors work. The application must include a letter describing the research project, a letter of endorsement from the faculty sponsor, and a transcript of courses taken at Stanford. Each year, a faculty review committee will select the successful candidates for honors from the pool of qualified applicants.

In order to receive departmental honors, students admitted to the honors program must, in addition to satisfying the standard requirements for the undergraduate program, do the following:

1. Complete at least 9 units of CS 191 or 191W under the direction of their project sponsor.
2. Enroll in a research seminar, which allows students to share their experience with other students working on research projects.
3. Complete an honors thesis deemed acceptable by a committee consisting of the thesis adviser and at least one additional faculty member.
4. Present the thesis at a public colloquium sponsored by the department.
5. Maintain the 3.5 GPA required for admission to the honors program.

**GRADUATE PROGRAMS**

The University’s basic requirements for the M.S. and Ph.D. degrees are discussed in the "Graduate Degrees" section of this bulletin.

**MASTER OF SCIENCE**

In general, the M.S. degree in Computer Science is intended as a terminal professional degree and does not lead to the Ph.D. degree. Most students planning to obtain the Ph.D. degree should apply directly for admission to the Ph.D. program. Some students, however, may wish to complete the master’s program before deciding whether to pursue the Ph.D. To give such students a greater opportunity to become familiar with research, the department has instituted a new program leading to a mas-
School of Engineering

Requirement 2.
M.S. program committee other coherent programs that meet their goals.

Eight approved programs are listed below. Students may propose to the
program.

A candidate is required to complete a program of 45 units. At least 36
of these must be graded units, passed with an average 3.0 (B) grade point
average (GPA) or better. The 45 units may include no more than 21 units
of courses from those listed below. Requirements 1 and 2. Thus, students
need to take more than seven of the courses listed in Requirements 1 and 2
actually complete more than 45 units of course work in this program. Only extremely well-prepared students may expect to finish the
program in one year; most complete the program in six quarters. Students
hoping to complete the program with 45 units should already have a sub-
stantial background in computer science, including course work or ex-
perience equivalent to all of Requirement 1 and some of the courses in
Requirement 2.

Requirement 1 — The following courses may be needed as prerequi-
sites for other courses in the program: CS 103X, 107, 108; 193L (for
specialization 5 only); Electrical Engineering 182; Mathematics 109 or
120.

Requirement 2 — Students must demonstrate breadth of knowledge
in the field by completing the following courses:

1. Area A: Mathematical and Theoretical Foundations:
   a) Required:
      1) Statistics (Statistics 116 or Management Science and Engineer-
      ing 120)
      2) Algorithms (CS 161)
      3) Automata (CS 154)
   b) Choose one of:
      1) Numerical Analysis (CS 137 or 237A)
      2) Logic (CS 157, 257, 258, or Philosophy 160A)

2. Area B: Computer Systems:
   a) Required: Architecture (Electrical Engineering 182 or 282)
   b) Choose two of:
      1) Operating Systems (CS 140)
      2) Compilers (CS 143)
      3) Introduction to Computer Networks (CS 244A or Electrical
      Engineering 284)

3. Area C: AI and Applications:
   a) Choose two of the following, with at least one 200-level course:
      1) AI (CS 121 or 221)
      2) Databases (CS 145 or 245)
      3) Graphics (CS 148 or 248)

   Individual specializations are free to narrow the set of choices in spe-
cific areas of the breadth requirement; see the individual specialization
sheets in the department office for details. Breadth courses are waived
only if evidence is provided that similar or more advanced courses have
been taken, either at Stanford or another institution. Courses that are
waived rather than taken may not be counted toward the M.S. degree.
Breadth courses may be taken on a Satisfactory/No Credit basis provided
that a minimum of 36 graded units is presented within the 45-unit
program.

Requirement 3 — At least 1 but no more than 3 units of 500-level sem-
inars must be taken.

Requirement 4 — A program of 21 units in an area of specialization
must be completed. All courses in this area must be taken for letter grades.
Eight approved programs are listed below. Students may propose to the
M.S. program committee other coherent programs that meet their goals
and satisfy the basic requirements. Students who want to include a sub-
stantial research project as part of their degree program can arrange with
their adviser to replace units in their specialization with a CS 393 (Com-
puter Laboratory) project.

1. Numerical Analysis/Scientific Computation
   a) CS 237A, 237B, 237C
   b) At least two of: CS 260; Manage. Sci. & Engr. 121; Math.
      131, 132, 220A, 220B, 220C; Stat. 200
   c) At least three of: CS 223A, 238, 326A, 327A, 328, 336, 337,
      339; Aero. & Astro. 214A, 214B; Mech. Engr. 235A, 254;
      Stat. 227

2. Systems
   a) CS 240, 242
   b) At least three of: CS 243, 244A, 245, 248, 348B; Elect. Engr.
      271, 275, 382
   c) At least 6 more units selected from 'b' and from the following:
      CS 194, 214, 244B, 244C, 248V, 249, 255, 315A, 315B, 341,
      342, 343, 344, 345, 346, 347, 348A, 348C, 349, 448; Elect.
      Engr. 183, 272, 281, 318, 319, 374, 384A, 384B, 384C, 482A,
      482B, 487, 488, 489; Psych. 267

3. Software Theory
   a) CS 242, 243, 256, 258
   b) At least one of: CS 244A, 245, 342, 343, 345
   c) At least one course from the following: CS 255, 261, 351,
      355, 356, 361A, 361B, 365, 368
   d) At least one additional course selected from '3b,' '3c,' CS
      346

4. Theoretical Computer Science
   a) CS 256, 258, 261 (361A, 361B, or 365 may be used as substitutes
      for 261)
   b) At least 12 more units from CS 228, 255, 345, 351, 352, 353,
      355, 356, 357, 358, 359*, 361A, 361B, 365, 367A, 367B, 368,
      369*; Manage. Sci. & Engr. 310

5. Artificial Intelligence
   a) At least four of: CS 222, 223A, 223B, 224M, 224N, 227, 228,
      229, 326A
   b) A total of 21 units from the above and from the following:
      CS 205, 206, 225A, 225B, 226, 256, 257, 270A, 271, 274, 323,
      327A, 328, 329, 354, 377, 379, 426

6. Database
   a) CS 245
   b) Two of: CS 345, 346, 347
   c) Four additional courses selected from '6b' and from the
      following: CS 222, 240, 242, 243, 244A, 244B, 244C, 249,
      Elect. Engr. 489

7. Human-Computer Interaction
   a) CS 147, 247A, 247B
   b) At least 6 units from: CS 148 or 248, 377 (may be taken
      repeatedly), 378, 447
   c) A total of 21 units from the above and from the following:
      Comm. 269, 272; CS 249, 270A, 270B, 272, 320, 348A, 348B,
      448; Engr. 145; Manage. Sci. & Engr. 234, 273, 280, 284;
      Linguistics 238; Mech. Engr. 101, 115, 215, 313; Psych. 203,
      205, 221, 266, 267

8. Real-World Computing
   a) At least two of: CS 223A, 223B, 248
   b) At least three of: CS 205, 237A, 237B, 237C, 248V, 249, 270A,
      270B, 271, 272, 326A, 348A, 348B, 368
   c) A total of 21 units from the above and from the following:
      267

* With consent of Specialization chair.

Requirement 5 — Additional elective units must be technical courses
(numbered 100 or above) related to the degree program and approved by
the adviser. Elective courses may be taken on a Satisfactory/No Credit
basis provided that a minimum of 36 graded units are presented within
the 45-unit program.
MASTER OF SCIENCE WITH DISTINCTION IN RESEARCH

A student who wishes to pursue the M.S./CS with distinction in research must first identify a faculty adviser who agrees to supervise and support the research work. The research adviser must be a member of the Academic Council and must hold an appointment in Computer Science. The student and principal adviser must also identify another faculty member, who need not be in the Department of Computer Science, to serve as a secondary adviser and reader for the research report. In addition, the student must complete the following requirements beyond those for the regular M.S./CS degree:

1. **Research Experience:** the program must include significant research experience, at the level of a half-time commitment over the course of three academic quarters. In any given quarter, the half-time research commitment may be satisfied by a 50 percent appointment to a departmentally supported research assistantship, 6 units of independent study (CS 393, 395, or 399), or a prorated combination of the two (such as a 25 percent research assistantship supplemented by 3 units of independent study). This research must be carried out under the direction of the primary or secondary adviser.

2. **Supervised Writing and Research:** in addition to the research experience outlined in the previous requirement, students must enroll in at least 3 units of independent research (CS 393, 395, or 399) under the direction of their primary or secondary adviser. These units should be closely related to the research described in the first requirement, but focused more directly on the preparation of the research report described in the next section. Note that these units must be taken in addition to the 21 units required for the specialization, although they do not count toward the 45 units required for the degree.

3. **Research Report:** students must complete a significant report describing their research and its conclusions. The research report represents work that is publishable in a journal or at a high-quality conference, although it is presumably longer and more expansive in scope than a typical conference paper. Three copies of the research report must be submitted to the Student Services office in the department three weeks before the beginning of the examination period in the student’s final quarter. Both the primary and secondary adviser must approve the research report before the “distinction in research” designation can be conferred.

DOCTOR OF PHILOSOPHY

Applications to the Ph.D. program and all supporting documents must be received before December 15, 2000. The following are department requirements (see the Computer Science graduate programs administrator for further details, or visit www.cs.stanford.edu/admissions):

1. A student should plan and successfully complete a coherent program of study covering the basic areas of computer science and related disciplines. The student’s adviser has primary responsibility for the adequacy of the program, which is subject to review by the Ph.D. program committee.

2. Each student, to remain in the Ph.D. program, must satisfy the breadth requirement covering introductory level graduate material in major areas of computer science. Once a student fulfills six of eight whole areas of the breadth requirement, he or she may apply for admission to candidacy for the Ph.D. This is typically done by the end of the second year in the program. The student must completely satisfy the breadth requirement by the end of nine quarters (excluding summers), and must pass a qualifying exam in the general area of the expected dissertation.

3. As part of the training for the Ph.D., the student is required to complete at least 4 units (a unit is 10 hours per week for one quarter) as a teaching assistant or instructor for courses in Computer Science numbered 100 or above.

4. The most important requirement is the dissertation. After passing the qualifying examination, each student must secure the agreement of a member of the department faculty to act as the dissertation adviser. (In some cases, the dissertation adviser may be in another department.)

5. The student must pass a University oral examination in the form of a defense of the dissertation. It is usually held after all or a substantial portion of the dissertation research has been completed.

6. The student is expected to demonstrate the ability to present scholarly material orally, both in the dissertation defense and by a lecture in a department seminar.

7. The dissertation must be accepted by a reading committee composed of the principal dissertation adviser, a second member from within the department, and a third member chosen from within the University. The principal adviser and at least one of the other committee members must be Academic Council members.

Ph.D. MINOR

For a minor in Computer Science, a candidate must complete 20 units of computer science course work, including at least three of the master’s core courses to provide breadth, and one course numbered 300 to provide depth. The remaining courses must be numbered 200 or above. One of the courses taken must include a significant programming project to demonstrate programming proficiency. A grade point average (GPA) of 3.0 or better must be maintained.

TEACHING AND RESEARCH ASSISTANTSHIPS

Graduate student assistantships are available. Half-time assistants receive a tuition scholarship for 9 units per quarter during the academic year, and in addition receive a monthly stipend.

Duties for half-time assistants during the academic year involve approximately 20 hours of work per week. Teaching assistants (TAs) help an instructor teach a course by conducting discussion sections, consulting with students, grading examinations, and so on. Research assistants (RAs) help faculty and senior staff members with research in computer science. Most teaching and research assistantships are held by Ph.D. students in the Department of Computer Science. If there is an insufficient number of Ph.D. students to staff teaching and research assistantships, then these positions are open to a limited number of master’s students in the department. However, master’s students should not plan on being appointed to an assistantship.

Students with fellowships may have the opportunity to supplement their stipends by serving as graduate student assistants.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirement.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

GUIDE TO SELECTING INTRODUCTORY COURSES

Students arriving at Stanford have widely differing backgrounds and goals, but must find that the ability to use computers effectively is beneficial to their education. The department offers many introductory courses to meet the needs of these students.

For students whose principal interest is an exposure to the fundamental ideas behind computer science and programming, CS 105 is the most appropriate course. It is intended for students in nontechnical disciplines who expect to make some use of computers, but who do not expect to go on to more advanced courses. CS 105 meets the Area 2b General Education Requirement and includes an introduction to programming, and the use of modern Internet-based technologies. Students interested in learning to use the computer should consider CS 1C (Introduction to Computing at Stanford) or 1U (Introduction to Unix).

Students who intend to pursue a serious course of study in computer science may enter the program at a variety of levels, depending on their background. Students with little prior experience or those who wish to take more time to study the fundamentals of programming should take 106A followed by 106B. Students in 106A need not have prior programming experience. Students with significant prior exposure to programming or those who want an intensive introduction to the field should take
106X, which covers most of the material in 106A and B in a single quarter. All instruction in CS 106 uses ANSI C, although the prior programming experience required for 106X may be in any language. In all cases, students are encouraged to discuss their background with the instructors responsible for these courses.

After the introductory sequence, Computer Science majors and those who need a significant background in computer science for related majors in engineering should take 103, 107 and 108. CS 103 offers an introduction to the mathematical and theoretical foundations of computer science. CS 107 exposes students to a variety of programming paradigms that illustrate critical strategies used in systems development; 108 builds on this material, focusing on the development of large interactive programs based on the object-oriented programming paradigm.

In summary:
For exposure—1C or 1U
For nontechnical use—105
For scientific use—106A
For a technical introduction—106A
For significant use—106A,B or 106X, along with 103, 107, and 108

NUMBERING SYSTEM
The first digit of a CS course number indicates its general level of sophistication:
0-99 service courses for nontechnical majors
100-199 other service courses, basic undergraduate
200-299 advanced undergraduate/beginning graduate
300-399 advanced graduate
400-499 experimental
500-599 graduate seminars

The tens digit indicates the area of Computer Science it addresses:
00-09 Introductory, miscellaneous
10-19 Hardware Systems
20-29 Artificial Intelligence
30-39 Numerical Analysis
40-49 Software Systems
50-59 Mathematical Foundations of Computing
60-69 Analysis of Algorithms
70-79 Typography and Computational Models of Language
90-99 Independent Study and Practicum

NONMAJOR

1C. Introduction to Computing at Stanford—For those with limited experience on computers. Introduction to the basics of computing, and a variety of programs, encouraging individual exploration of the programs covered. Topics: word processing, spreadsheets, using the WWW and the Internet, and computing resources at Stanford. Macintosh and PC systems. One-hour lecture/demonstration in dormitory clusters. Weekly short assignments and a final project. Not a programming course.
1 unit, Aut (Staff)

II. The Internet—For a computer-literate but not technical audience. What is the Internet and what is it good for? The foundations, resources, and uses of the Internet, emphasizing practical skills for finding, reading, and authoring Internet material. Topics: HTML, FTP, HTTP, web publishing and searching; evolution and future directions; security and privacy issues. Programming-oriented course is 193I. Prerequisites: basic computer skills at level of 1C, e.g., file editing, and access to a computer on the Internet.
1 unit, Win (Staff)

1U. Introduction to Unix—Tutorial on using the Unix operating system. Topics: text editors, the file system, the C shell, standard Unix utilities, PERL. Includes simple shell programming, but is not a programming course and assumes no prior exposure to programming.
1 unit, Spr (Staff)

50. Problem Solving with Mathematica—For engineers, physicists, mathematicians, and others who need to solve mathematical or quantitative problems. Comprehensive introduction to Mathematica, an interactive mathematical software package that includes a high-level programming language. Symbolic, numerical, graphical, animation, and programming capabilities, including use of Mathematica to manipulate expressions, find roots, solve differential equations, visualize functions and data, import and export data in arbitrary formats, work with expressions in standard mathematical notation, and perform statistical analyses.
2 units (Williams) alternate years, not given 2001-02

51. Introduction to Quantum Computing and Quantum Information Theory—For computer scientists, physicists, mathematicians, engineers, and others who want to learn the capabilities of quantum computers and the necessary quantum mechanics and complexity theory. Topics: quantum algorithms (including Shor's polynomial time algorithm for integer factorization, Grover's database search algorithm, quantum tree search, quantum wavelets), quantum information theory, quantum cryptography, breaking the RSA cryptosystem, quantum teleportation, circuit design, quantum error correction, and examples of prototype quantum computers. Prerequisites: familiarity with elementary matrix algebra and complex numbers.
2 units, Win (Williams)

99A. Stanford Introductory Seminar: The Downside of Computing Systems—Preference to freshmen. Computers are critical components of our world in such tasks as surgery, air traffic control, and international banking. How computing systems fail, how such failures may affect our society in the future, and how to build and maintain systems to avoid failures. Case studies of computer-related disasters, including the Therac-25 accidents, the Internet worm, and the Ariane 5 crash. Topics: computer security, robust distributed systems, fault-tolerant architectures, organizational behavior.
3 units (Baker) not given 2000-01

99C. Stanford Introductory Seminar: Computers—Fact and Fiction—Preference to freshmen. Can a computer be world chess champion? How can it learn to do something it wasn't told to do? Can it create? Even computer scientists have disagreed. Some interesting and/or controversial predictions are compared to the state of the art technology. Things computers have already done, things that they might be able to do, and things that computers cannot do. Possible topics: virtual reality, the world wide web, machine learning, computer game playing, security and cryptography, etc. Prerequisite: basic understanding of how computers work (i.e., how we write programs that tell a computer what to do).
3 units (Koller) not given 2000-01

99D. Stanford Introductory Seminar: The Science of Art—Preference to freshmen. The interwoven histories of science and Western art from the Renaissance to the 19th century. Emphasis is on the revolutions in science and mathematics that have inspired parallel revolutions in the visual arts (e.g., Brunelleschi's invention of linear perspective, Newton's discoveries in geometric optics, and the theories of color vision proposed by Goethe, Young, Helmholtz, etc.). The scientific principles behind computer graphics). GER: 2b (DR: 6)
3 units, Win (Levy)

99E. Stanford Introductory Seminar: Great Ideas in Computer Science—Preference to freshmen. The power and limitations of computers; concrete strategies for solving problems using computers. What can a computer do efficiently? Why are programs hard to test? How can we make computers appear clairvoyant? How do you keep secrets in computers? Should tables be sorted? When is it a good idea to be greedy? These questions involve ideas whose impact ranges from the philosophical foundations of computation to concrete applications in everyday life. Prerequisite: mathematical maturity (e.g., AP Math) and exposure to computer programming.
3 units (Motwani, Raghavan) not given 2000-01

99F. Stanford Introductory Seminar: Paradox—Bug or Feature?—Preference to freshmen. Conflict in thought is as inevitable as in territory

3 units, Win (Pratt)

99G. Stanford Introductory Seminar: The Two Cultures—Bridging the Gap—Preference to freshmen. In 1959, the British physicist and novelist C. P. Snow delivered a lecture at Cambridge University in which he argued that "the intellectual life of the whole of western society is increasingly being split into two polar groups." In Snow's view, these groups, which can be characterized roughly as humanists and scientists, exist as separate cultures that have "almost ceased to communicate at all." Professors in Computer Science and English collaborate to examine the nature of this split, reflected at Stanford by the tendency to divide the campus community into "techies" and "fuzzies," and explore ways to bridge this cultural gap.

3 units, Aut (Roberts, Saldivar)

99H. Stanford Introductory Seminar: Programming and Problem Solving Seminar—Preference to freshmen. Students are given five problems to solve. Each involves programming, but programming is not sufficient to solve the problem (i.e., the approach to the problem is at least important). Students experiment individually and as a group with techniques, and write a working program as a solution. Group discussions include general problem-solving approaches and concepts relevant to the problem at hand. Prerequisite: 106B or 106X.

3 units (Ullman) not given 2000-01

99I. Stanford Introductory Seminar: Business on the Information Highways—Preference to freshmen. Understanding the capabilities of the Internet and its services. The effect on commerce, education, and healthcare. Technical and business alternatives. Who will be hurt and who will benefit from the changes occurring? The central project develops sections of a Web publication.

3 units, Win (Wiederhold)

99J. Stanford Introductory Seminar: Computer Security in the Electronic Age—Preference to sophomores. Based on readings and discussions of current issues in computer security. Topics: the history of codes and ciphers and a summary of basic mathematics used in current cryptography; causes of computer vulnerabilities, including program errors, design flaws, and inherent network and browser limitations; policies and practices that restrict or monitor access to information.

3 units (Mitchell) not given 2000-01

99K. Stanford Introductory Seminar: Digital Actors—Preference to sophomores. Digital actors are an emerging field, with applications to video games, movies, simulation and training, manufacturing, and animated web pages. Introduces the computational techniques used to create and animate robotics, geometric computing, computer vision, and graphics. The problem of creating/animating digital actors, technical subproblems. Prerequisite: knowledge of elementary geometry. Recommended: some programming experience.

3 units (Latombe) not given 2000-01


3 units (Boneh) not given 2000-01

99N. Stanford Introductory Seminar: Ruler, Compass, and Computer-Computational Representations of Geometry—Preference to sophomores. Representations of geometry play an important role in computer science in the physical world. Models of physical objects and processes as used in computer graphics, computer vision, and robotics use geometry as an essential component of representing shape, motion, and other physical modalities. The mathematical ideas behind commonly used representations and algorithms for geometric objects, focusing on intuitive understanding as opposed to formal development. Prerequisite: introductory CS class, e.g., 106A, B or X. Recommended: general background knowledge in mathematics and physics.

3 units, Spr (Guibas)

99P. Stanford Introductory Seminar: Smart Computers and other Technological Opportunities—Preference to freshmen. How smart are computers now? How smart can we make them, and how soon, and what good will they be? Of the current "smart" things, how smart are they and what genuine benefits are offered? Outside of computers, what are the technological opportunities for humanity? To what extent is humanity in difficulty with natural resources? What significant threats are there to humanity?

3 units (McCarty) not given 2000-01

99Q. Stanford Introductory Seminar: Universal Ideas in Computation—Preference to freshmen. Techniques and ideas that cut across computer science, emphasizing concepts that also show up extensively in non-computer systems. Examples: indirection (especially naming and translation); using the past to predict the future; using randomness to make robust decisions; the pervasiveness of "skew" in data (20% of the code consumes 80% of CPU cycles, 4% of fighter pilots account for 40% of all kills); and the universality of scheduling and concurrency control, which are used to coordinate access to shared resources such as shared memory, intersections, classrooms, bathroom stalls, etc.

3 units, Spr (Engler)

103A. Discrete Mathematics for Computer Science—The fundamental mathematical foundations required for computer science. Topics: logic, relations, functions, basic set theory, proof techniques, combinatorics, recursion, and recurrence relations. GER:2c (DR:4)

3 units, Aut, Win (Johnson)

103B. Discrete Structures—Continuation of 103A. Topics: analysis of algorithms, mathematical formulations of basic data models (linear models, trees, graphs, and sets), regular expressions, grammers. Corequisite: 106B or 106X.

3 units, Win, Spr (Johnson)

103X. Discrete Structures (Accelerated)—Covers the material in 103A and B in a single quarter. Students who take 103X feel comfortable with mathematical formalism. GER:2c (DR:4)

3 units, Win (Dill, Mitchell)

* May be taken for 3 units by graduate students.

105. Introduction to Computers—For non-technical majors. What computers are and how they work. Practical experience in programming. Construction of computer programs and basic design techniques. A survey of Internet technology and the basics of computer hardware. Students in technical fields and students looking to acquire programming...
understand the concepts presented in 106A, usually in a language other
than C. First three weeks focus on understanding how the concepts are
expressed in ANSI C. GER:2b (DR:6)

106B. Programming Abstractions—Abstraction and its relation to
programming. The software engineering principles of data abstraction,
modules, certain fundamental data structures (e.g., stacks and queues),
and data-directed design. Recursion and recursive data structures (linked
lists and binary trees). Brief introduction to time and space complexity
analysis. Prerequisite: 106A or consent of the instructor, based on prior
exposure to ANSI C. GER:2b (DR:6)

106X. Programming Methodology and Abstractions (Accelerat-
ed)—Covers most of the material in 106A,B. Students are expected to
have previous programming experience at a level that allows them to
understand the concepts presented in 106A, usually in a language other
than C. First three weeks focus on understanding how the concepts are
expressed in ANSI C. 106B material is covered for the balance. Students
who complete 106A should enroll in 106B. 106X can be taken after 106A
only with consent of instructor. GER:2b (DR:6)

107. Programming Paradigms—Intense introduction to a variety of
programming paradigms, programming languages, and language imple-
mentations. Topics: the compile-time languages, using advanced mem-
ory management features of imperative and multithreaded C; the func-
tional paradigm, using LISP (or possibly ML); the object-oriented
paradigm, using Java (and possibly Python); and the generic program-
ning paradigm, introducing C++ and templates. Substantial program-
ming projects. Prerequisite: 106B, 106X, or equivalent.

108. Object-Oriented Systems Design—Software design and con-
struction in the context of large OOP libraries. May be taught in C++
or Java. Topics: review of OOP, the structure of Graphical User Interface
(GUI) OOP libraries, GUI application design and construction, OOP
software engineering strategies, approaches to programming in teams.
Prerequisite: 107.

110. Introduction to Computer Systems and Assembly Language
Programming—Organization of digital computers, buses, registers,
processors, I/O, memory systems, and paging memory. Data representa-
tion, data structures, and computer arithmetic. Instruction sets and
execution; addressing modes. Assembly language programming, includ-
ing subroutines, co-routines, interrupts, and traps. Operating systems
issues and principles of storage management; combines general princi-
ples and practice in implementations. Prerequisite: 106B or 106X.

112. Computer Organization and Design—(Enroll in Electrical Engi-
neering 182.)

121. Artificial Intelligence—(Only one of 121/221 counts towards CS
degree requirements.) Introduction to the key concepts, representations,
and techniques used in building practical computational systems ("agents")
that appear to display artificial intelligence (AI), through the use of
sophisticated adaptive information processing algorithms. Topics: histo-
ry of AI, reactive systems, heuristic search, planning, constraint satisfac-
tion, knowledge representation and uncertain reasoning, machine learn-
ing, classification, applications to language, and vision. Prerequisites:
103B or 103X and basic facility with differential calculus, vector
algebra, and probability theory.

137. Introduction to Scientific Computing—The fundamental issues
of numerical computation for the mathematical, computational, and
physical sciences, and engineering. Emphasis is from the perspective of
the computer scientist. Use of numerical algorithms in engineering
practice. Problems of accurately computing solutions in the presence of
rounding errors and of computing discrete approximations of solutions
which are defined on the continuum. The taxonomy of problem classes
with methods for their solution and principles useful for analysis of
performance and algorithmic development. Topics: error analysis, the
solution of linear and nonlinear equations, interpolation and numerical
differentiation, the approximation of integrals, and the solution of
differential equations. Prerequisites: 106A; Mathematics 103 or 113 or
equivalents.

138. Matlab and Maple for Science and Engineering Applications—
Introduction to use of Matlab and Maple in engineering applications.
Emphasis is on the use of software to solve real problems. How the
algorithms work, primarily so user may understand their possible limi-
tations. How to use packages to solve a variety of introductory but
important problems in: linear systems, eigenvalue problems, ordinary
differential equations, elementary statistics, elementary signal process-
ing (Fourier transforms, wavelets), computer algebra, graphical interfac-
es. Applications for the engineering and physical sciences. Prerequisites:
undergraduate linear algebra and a willingness to program.

140. Operating Systems and Systems Programming—The funda-
mentals of operating systems design and implementation. Basic struc-
ture; synchronization and communication mechanisms; implementation
of processes, process management, scheduling, and protection; memory
organization and management, including virtual memory; I/O device
management, secondary storage, and file systems. Prerequisite: 108.
Recommended: Electrical Engineering 182.

143. Compilers—Principles and practices in the design of programming
language compilers. Topics: lexical analysis; parsing theory (LL, LR,
and LALR parsing); symbol tables; type checking; common representa-
tions for records, arrays, and pointers; runtime conventions for procedure
calls; storage allocation for variables; and generation of unoptimized
code. Students construct simple compiler as programming project.
Prerequisites: 103B or X, 107.

145. Introduction to Databases—Entity-relationship and relational
data models and approaches to database design. Relational and object-
relational query languages, with substantial coverage of SQL including
SQL3. Algebraic query languages and some database theory. Integrity
constraints, triggers, and views; functional dependencies and normal
forms. Object-oriented database design and query languages including
ODMG standard. Database transactions and security from the applica-
tion perspective. Designing a database for an application. Interactive and

* May be taken for 3 units by graduate students
programmatic interfaces to database systems. Introduction to advanced
topics, e.g., data warehouses, data mining, XML, and Web/database
interactions. Individual database application programming project with
extensive use of SQL. Prerequisites: 103B or X, 107.

147. Introduction to Human-Computer Interaction Design—Introduction
to the concepts underlying the design of human-computer
interaction: usability and affordances, direct manipulation, systematic
design methods, user conceptual models and interface metaphors, design
languages and genres, human cognitive and physical ergonomics, information
and interactivity structures, design tools and environments. Structured
around a set of case studies in which notable interface designs and/or projects are analyzed as illustrative of underlying principles.
Students participate in discussions of cases and do interface analysis and
design exercises.
3-4 units, Aut (Winograd)

148. Introductory Computer Graphics—(For undergraduates; M.S.
students or students with a strong interest in continuing in graphics
should take 248. Only one of 148 or 248 counts towards CS degree
requirements.) Introduction to two- and three-dimensional computer
graphics. Topics: fundamentals of input and display devices, scan
conversion of geometric primitives, two- and three-dimensional trans
formations and clipping, windowing techniques, curves and curved
surfaces, three-dimensional viewing and perspective, hidden surface
removal, illumination and color models, OpenGL, VRML, and 3-D
modeling tools. Emphasis is on the development of practical skills in
using graphics libraries and tools. Programming on Macintosh using C,
OpenGL, and VRML, with demos in SoftImage. Prerequisites: 107,
Mathematics 103.
3 units, Aut (Staff)

154. Introduction to Automata and Complexity Theory—Regular
sets: finite automata, regular expressions, equivalences among notations,
methods of proving a language not to be regular. Context free
languages: grammars, pushdown automata, normal forms for grammars,
proving languages non-context free. Turing machines: equivalent forms, undecidability. Nondeterministic Turing machines: properties, the class
NP, complete problems for NP, Cook's theorem, reducibilities among
problems. Prerequisite: 103B or X.
*4 units, Win (Staff)
Spr (Moitwani)

154N. Introduction to NP Completeness—Turing machines: equiva
lent forms, undecidability. Nondeterministic Turing machines: properties,
the class NP, complete problems for NP, Cook's theorem, reducabilities
among problems. Students participate in approximately the last half of 154.
Prerequisite: a knowledge of formal languages and automata as in
the first part of 154.
2 units, Win (Staff)
Spr (Moitwani)

156. Introduction to Verification and Concurrency—A taste of logic:
propositional, predicate, temporal. Specification and verification of
sequential programs: correctness and termination. Concurrent program
ming: communication and synchronization, principles and algorithms.
Specification of concurrent programs: safety and progress. Verification
of safety properties: invariants. Prerequisite: 103B or X.
3 units (Manna)

157. Logic and Automated Reasoning—Introduction to logic for
computer scientists. An elementary exposition from a computational
point of view, of propositional logic, predicate logic, axiomatic theories,
and theories with equality and induction. Interpretations, models, valid
ity, proof. Automated deduction: polarity, skolemization, unification,
resolution, equality. Strategies. Applications. Prerequisite: 103B or X.
*4 units, Aut (Manna)
Spr (Genesereth)

157L. Logic and Automated Reasoning Laboratory
1 unit

161. Design and Analysis of Algorithms—Efficient algorithms for
sorting, searching, and selection. Algorithm analysis: worst and average
case analysis. Recurrences and asymptotics. Data structures: balanced
trees, heaps, etc. Algorithm design techniques: divide-and-conquer,
dynamic programming, greedy algorithms, amortized analysis. Algo
rithms for fundamental graph problems, e.g., depth-first search, connect
ed components, topological sort, shortest paths. Possible topics: network
flow, string searching, parallel computation. Prerequisite: 103B or X;
Statistics 116.
*4 units, Aut (Plotkin)
Win (Staff)

162. Introduction to Combinatorics and its Applications—(Enroll in
Mathematics 108.)
3 units, Aut (Diaconis)

163. Symmetric Functions and Algebraic Combinatorics—(Enroll in
Mathematics 112.)
3 units, Win (Diaconis)

191. Senior Project—Restricted to Computer Science students. Group
or individual projects under faculty direction. Register using the section
number associated with the instructor.
1-6 units, any quarter (Staff)

191W. Writing Intensive Senior Project—Restricted to Computer
Science students. Group or individual projects under faculty direction.
Register using the section number of an Academic Council member.
(WIM)
1-6 units, any quarter (Staff)

192. Programming Service Project—Restricted to Computer Science
students. Appropriate academic credit (without financial support) is
given for volunteer computer programming work of public benefit and
educational value.
1-3 units, any quarter (Staff)

193D. C++ and Object-Oriented Programming—C++ programming
language and object-oriented programming paradigm. The major fea
tures of C++ 3.0 and the object design principles which apply generally
in Object Oriented Languages. Intensive programming assignments.
Prerequisites: knowledge of C and basic programming methodology as
developed in 106B or 106X.
3 units, Win (Cain)

193H. Human-Computer Interface Tools—Design-practitioner ori
ented survey of tools for building interactive interfaces, including
Director, Flash, and Basic Visual. Emphasis is on understanding interac
tion issues, exploiting tool capabilities, rapid prototyping, and extending
design skills. Prerequisites: programming fundamentals at the level of
106B or 106X.
3 units, Aut (Staff)

193I. Internet Technologies—Programmer-oriented survey of the au
thoring, distributing, and browsing technologies. The role, use, and
implementation of current Internet tools. Topics: TCP/IP; namespace,
connections, and protocols. Client/server structures. Web/HTTP/HTML
techniques for text, images, links, and forms. Server side programming,
CGI scripts. Security and privacy issues. Programming projects on
client- and server-side may be in Perl or Java. Languages are introduced
as needed. Emphasis is on understanding, exploiting, and extending
Internet technologies. Prerequisites: programming fundamentals at the

* May be taken for 3 units by graduate students
level of 106B or 106X, and the ability to build and debug programs in a Unix environment.

3 units, Win (Cain)

193J. Programming in Java—Hands-on experience to gain practical Java programming skills. Topics: object-oriented programming (classes, objects, messaging, inheritance), Java language features (interfaces, exceptions, packages, concurrency, garbage collection), use of the built-in packages (lang, util, io, networking, awt, swing), applets and servlets, security and verification, Java implementation and the virtual machine. Intensive programming assignments. Prerequisite: knowledge of C language and programming experience at the level of 106B, 106X.

3 units, Win (Cain)

193K. Advanced Java Applications—Tour of the advanced applications possible in Java. Possible topics: portable GUIs in Swing and distributed applications with RMI, and the various supporting technologies, e.g., concurrency, reflection, and serialization. Prerequisite: mastery of Java, e.g., 193J.

2 units, Spr (Parlante)

193L. Programming in LISP—Introduction to problem solving in the LISP language, focusing on the functional programming paradigm. Topics: recursion, list manipulation, mapping, functional arguments, destructive processing, macros, I/O, Lisp implementation, environments, packages, efficiency, object-oriented programming, classes, and methods. Term project. Prerequisite: 106B or 106X, or equivalent.

3 units (McCarthy)

193W. Microsoft Windows Programming—The fundamentals of programming on the Microsoft Windows platform, focusing on the use of Microsoft Foundation Class (MFC) framework. Other aspects of Windows programming including Microsoft’s COM and OLE object models. Requires a significant amount of programming. Prerequisite: knowledge of C++ at the level of 108 or 193D.

3 units, Win (Young)

194. Software Project—Student teams complete a significant programming project through the phases of design, specification, coding and testing under faculty supervision. Lectures on software engineering methodologies. Implementation; well-written proposal, specification, and software design document; demonstration of a prototype design and the final product. Prerequisite: 108. (WIM)

3 units, Win (Young)

195. Microcomputer Consulting—Overview of computer consulting, focusing on Macintosh and IBM-compatible systems. Topics: operating systems, networks, troubleshooting, and consulting methodology. Bi-weekly lectures emphasize on-campus computing environments. Students work as consultants in campus computer clusters and in residences. Prerequisite: 1C.

2 units, Aut, Spr (Staff)

196. Mainframe and Workstation Computer Consulting—Computer consulting in a workstation and server environment, focusing on the UNIX operating system under the SUN, HP, and SGI hardware systems. Topics: UNIX fundamentals, consulting tips, networking, and systems administration. Students work as on-duty consultants at the Sweet Hall and Terman computer clusters. Pre- or corequisite: 1U.

2 units, Win, Spr (Staff)

198. Teaching of Computer Science—Teach a small discussion section of 106A while learning the fundamentals of teaching a programming language at the introductory level. Two workshops/meeting weekly on introductory material in general, 106 specifically, and teaching techniques. Application and interview required; see the 198 coordinator in CS for information. Prerequisite: 106B or 106X.

4 units, Aut, Win, Spr (Roberts, Chong, Burgess)

199. Independent Work—Special study under faculty direction, usually leading to a written report. Letter grade given; if this is not appropriate, enroll in 199P. Register using the section number associated with the instructor.

any quarter (Staff)

199P. Independent Work—Like 199, but graded Satisfactory/No Credit.

any quarter (Staff)

UNDERGRADUATE AND GRADUATE

200. Undergraduate Colloquium—Strongly recommended for junior-year CS majors as a way to build contacts with faculty. Weekly presentations by faculty and people from industry informally describing their views of computer science as a field and their experience as computer scientists. (AU)

1 unit, Aut (Plummer)

201. Computers, Ethics, and Social Responsibility—Primarily for majors entering computer-related fields. Analysis of the ethical and social issues related to the development and use of computer technology. Introduction to the relevant background in ethical theory, and the social, political, and legal considerations. Analysis of scenarios in specific problem areas: privacy, reliability and risks of complex systems, and the responsibility of professionals for the applications and consequences of their work. Prerequisite: 106B or 106X. (WIM)

*4 units, Win (Roberts)

205. Mathematical Methods for Robotics and Vision—Overview of some of the mathematical background necessary for research in robotics and vision. Possible topics: geometric meaning of linear algebra concepts; Singular Value Decomposition; Schur Decomposition; differential equations; dynamic systems and stochastic estimation (Kalman filtering); vector and tensor calculus; calculus of variations. Prerequisites: 106B or 106X, Mathematics 51 and 113; or equivalents.

3 units, Aut (Tomasi)

206. Technical Foundations of Electronic Commerce—As the internet and wide-area networks are increasingly used to conduct commerce, computer scientists need to understand the nature of economic mechanisms, e.g., auctions, and devise the ways to implement them efficiently. Relevant economic theories. Lab to design and implement a substantial application in small groups. Prerequisites: sufficient mathematical maturity to follow basic combinatorial and probabilistic arguments, and ability to code in either C++ or Java.

3 units, Spr (Shoham, Boneh, Ullman)

211. Logic Design—(Enroll in Electrical Engineering 275.)

3 units, Aut, Win (McCluskey)


3 units, Aut, Win (Staff)

221. Artificial Intelligence: Principles and Techniques—(Only one of 121 or 221 counts towards CS degree requirements.) Broad technical introduction to core concepts and techniques in artificial intelligence. Topics: search, planning, constraint satisfaction. knowledge representation, probabilistic models, machine learning, neural networks, vision, robotics, and natural language understanding. Prerequisites: 103B or 106X, or 109 and 157, or Philosophy 160A and exposure to basic concepts in probability. Recommended: facility with basic differential calculus.

*4 units, Aut (Koller)

222. Knowledge Representation—Declarative knowledge representation methods in artificial intelligence. Topics: time and action, defaults, compositional modeling, object-oriented representation, inheritance,

* May be taken for 3 units by graduate students
ontologies, knowledge on the Web, knowledge servers, multiple views, qualitative modeling. Prerequisite: basic familiarity with logic. Recommended: prior exposure to artificial intelligence as in 121/221.

3 units, Win (Fikes)

223A. Introduction to Robotics—Topics: manipulator kinematics and inverse kinematics; manipulator dynamics, motion, and force control; motion planning and robot programming. Recommended: knowledge of matrix algebra.

3 units, Win (Khatib)

223B. Introduction to Computer Vision—Fundamental issues and techniques of computer vision. Image formation, edge detection and image segmentation. Limited enrollment. Prerequisite: 125A or equivalent.

3 units, Win (Tomasi)

224M. Multi-Agent Systems—Aimed at advanced undergraduate, master’s levels, and interested Ph.D. students. Various aspects of extending AI theories and techniques from the single-agent case to the multi-agent (MA) case. Topics: MA knowledge representation, planning, reasoning under uncertainty, learning, coordination mechanisms, and automated negotiation. Emphasis is on representation techniques and algorithms, the former drawn from logic, decision theory, and game theory. There are no programming assignments or textbooks on the topic. Limited enrollment. Prerequisites: knowledge of basic probability theory, first-order logic, and algorithms.

3 units, Win (Shoham)

224N. Natural Language Processing—(Enroll in Linguistics 237.) Limited enrollment. Prerequisites: Basic programming skills at the level of 106B, 106X, 205, or equivalent.

3 units, Spr (Manning)

225A. Experimental Robotics—Hands-on experience with robotic manipulation and navigation systems. Topics: kinematic and dynamic control of motion, compliant motion and force control, collision avoidance, motion planning, assembly planning, task specifications, and robot-human interfaces. Limited enrollment. Prerequisite: 223A.

3 units, Spr (Khatib)

225B. Robot Programming Laboratory—Hands-on introduction to the techniques of robot programming for robotics and non-robotics students. Series of guided exercises in which students program mobile robots to exhibit increasingly complex behavior (simple dead reckoning and reactivity, planning and map building, communication and cooperation). Topics: basics of motor control and sensor characteristics; sensor fusion, model construction, and robust estimation; control regimes (fuzzy control and potential fields); active perception; reactive planning architectures; various topics in sensor-based control, including vision-guided navigation. Student programmed robot contest. Programming is in C on Unix or Windows machines, done in teams. Prerequisites: Basic programming skills at the level of 106B, 106X, 205, or equivalent.

4 units, Aut (Konolige)

226. Knowledge-Based Systems and Applications—Knowledge-based (expert) system technology is the most widely-used application technology to emerge from AI. Topics: basics of KBs and ES; tech transfer from research to industry; knowledge engineering, KB programming, knowledge acquisition methodology; evolution of the technology as applied to business and government problems, current and future impact. Case studies, readings. System building project possible. Some guest lectures.

3 units, not given 2000-01

227. Reasoning Methods in AI—Technical presentation of algorithmic techniques for problem solving in AI. Combines formal algorithmic analysis with description of recent applications. Topics: propositional satisfiability, constraint satisfaction, planning and scheduling, diagnosis and repair. Focus is on recent results. Prerequisites: familiarity with the basic notions in data structures and design and with techniques in the design and analysis of algorithms. Recommended: previous or concurrent course in AI.

3 units, Spr (Nayak)

228. Probabilistic Models in Artificial Intelligence—Probabilistic modeling languages suitable for representing complex domains, algorithms for reasoning and decision making using these representations, and learning these representations from data. Focus is on graphical modeling languages such as Bayesian belief networks, extensions to temporal modeling using hidden Markov models and dynamic Bayesian networks, and extensions to decision making using influence diagrams and Markov decision processes. Recent applications to domains (speech recognition, medical diagnosis, data mining, statistical text modeling, and robot motion planning). Prerequisites: understanding of basic concepts in probability theory and in design and analysis.

3 units, Win (Koller)

229. Statistical Learning—Survey of major research areas in pattern recognition and statistical learning. Topics: foundations of statistical pattern recognition, parametric and non-parametric density estimation, linear and nonlinear classifiers, decision trees, Bayesian and neural networks, reinforcement learning, learning theory, and recent trends (e.g., boosting and support vector machines). Focus is on the underlying concepts and their application to various problems in vision, speech, language processing, animation, control, etc. Prerequisites: background in linear algebra, basic probability theory, and statistics; ability to write computer programs in one or more commonly used languages.

3 units, Win (Bregler)

237. Advanced Numerical Analysis—Three-quarter graduate sequence designed to acquaint students in mathematical and physical sciences and engineering with the fundamental theory of numerical analysis. Examples from applications.

237A. Numerical Linear Algebra—First in a three-quarter graduate sequence. Solution of systems of linear equations: direct methods, error analysis, structured matrices; iterative methods and least squares. Prerequisites: 106A, 137, Mathematics 103 or 113.

3 units, Win (Golub)


3 units, Spr (Staff)


3 units, Spr (Staff)

238. Parallel Methods in Numerical Analysis—Recent developments in parallel computer technology have made it necessary to reformulate numerical algorithms to exploit the full potential of this technology. Emphasis is on the different techniques for obtaining maximum parallelism in various numerical algorithms, especially those occurring when solving matrix problems and partial differential equations, and the subsequent mapping onto the computer. Implementation issues on parallel computers. Topics: parallel architecture, programming models, matrix computations, FFT, fast multiple methods, domain decomposition, graph partitioning. Prerequisite: 237A or Mechanical Engineering
200A, or consent of instructor. Recommended: familiarity with differential equations, and experience in advanced programming language such as F90, C, C++. 
3 units, Win (Staff)

240. Advanced Topics in Operating Systems—Advanced study in OS topics and exposure to recent developments in OS research. Readings/lectures on classic and new papers. Topics: virtual memory management, synchronization and communication, file systems, protection and security, operating system extension techniques, fault tolerance, and the history and experience of systems programming. Prerequisite: 140 or equivalent. 
3 units, Win (Staff) 
Spr (Rosenblum)

241. Advanced Topics in Internet Technologies and Systems—Architecture, design, and implementation of Internet-scale software infrastructure (services and applications). Achieving scalability, high availability, and robustness through modular software structure and performance tradeoffs, including harvest vs. yield and consistency vs. availability. Cluster-based runtime systems for Internet workloads, implementation and deployment challenges, economics of deploying and operating a service. Extending Internet services to mobile and post-PC era. 
3 units, Win (Fox)

242. Programming Languages—The basic elements of programming languages and programming paradigms: functional, imperative, and object-oriented. Introduction to formal semantic methods. Modern type systems, higher-order functions and closure, exceptions and continuations. Runtime support for different language features. Emphasis on separating the different elements of programming languages and styles. First half uses Lisp and ML to illustrate concepts; second half a selection of object-oriented languages. Prerequisite: 107, or experience with Lisp, C and some object-oriented language. 
3 units, Aut (Mitchell)

243. Advanced Compiling Techniques—The theoretical and practical aspects of building modern compilers. Topics: intermediate representations, basic blocks and flow-graphs, dataflow analysis, register allocation, global code optimizations, and interprocedural analysis. Prerequisite: 143 or equivalent. 
*4 units, Win (Lam)

244A. Introduction to Computer Networks—The principles and practice of computer networking, with emphasis on the Internet. The structure and components of computer networks, packet switching, layered architectures, TCP/IP, physical layer, error control, window flow control, local area networks (Ethernet, Token Ring; FDDI), network layer, congestion control, quality of service, multicast. Students enrolling in 244A Winter Quarter must have completed 140, or equivalent. 
*4 units, Aut (Tobagi) (enroll in Electrical Engineering 284) Win (McKeown)

244B. Distributed Systems—Distributed operating systems and applications issues, emphasizing high-level protocols and distributed state sharing as the key technologies. Topics: distributed shared memory, object-oriented distributed system design, distributed directory services, atomic transactions and time synchronization, file access, process scheduling, process migration and remote procedure call focusing on distribution, scale, robustness in the face of failure, and security. Prerequisites: 240, 244A. 
3 units, Spr (Staff)

244C. Distributed Systems Project—Companion project option for students taking 244B. Corequisite: 244B. 
3-6 units, Spr (Staff)

3 units, Win (Garcia-Molina)

247A. Human-Computer Interaction: Interaction Design Studio—Intended as preparation for project-based courses, e.g., 377 and 447/Mechanical Engineering 293. Systematic presentation and experience with the methods used in interaction design, including needs analysis, user observation, idea sketching, concept generation, scenario-building, storyboards, user character stereotypes, usability analysis, and market strategies. Prerequisite: 147 or Mechanical Engineering 101. 
3-4 units, Aut, Win, Spr (Staff)

247B. Contextual and Organizational Issues in Human-Computer Interaction—Enroll in Management Science and Engineering 430.) 
3-4 units, Spr (Hinds)

248. Introduction to Computer Graphics—(Only one of 148 or 248 counts towards CS degree requirements.) The fundamentals of input, display, and hardcopy devices, scan conversion of geometric primitives, 2D and 3D geometric transformations, clipping and windowing, scene modeling and animation, algorithms for visible surface determination, introduction to local and global shading models, color, and photorealistic image synthesis. Written assignments and programming projects. Prerequisites: 107, Mathematics 103 or equivalent. 
*5 units, Aut (Levoy)

248V. Introduction to Scientific Visualization—Alternative introduction to computer graphics, emphasizing techniques for visualizing multidimensional data, especially continuous functions of two and three dimensions. Topics: the graphics pipeline, visualization of scalar, vector, and tensor fields, volume rendering, isosurface extraction, display of level sets and polygon meshes, and programming toolkits and interactive systems for data visualization; the design of visual metaphors for medical imaging, fluid flow, geophysics, meteorology, and other applications. Written assignments and programming projects. Not a substitute for 248 as a prerequisite for upper-level graphics courses. Prerequisites: basic calculus, linear algebra, and ability to program in C or C++. 
*4 units, Spr (Fedkiw, Levoy)

249. Object-Oriented Programming from a Modeling and Simulation Perspective—Object-oriented programming techniques and issues, emphasizing programming as modeling and simulation. Topics: large-scale software development approaches, encapsulation, use of inheritance and dynamic dispatch, design of interfaces and interface/implementation separation, exception handling, design patterns, minimizing dependencies and value-oriented programming. The role of programming conventions/style/restrictions in surviving object-oriented programming for class libraries, frameworks, and programming-in-the-large; general techniques for object-oriented programming. Prerequisites: knowledge of C and basic programming methodology as developed in 106B or 106X, 107, basic knowledge of C++ (may be taken concurrently). Recommended: 193D. 
3-5 units, Win (Staff)

255. Introduction to Cryptography and Computer Security—Intended for advanced undergraduates and graduate students. Introduction to the basic theory and practice of cryptographic techniques used in computer security. Topics: encryption (single and double-key), digital signatures, pseudo-random bit generation, authentication, electronic commerce (anonymous cash, micropayments), key management, zero-
knowledge protocols. Prerequisite: basic understanding of probability theory.

3 units, Win (Boneh)


3 units, Win (Manna)

256L. Formal Methods for Concurrent and Reactive Systems Laboratory
2 units, Win (Manna)

257. Automated Deduction and its Applications—Proving theorems and extracting information from proofs. Uses in software engineering (program specification, synthesis, and verification) and artificial intelligence (commonsense and robotic planning, natural-language understanding). The foundations of logic programming. Deductive tableaux, nonclausal resolution, skolemization, building theories into unification and inference rules, term rewriting, inductive theorem proving. The design of theorem provers. Prerequisite: 157.

3 units (Staff)

258. Introduction to Programming Language Theory—Syntactic, operational, and semantic issues in the mathematical analysis of programming languages. Type systems and non-context-free syntax. Universal algebra and algebraic data types. Operational semantics given by rewrite rules; confluence and termination. Scott-semantics for languages with higher-type functions and recursion. Treatment of side-effects. Prerequisites: 154, 157 or Philosophy 160A.

3 units, Win (Mitchell)

260. Concrete Mathematics—Mathematics for the analysis of algorithms: recurrences, summations, generating functions, asymptotics. Elementary combinatorics, discrete probability, and number theory. Prerequisites: 103B or 103X, Mathematics 42, or equivalent.

3 units, Win (Manna)


3 units, Win (Plotkin)

270A. Introduction to Medical Informatics: Fundamentals Methods—(Same as Biomedical Informatics 210A.) Issues in the modeling, design, and implementation of computational systems for use in biomedicine. Topics: controlled terminologies in medicine and biological science, ontologies, fundamental algorithms, basic knowledge representation, information dissemination and retrieval. Emphasis is on the principles of modeling data and knowledge in biomedicine and on the translation of resulting models into useful automated systems.

3 units, Aut (Musem, Altman)

270B. Introduction to Medical Informatics: Systems and Requirements—(Same as Biomedical Informatics 210B.) Survey of the major application areas in medical informatics, including clinical information systems, imaging systems, bioinformatics, public policy, decision support, and signal processing. Emphasis is on the system requirements, relevant data, algorithms, and implementation issues in each area. Prerequisite: 270A.

3 units, Win (Shahar, Dev)

271. Decision-Making Methods for Biomedicine—For undergraduates or graduate students, building on concepts introduced in 270B. Intermediate biomedical decision making and survey of the methods for the implementation of such concepts in computer-based decision-support tools. Emphasis is on Bayesian statistics, decision analysis, cost-benefit analysis, neural networks, artificial intelligence/expert systems, belief networks, influence diagrams, and the synergies among such approaches. Prerequisites: 270B and at least one programming course.

3 units (Higgins, Garber, Owens, Sanders) not given 2000-01

272. Medical Informatics Project Course—(Same as Biomedical Informatics 212.) For students who have completed 270A, 270B, 271 or 274, and who wish to implement those ideas in a computer program. Students may take 274 concurrently and complete a project that is coordinated between the two courses. Prerequisites: programming experience, 270B.

3 units, Sum (Altman, Koza)

274. Representations and Algorithms for Computational Molecular Biology—(Same as Biomedical Informatics 214.) Introduction to basic computational issues and methods used in bioinformatics, including access and use of biological data sources on the Internet. Topics: basic algorithms for alignment of biological sequences and structures, computing with strings, phylogenetic tree construction, hidden Markov models, computing with networks of genes, basic structural computations on proteins, protein structure prediction, protein threading techniques, homology modeling, molecular dynamics and energy minimization, statistical analysis of 3D biological data, integration of diverse data sources, knowledge representation and controlled terminologies for molecular biology, graphical display of biological data, genetic algorithms and genetic programming applied to biological problems. See instructor for unit options. Prerequisites: programming skills and understanding of matrix algebra.

1-4 units, Spr (Altman, Koza)

275A. Musical Information: An Introduction—(Enroll in Music 253.)
1-4 units, Win (Selfridge-Field)

275B. Seminar: Musical Representation and Computer Analysis—(Enroll in Music 254.)
1-4 units, Spr (Selfridge-Field)

298. Seminar on Teaching Introductory Computer Science—Opportunity for faculty and undergraduate and graduate students who are interested in teaching to discuss specific topics raised by teaching computer science at the introductory level. Prerequisite: consent of instructor.

1-3 units, Aut, Win, Spr (Roberts)

PRIMARILY FOR GRADUATE STUDENTS

300. Departmental Lecture Series—For first-year Computer Science Ph.D. students. Presentations by members of the department faculty, each describing informally his or her current research interests and views of computer science as a whole. (AU)
1 unit, Aut (Staff)

309. Industrial Lectureships in Computer Science—The department invites an outstanding computer scientist to give a course in his/her specialty. Lecturers and topics change yearly; courses may be taken repeatedly. See Time Schedule for offerings.

3 units

312. Processor Design—(Enroll in Electrical Engineering 382.)
3 units (Staff) given 2001-02

3 units (Staff) not given 2000-01

315B. Parallel Programming Project—Continuation of 315A. A significant parallel programming project is required using shared-memory, message-passing, or data-parallel machines. Lectures on parallel programming languages and their implementation, performance debugging of parallel programs, parallel data structures and algorithms. Prerequisite: 315A or consent of instructor.

3 units (Staff)

316A. Logic Synthesis of VLSI Circuits—(Enroll in Electrical Engineering 318.)

3 units, Win (DeMicheli)

316B. Computer-Aided System Design Laboratory—(Enroll in Electrical Engineering 319.)

3 units, Spr (DeMicheli)


3 units, (Staff) alternate years, given 2001-02

318. Testing Aspects of Computer Systems—(Enroll in Electrical Engineering 488.)

3 units, alternate years, given 2001-02

319. Topics in Digital Systems—Advanced material is often taught for the first time as a "topics" course, perhaps by a faculty member visiting from another institution. Students may therefore enroll repeatedly in a course with this number. See Time Schedule for topics currently being offered.

by arrangement

323. Common Sense Reasoning in Logic—Formalizing common sense knowledge and reasoning using situation calculus with nonmonotonic logics, especially circumscription. Variations of situation calculus. Formalizing context. Formalizing facts about knowledge. Prerequisite: basic knowledge of logic such as 157, or Philosophy 160A.

3 units, Aut (McCarthy)

326A. Motion Planning—For students interested in computer graphics, geometrical computing, robotics, and/or artificial intelligence. Computing object motions is central to many application domains (e.g., design, manufacturing, robotics, animated graphics, medical surgery, drug design). Basic path planning methods generate collision-free paths among static obstacles. Extensions include uncertainty, mobile obstacles, manipulating movable objects, and maneuvering with kinematic constraints. Configuration space is a unifying concept, geometric arrangements are a basic combinatorial structure. Theoretical methods with applications in various domains: assembly planning, radiosurgery, graphic animation of human figures.

3 units (Latombe) not given 2000-01

327A. Advanced Robotic Manipulation—Topics: redundant manipulators, robot motion/force control; kinematic singularities; inertial properties, dynamic performance, and robot design; macro/micro manipulator systems; mobile manipulator platforms; cooperative robots; sensor-based primitives, artificial potential field and force strategies. Prerequisites: 223A, consent of instructor.

3 units, Spr (Khatib)

328. Topics in Computer Vision—Fundamental issues of, and mathematical models for, computer vision. Sample topics: camera calibration, texture, stereo, motion, shape representation, image retrieval, experimental techniques. Student papers and project. Prerequisites: 205, 223B, or equivalents.

3 units, Apr (Tomasi) alternate years, not given 2001-02

329. Topics in Artificial Intelligence—Advanced material is often taught for the first time as a "topics" course, perhaps by a faculty member visiting from another institution. Students may therefore enroll repeatedly in a course with this number.

1-3 units


3 units (Golub)

337. Numerical Methods for Initial Boundary Value Problems—Initial boundary value problems are solved in different areas of engineering and science modeling phenomena, e.g., wave propagation and vibration, fluid flow, etc. Numerical techniques for such simulations are discussed in the context of applications. Emphasis is on stability and convergence theory for methods for hyperbolic and parabolic initial boundary value problems, and the development of efficient methods for these problems.

3 units, Spr (Staff)

339. Topics in Numerical Analysis—Advanced material is often taught for the first time as a "topics" course, perhaps by a faculty member visiting from another institution. Students may therefore enroll repeatedly in a course with this number. See Time Schedule for current topics.

2-3 units, Aut (Van Huffel) alternate years, not given 2001-02

Win (Golub)

341. Advanced Topics in Data Communication—Readings/discussion are combined with topical lectures to familiarize students with a core of classic and new papers in the field of data networking. Emphasis is on understanding and applying existing work to new problems in the field, especially high-speed networking. Topics: network theory (the end-to-end argument), transport protocol performance (header prediction, checksum efficiency), cell relay (e.g., ATM and SONET), congestion control (Parekh's thesis, leaky bucket, fair queueing) and high-speed switching (input vs. output queueing, crossbars and banyans). Prerequisite: 244A.

3 units (Partridge)

342. Programming Language Design—Problems of programming language design and comparison of traditional solutions. Possible topics: formal semantics, implementation considerations, extensibility, very high level languages, evaluation of language designs, the innovative features of a variety of modern programming languages. Prerequisites: 242, 243.

3 units (Mitchell)

343. Topics in Compilers—Advanced topics in compilers. Topics change every quarter; course may be taken repeatedly for credit. Prerequisite: 243.

3 units, Spr (Lam)

344. Projects in Computer Networks—For students with a strong interest in computer networks from novel applications to physical layer coding schemes; software to hardware; theory to design-and-build. Teams of two or more complete a small research project of sufficient quality and interest to merit presentation at a conference, or to form the basis of a new business, e.g., studies of network traces, network traffic visualization tools, home-networking, analysis of performance of cable-modems, novel web applications, or novel router architecture. Enrollment limited to 20. Prerequisites: 244A; or Electrical Engineering 284
346. Database System Implementation—A major database system implementation project realizes the principles and techniques covered in earlier courses. Students independently build a complete database management system, from file structures through query processing, with a personally designed feature or extension. Lectures on project details and advanced techniques in database system implementation, focusing on query processing and optimization. Guest speakers from industry on commercial DBMS implementation techniques. Prerequisites: 145, 245. Recommended: programming experience in C++.

3 units, Spr (Staff)

347. Transaction Processing and Distributed Databases—The principles and system organization of distributed databases. Data fragmentation and distribution, distributed database design, query processing and optimization, distributed concurrency control, reliability and commit protocols, and replicated data management. Distributed algorithms for data management: clocks, deadlock detection, and mutual exclusion. Heterogeneous and federated distributed database systems. Overview of commercial systems and research prototypes. Prerequisites: 145, 245.

*4 units, Win (Guibas)


*4 units, Win (Guibas)

348B. Computer Graphics: Image Synthesis Techniques—Intermediate level, emphasizing the sampling, shading, and display aspects of computer graphics. Topics: local and global illumination methods including radiosity and distributed ray tracing, texture generation and rendering, volume rendering, strategies for anti-aliasing and photorealism, human vision and color science as they relate to computer displays, and high-performance architectures for graphics. Written assignments and programming projects. Prerequisite: 248 or equivalent. Recommended: exposure to Fourier analysis or digital signal processing.

*4 units, Spr (Hanhrahan)

348C. Computer Graphics: Animation Techniques—Overview of computer animation techniques. Topics: traditional principles of animation, physical simulation, procedural methods, and motion capture based animation. Focus is on computer science aspects of animation. The basics, e.g., kinematic and dynamic modeling techniques to exploration of current research topics such as motion re-targeting, learning movements and behaviors, and video based modeling and animation. Hands-on animation experience through class projects.

3 units, SPR (Bregler)


1-3 units (Heeger) alternate years, given 2001-02

* May be taken for 3 units by graduate students.

349. Topics in Programming Systems—Advanced material often taught for the first time as a "topics" course, perhaps by a faculty member visiting from another institution. Students may enroll repeatedly in a course with this number. See Time Schedule for topics currently being offered.

3 units, Spr (Prabhakar)

351. Topics in Complexity Theory and Lower Bounds—Focus is on one of: basic machine models and complexity measures—their properties and relationships, complexity classes and their properties, reductions and complete problems, concrete representative problems from important complexity classes. Techniques for establishing limits on the possible efficiency of algorithms, and concrete lower bounds based on the following models of computation: decision trees, straight line programs, communication games, branching programs, PRAMs, boolean circuits. Approximation algorithms and the complexity of approximations. Pseudo-randomness and cryptography. Prerequisite: 154, or equivalent.

3 units (Motwani) alternate years, given 2001-02


3 units, Aut (Widom)


3 units, Aut (Pratt)

354. Probabilistic Reasoning in Computing—The basics of (Bayesian) probability theory as applied to computing and intelligence systems. Emphasis is on working through applications and understanding relevant theory. Relevant probability theory and techniques: interpretations, graphical and network models, information theory, decision theory, inference, and "alternative" approaches. Probabilistic aspects of computational problems in learning, search, data analysis, neural, and dynamic systems. Some topics by guest lecturers. Prerequisites: 106B or 106X, 221, a knowledge of basic statistical measures as in Psychology 60, and basic math.

3 units (Staff)

355. Advanced Topics in Cryptography—For graduate students. Topics: pseudo-random generation, zero knowledge protocols, elliptic curve systems, threshold cryptography, security analysis using random oracles, lower and upper bounds on factoring and discrete log. Prerequisite: 255.

3 units, Spr (Boneh)

356. Automatic Formal Verification Techniques—Automatic methods for formally verifying hardware, protocol, and software system designs. Topics: state graph and automata models of system behavior. Automata on infinite strings. Linear and branching-time temporal logic. Model-checking. Modeling real-time systems. Analysis methods based on Boolean formulas, and other ways of coping with the "state explosion problem." Exploiting abstractions. Applications to circuits, algorithms,
and protocols. Case studies use a variety of verification tools. Prerequisites: 154 or 254. Recommended: good understanding of basic automata and complexity theory, and undergraduate-level background in computer science.

3 units (Dill) alternate years, given 2001-02


3-5 units, Spr (Manna, Sipma)

358. Topics in Programming Language Theory—Possible topics of current research interest in the mathematical analysis of programming languages: structured operational semantics, domain theory, semantics of concurrency, rich type disciplines, problems of representation independence, and full abstraction. May be repeated for credit. Prerequisites: 154, 157, 258, or equivalents.

3 units (Mitchell)

359. Topics in Theory of Computation—Advanced material is often taught for the first time as a “topics” course, perhaps by a faculty member visiting from another institution. Students may therefore enroll repeatedly in a course with this number. See Time Schedule for topics currently being offered.

361A. Advanced Algorithms—Advanced data structures: union-find, self-adjusting data structures and amortized analysis, dynamic trees, Fibonacci heaps, universal hash function and sparse hash tables, persistent data structures. Advanced combinatorial algorithms: algebraic (matrix and polynomial) algorithms, number theoretic algorithms, group theoretic algorithms and graph isomorphism, on-line algorithms and competitive analysis, strings and pattern matching, heuristic and probabilistic analysis (TSP, satisfiability, cliques, colorings), local search algorithms. Prerequisite: 161 or 261, or equivalents.

3 units (Motwani) alternate years, given 2001-02


3 units, Spr (Plotkin) alternate years, not given 2001-02

365. Randomized Algorithms—Design and analysis of algorithms that use randomness to guide their computations. Basic tools, from probabilistic theory and probabilistic analysis, that are recurrent in algorithmic applications. Randomized complexity theory and game-theoretic techniques. Algebraic techniques. Probability amplification and derandomization. Applications: sorting and searching, data structures, combinatorial optimization and graph algorithms, geometric algorithms and linear programming, approximation and counting problems, parallel and distributed algorithms, on-line algorithms, number-theoretic algorithms.

Prerequisites: 161 or 261, Statistics 116, or equivalents.

3 units (Motwani) alternate years, not given 2001-02

367A. Parallel Computation—Introduction to theoretical issues in parallel computation. Properties of parallel computation models and algorithm design techniques specific to each model, including systolic arrays, mesh-connected computers, hypercube-related networks, and PRAM. Topics: algorithms for sorting, connected components, shortest paths, and other basic problems. Upper and lower bounds for randomized and deterministic routing on hypercube and related networks. Techniques for reducing the processor-time product for PRAM algorithms.

3 units (Plotkin)


3 units (Plotkin)

368. Geometric Algorithms—Graduate-level introduction to the basic techniques used in the design and analysis of efficient geometric algorithms including: convexity, triangulation, sweeping, partitioning, and point location. Voronoi and Delaunay diagrams. Intersection and visibility problems. Recent developments using random sampling methods. Emphasizes data structures of general usefulness in geometric computing and the conceptual primitives appropriate for manipulating them. Impact of numerical issues in geometric computation. Applications to motion planning, visibility preprocessing, model-based recognition, and GIS. Prerequisite: 161.

3 units, Spr (Guibas)

369. Topics in Analysis of Algorithms—Advanced material is often taught for the first time as a “topics” course, perhaps by a faculty member visiting from another institution. Students may therefore enroll repeatedly in a course with this number. See Time Schedule for topics currently being offered.

3 units

377. Topics in Human-Computer Interaction—Topics of current research interest in human-computer interaction. Contents change each quarter. May be repeated for credit.

3-4 units, Aut, Win, Spr


3-4 units, Spr (Winograd)

379. Interdisciplinary Topics—Advanced material that relates computer science to other disciplines is often taught for the first time as a “topics” course, perhaps by a faculty member visiting from another institution. Students may therefore enroll repeatedly in a course with this number. See Time Schedule for topics being currently offered.

by arrangement

390A,B,C. Curricular Practical Training—Provides educational opportunities in high-technology research and development labs in the computing industry. Qualified computer science students engage in internship work and integrate that work into their academic program. Students register during the quarter they are employed and must complete a research report outlining their work activity, problems investigated, key results, and any follow-on projects they expect to perform. Meets the requirements for Curricular Practical Training for students on F-1 visas. 390 A, B and C may each be taken only once.

1 unit, any quarter (Motwani)

393. Computer Laboratory—For CS graduate students. A substantial computer program is designed and implemented; written report required.
394. Business Management for Computer Scientists and Electrical Engineers—Focus is on the functional areas necessary for making successful business decisions. Topics: corporate strategy, new product development, marketing, sales, distribution, customer service, and financial accounting. How to identify and analyze issues in each of these areas in a rapidly changing world. A framework and tool set is developed for formulating, evaluating, and recommending action from the general manager point of view and for communicating and defending ideas in a team environment. Enrollment limited to 60. See http://www-leland.stanford.edu/class/cs394/. Prerequisite: graduate student in Computer Science or Electrical Engineering.

3-4 units (Gibbons, Liddle) not given 2000-01

395. Independent Database Project—For graduate students in Computer Science. Use of database management or file systems for a substantial application or implementation of components of database management system. Written analysis and evaluation required. Register using the section number associated with the instructor. Prerequisite: consent of instructor.

any quarter (Staff)

399. Independent Project

1-9 units, any quarter (Staff)

399P. Independent Project—Graded satisfactory/no credit.

1-9 units, any quarter (Staff)

EXPERIMENTAL

409. Formal Software Development—Introduction to formal methods for software development and the automation of these methods. Focus is on the composition of large formal specifications, and the refinement of specifications into efficient code. The foundations for specification composition and refinement are provided by category-theoretic concepts, e.g., colimits and sheaves. Topics: application-specific domain theories, formal refinement specifications, representation and use of programming knowledge, software architectures, algorithm and data structure design, program optimization techniques, datatype refinement, code generation, and system support. Hands-on exercises with a working system.

3 units (Smith, Green) alternate years, given 2001-02

426. Genetic Algorithms and Genetic Programming—The genetic algorithm is a domain-independent algorithm for search, optimization, and machine learning patterned after Darwinian natural selection and naturally occurring genetic operators such as recombination; mutation; gene duplication, deletion, regulation; and embryonic development. Genetic programming is a domain-independent automatic programming technique that extends the genetic algorithm to the breeding of populations of computer programs capable of producing human-competitive results. Topics: introduction to genetic algorithms and genetic programming; the mathematical basis for genetic algorithms; implementation on parallel computers and field-programmable gate arrays; applications to problems of system identification, control, classification, analysis of genome and protein sequences; automatic synthesis of the design of topology, sizing, placement, and routing of analog electrical circuits; automatic synthesis of controllers; and automatic synthesis of other complex network structures.

3 units, Spr (Kosar)

444N. Mobile and Wireless Networks and Applications—How mobility affects networks, systems, and applications. Mobility of devices and end-users has behavioral implications at all layers of the traditional Internet protocol stack, from the MAC layer up through the application layer. Handling mobility efficiently requires more information sharing between network layers than is typically considered. Topics: how mobility affects the layers of the protocol stack; and how it affects different functional aspects of systems, including security, privacy, file systems, resource discovery, resource management (including energy usage), personal on-line identities, and other areas. Emerging applications enabled by mobility. "Traditional" wireless networks, in which an underlying infrastructure is assumed; ad hoc mobile wireless networks, in which nodes may come and go and must form their own network infrastructure on the fly. Student groups design and implement mobile applications and system features of their choosing using network technologies such as WaveLAN, Metricom’s Ricochet network, the Palm-7, and Bluetooth. Prerequisites: 240, 244A, 244B, or equivalents.

3 units (Baker) not given 2000-01

447. Interdisciplinary Interaction Design—(Same as Mechanical Engineering 293.) Small teams develop innovative technology prototypes that combine product and interaction design. Focus is on software and hardware interfaces, interaction, design aesthetics, and some underpinnings of successful design: a reflective, interactive design process, group dynamics of effective interdisciplinary teamwork, and working with users. Prerequisite: 247A.

3-4 units, Spr (Winograd, Kelley)

448. Topics in Computer Graphics—In-depth study of an active research topic in computer graphics. Topic changes each quarter, e.g., exotic input and display technologies, graphics architectures, topics in modeling shape and motion, experiments in digital television, interactive workplaces, introduction to hand-drawn cartoon animation. Readings from literature and a project. May be taken repeatedly for credit. Prerequisite: 248 or consent of instructor.

3 units, Aut (Bregler)

448A. Experiments in Motion Capture

3 units, Aut (Bregler)

448B. Motion Study: An Introduction to Animation, Cartoon Physics, and Funny Walks—Preference to CS students with a graphics or animation specialization, and Art students from the Digital Arts program. Hands-on animation, providing a foundation for future work in computer graphics, digital art, and animation. The techniques, tools, and methods used by traditional animators. Through lectures, hands-on exercises, motion analysis, and screenings, students learn a variety of animation techniques and gain a basic control of timing, spacing, weight, and expressive motion. At the end of quarter, students have a short reel of their work plus new insight into the art of animation.
468. Topics in Geometric Algorithms—Advanced seminar covering different topics related to geometric computing. Recent offerings: shape matching, proximity and nearest-neighbor problems, visibility and motion planning, and collision detection. Readings from the literature and a presentation or a project required. May be taken multiple times for credit. Prerequisite: 368, or consent of instructor.

448C. Interactive Workplaces

499. Advanced Reading and Research—For CS graduate students. Register using the section number associated with the instructor. Prerequisite: consent of instructor.

GRADUATE SEMINARS

510. Digital Systems Reliability Seminar—(Enroll in Electrical Engineering 385A.)
1-4 units, Aut, Win, Spr, Sum (McClusky)

523. Readings in Artificial Intelligence—Primarily for students planning to take the AI qualifying exam. A series of lectures and discussions on readings in all areas of artificial intelligence research. Prerequisite: 221.
3 units, Win (Staff)

525. Seminar on Knowledge Acquisition for Expert Systems—(Enroll in Biomedical Informatics 230.)
2 units, Spr (Musen) alternate years, not given 2001-02

528. Broad Area Colloquium for Artificial Intelligence, Geometry, Graphics, Robotics, and Vision—Weekly series of informal research talks on topics related to perceiving, modeling, manipulating, and displaying the physical world. The computational models and numerical methods underlying these topics. Brings together faculty and students in these five closely related areas. (AU)
1 unit, Aut, Win, Spr (Staff)

530. Applied Mathematics/Scientific Computing Seminar—(AU)
1 unit, Aut, Win, Spr (Staff)

1 unit, Aut, Win, Spr (Staff)

540. Seminar on Computer Systems—(Enroll in Electrical Engineering 380.)
1 unit, Aut, Win, Spr (Allison, Wharton)

545. Database Research Seminar—Presentations of current research and industrial innovation in information systems, sponsored by Infolab faculty. Topics: fundamental database technology, digital libraries, knowledge-based processing and advanced applications. Interaction with speakers. (AU)
1 unit, Aut, Spr (Wiederhold, Decker)

545I. Advanced Image Databases Seminar—Reading/demonstrations/analysis devoted to image and video databases as created by photographic, medical, and commercial sources. Emphasis is on combining image-derived and textual descriptors to retrieve on-line images. Issues: data structures and indexing schemes for real-time interaction, high-dimensional feature vectors for fast retrieval, metrics of closeness between query and stored vectors. Presentations by commercial and research image retrieval organizations illustrate the strengths and weaknesses of specific techniques. May be combined with a 395 project. (AU)
1 unit, Win (Firschein, Wiederhold)

547. Human-Computer Interaction Seminar—Weekly speakers on topics related to human-computer interaction design. (AU)
1 unit, Aut, Win, Spr (Winograd)

548. Distributed Systems Research Seminar—Recent research in distributed operating systems, computer communications, parallel machines, parallel programming, and distributed applications. Invited speakers from Stanford and elsewhere present topics and results of current interest. (AU)
1 unit, Spr (Staff)

559. Seminar on Mathematical Theory of Computation—Possible topics (vary each year): logic and its relation to computation, programming language analysis and design, specification and verification of software and hardware systems, theories of concurrency, approaches to static analysis and program state. Invited speakers present recent results and summaries of articles from the current literature. (AU)
1 unit, by arrangement (Mitchell)

579. Frontiers in Interdisciplinary Biosciences—Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible. Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford's Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.
2 units, Aut, Win, Spr (S. Block)
Associate Professors: Nicholas Bambos, John T. Gill III, Gregory T. A. Kovacs, Marc S. Levoy, Bruce B. Lusignan, Dwight G. Nishimura, Oyekunle Olukotun, Jennifer Widom, Howard A. Zebker
Assistant Professors: Mary G. Baker, Dan Boneh, Dawson Engler, Andrea J. Goldsmith, Thomas H. Lee, Nicholas McKeown, Balaji Prabhakar, Olav Solgaard, Benjamin VanRoy, Shan X. Wang
Professors (Research): David M. Bloom, Antony Fraser-Smith, James F. Gibbons, Butrus T. Khuri-Yakub, Arogyswami J. Paulraj, Piero A. Pianetta, Calvin F. Quate

Curtesy Professors: Malcolm R. Beasley, David Cherten, David L. Dill, Gary Glover, Gene Golub, Monica S. Lam, John McCarthy, Norbert Felc, Vaughan R. Pratt, Jeffrey Ullman, Brian Wandell
Curtesy Associate Professors: Per Enge, Peter Fitzgerald, David Heeger, Sandy Napol, Mendel Rosenblum, Zhi-Xun Shen, Julius Smith, Daniel Spielman
Curtesy Assistant Professors: Stacey Bent, Armando Fox, Claire Tomlin
Curtesy Professor (Teaching): Gilbert Masters
Acting Assistant Professor: Glen Solomon

Lecturers: Dennis Allison, Richard Dasher, Dieter Scherer, Howard Swain, John Wharton
Consulting Professors: Carl Berglund, Elizabeth Cohen, Bruce Deal, Abbas Emami-Naeini, Timothy Groves, Sam Haddad, Kiyoo Itoh, Theodore Kamins, Masahiro Kawahata, Else Kooi, John Koza, Jason G. Krishnayya, David Leeson, Michael Marhic, Mark McCord, Dan Meabiourger, Roger D. Melen, Madhally Narasimha, Yoshio Nishi, Kurt Petersen, Richard Reis, Donald Scharfetter, S. Venkat Shastri, Arden Sher, James Spilker, Jr., David Stork, John Wakerly, Martin Walt, John Woods
Consulting Associate Professors: Judy Hoyt, Brian Marcus, Carol Blue Muller, Yi-Ching Pao, Nirmal Saxena, Noel Thompson
Consulting Assistant Professors: John Apostolopoulos, Ahmed Bahai, David Burns, Isaac Chuang, Santiago Fernandez-Gomez, Nam Maluf, Steven Minne, Mehrdad Moslehi, M. Allen Northrup, Eckehard Steinbach, David Su, Susie Wee
Visiting Professors: Jacob Abraham, Abdullah Atalar, Yeheskel Bar-Ness, Ming-Jer Chen, Stewart Gillmor, Byoung Yoon Kim
Visiting Associate Professors: Pao-Chi Chang, Jeong-A Lee, Jicheng Hu, Mustafa Karaman, Hari Kuchibhotla, Tokumo Ogunfunmi
Visiting Assistant Professors: Luca Benini, Marie-Laure Boucheret

UNDERGRADUATE PROGRAMS

The mission of the Undergraduate Program of the Department of Electrical Engineering is to augment the liberal education expected of all Stanford undergraduates and impart a basic understanding of electrical engineering built on a foundation of physical science, mathematics, computing, and technology.

Graduates of the undergraduate program are expected to possess knowledge of the fundamentals of electrical engineering and of at least one specialty area. The graduates are expected to have the basic experimental, design, and communication skills to be prepared for continued study at the graduate level or for entry level positions that require a basic knowledge of electrical engineering, science, and technology.

The educational objectives of the program are:

1. Technical Knowledge: provide a basic knowledge of electrical engineering principles along with the required supporting knowledge of computing, engineering fundamentals, mathematics, and science. The program must include depth in at least one specialty area, currently including Computer Hardware, Computer Software, Controls, Electronics, Fields and Waves, and Communication and Signal Processing.

2. Laboratory and Design Skills: develop the basic skills needed to perform and design experimental projects. Develop the ability to formulate problems and projects and to plan a process for solution, taking advantage of diverse technical knowledge and skills.

3. Communications Skills: develop the ability to organize and present information and to write and speak effective English.

4. Preparation for Further Study: provide sufficient breadth and depth for successful subsequent graduate study, post-graduate study, or lifelong learning programs.

5. Preparation for the Profession: provide an appreciation for the broad spectrum of issues arising in professional practice, including economics, ethics, leadership, professional organizations, safety, service, and teamwork.

To specialize in Electrical Engineering (EE), undergraduate students should follow the depth sequence given in the discussion of undergraduate programs in the “School of Engineering” section of this bulletin. Majors must receive at least a 2.0 grade point average (GPA) in courses taken for the EE depth requirement.

For information about an EE minor, see the “School of Engineering” section of this bulletin.

A Stanford undergraduate may work simultaneously toward the B.S. and M.S. degrees. See the “School of Engineering” coterminal section of this bulletin.

GRADUATE PROGRAMS

University regulations governing the M.S., Engineer, and Ph.D. degrees are described in the “Graduate Degrees” section of this bulletin.

The profession of electrical engineering demands a strong foundation in physical science and mathematics, a broad knowledge of engineering techniques, and an understanding of the relationship between technology and man. Curricula at Stanford are planned to offer the breadth of education and depth of training necessary for leadership in the profession. To engage in this profession with competence, four years of undergraduate study and at least one year of postgraduate study are recommended. For those who plan to work in highly technical development or fundamental research, additional graduate study is desirable.

A one-year program of graduate study in electrical engineering may lead to the degree of Master of Science. A two-year program, offering a wider selection of engineering coursework, more opportunity for study in the related fields of engineering, mathematics, and physics, and in particular, more independent work and individual guidance, may lead to the degree of Engineer.

The degree of Doctor of Philosophy is offered under the general regulations of the University. The doctoral program, requiring a minimum of three years (nine quarters) of graduate study, should be considered by those with the ability and desire to make a life work of research or teaching.

Application for Admission—Applications for admission with graduate standing in Electrical Engineering (EE) can be completed electronically at http://www.stanford.edu/dept/registrar/admissions/apply info.html#electronic, or a printed application may be obtained by writing to Graduate Admissions, the Registrar’s Office, Old Union, Stanford, CA 94305-3005 or by calling (650) 723-4291. Applications are submitted to and reviewed by the Department of Electrical Engineering, Graduate Admissions Office, 350 Serra Mall, Stanford University, Stanford, CA 94305-9505. Applications for full-time study are considered for the Autumn Quarter only. The application deadline is December 15.

Applicants who have not yet earned the equivalent of an M.S. degree should apply for admission to study first toward the master’s degree, indicating any intention of later working toward a more advanced degree. Admission for either the Engineer or Ph.D. degree is normally available only to students who have completed a master’s degree. In addition, candidacy to the Engineer or Ph.D. degree also requires that the department’s Committee on Graduate Admissions identify a tentative faculty research supervisor.

MASTER OF SCIENCE

Modern electrical engineering is a broad and diverse field, and graduate education in this department may satisfy a variety of objectives. Students with undergraduate degrees in physics, mathematics, or related sciences, as well as in various branches of engineering, are invited to apply for admission. They will ordinarily be able to complete the master’s degree in one calendar year. Students with undergraduate degrees in other fields may also be admitted for graduate study (see below).
Electrical Engineering at Stanford University

The master's degree program may provide advanced preparation for professional practice or for teaching on the junior college level, or it may serve as the first step in graduate work leading to the degree of Engineer or Ph.D. The faculty does not prescribe specific courses to be taken. Each student, with the help of a program adviser, prepares an individual program and submits it to the faculty for approval. The master's program proposal must be submitted to the department office during the first quarter of graduate study; modifications may be made later. Detailed requirements and instructions are in the Handbook for Graduate Students in Electrical Engineering at Stanford University (http://ee.stanford.edu/ee/GradHandbook/html/GradHandbook/html).

Programs of at least 45 quarter units that meet the following guidelines are normally approved:

1. A sequence of three or more graded-electrical engineering courses numbered above 200, to provide depth in one area. The student must maintain an average 3.0 grade point average (GPA) or better in both the depth area and overall.

2. At least one EE course numbered above 200 in each of three additional course areas, outside of the area selected under item 1 to provide breadth.

3. Enough additional units of electrical engineering courses so that items 1 through 3 total at least 21 units of graded EE courses numbered above 200, including at least 9 units of such courses numbered in the 300s or 400s. Some 600- or 700-level summer courses may also be considered for inclusion in the M.S. program.

4. Additional course work to bring the total to 45 or more quarter units, including:
   a) at least 36 graded units
   b) at least 36 units at or above the 100 level
   c) at least 30 units in technical areas such as engineering, mathematics, and science; thesis and Special Studies units cannot be included among these 30 units

5. At least three quarters of EE seminars, including 201 in Autumn Quarter. In case of time conflicts, tapes of these classes can be viewed in the Terman Library.

Capable students without formal undergraduate preparation in electrical engineering may also be admitted for graduate study. Such students may have graduated in any field and may hold either the B.S. or A.B. degree. Each student, with the help of an adviser, prepares a program of study to meet his or her particular needs and submits it to the faculty for approval. A student with adequate preparation in mathematics through calculus and college physics including electricity can usually complete the M.S. degree requirements within two academic years. A student with some additional preparation in electrical engineering may be able to complete the M.S. requirements in only one academic year.

Graduate study in electrical engineering demands that students be adequately prepared in circuits, digital systems, electronics, fields, lab work, mathematics, and physics. Skill in using modern computing facilities is essential for electrical engineers, and an increasing number of our courses routinely require it. Skill should be acquired early in the program, either by taking one of the regular computer science courses or one of the special "short courses" given by the Computation Center, or by self-study.

It is the student's responsibility, in consultation with an adviser, to determine whether the prerequisites for advanced courses have been met. Prerequisite courses ordinarily taken by undergraduates may be included as part of the graduate program of study. However, if the number of these is large, the proposed program should contain more than the typical 45 units, and the time required to meet the degree requirements may be increased.

Permission to study beyond the M.S. degree must be obtained from the department (if possible, well before the M.S. degree is received). The student needs to file a Graduate Program Authorization Petition. Permission is predicated on the applicant's academic record, performance in independent work, potential for advanced study, and on the ability of the faculty to supervise such study. For the most recent information, see http://ee.stanford.edu/ee/GradHandbook/html/ms.html.

M.S. PROGRAM IN ELECTRICAL ENGINEERING (EE) AND MANAGEMENT SCIENCE AND ENGINEERING (MS&E)

Admission—For the dual degree, admission to both departments is required, but is coordinated by designated members of both Admissions Committees who make recommendations to the committees of their respective departments.

Advising—Every student in the dual degree program has one adviser in EE, and one in MS&E. In addition, a committee consisting of designated faculty from both departments serves as a review committee on performance and as an overseeing body of ongoing and graduating students of the program. The committee, consisting of designated members of both Admission Committees as described in the previous section, may initially serve as this overseeing body.

The Dual Degree Program—This dual-degrees program enables a small, selective set of graduate students to obtain both the MS&E master's degree and the EE master's degree simultaneously. Students complete the course requirements for each department. However, the total number of units required to complete the dual-degree is 72 (versus 90 if the two degrees were pursued separately), and the total number of full-time quarter residency equivalents required to complete the dual degree is six (students with a 50 percent teaching or research assistantship, who average 9 units per quarter, earn .62 of a full quarter of residence).

ENGINEER

The degree of Engineer requires a minimum of two academic years (90 quarter units) of study beyond the B.S. degree (three academic quarters beyond the M.S.) including six full-time quarters of approved work as a graduate student, of which a minimum of three quarters and 36 quarter units must be in residence at Stanford.

Work toward the degree of Engineer in Electrical Engineering normally includes the requirements for work toward the master's degree in Electrical Engineering, including qualifications for admission.

An additional year allows time for a broader program, or a more concentrated program, or whatever arrangement may seem suitable to the candidate, his adviser, and the department. Advanced study at other universities, or in other departments at Stanford, may be allowed within the foregoing consideration. The equivalent of approximately one quarter is devoted to independent study and thesis work with faculty guidance. The thesis is often of the nature of a professional report on the solution of a design problem. The degree of Engineer differs from the Ph.D. in that it prepares for professional engineering work rather than theoretical research. The candidate may select courses that are suitable for either the degree of Engineer or the Ph.D. degree and decide later which program to pursue.

The best procedure for the applicant to follow is (1) if now working toward the Stanford M.S. degree in Electrical Engineering, request permission to continue graduate studies beyond the master's degree, using the Graduate Program Authorization Petition form obtained from the Department of Electrical Engineering office, or (2) if not planning to receive the Stanford M.S. degree in Electrical Engineering, apply for admission to the Department of Electrical Engineering as a candidate for the degree of Engineer.

During the first quarter of work beyond the M.S. degree, formal application for admission to candidacy for the degree of Engineer is made on a form that can be obtained from the department office. The program of study is prepared by the student with the help of the thesis adviser and submitted to the academic associate for approval. The form should contain a list of all graduate courses completed at Stanford and elsewhere and all courses yet to be completed. For the most recent information, see http://ee.stanford.edu/ee/GradHandbook/html/engineer.html.

DOCTOR OF PHILOSOPHY

Admission to a graduate program does not imply that the student is a candidate for the Ph.D. degree. Advancement to candidacy requires superior academic achievement, satisfactory performance on a qualifying examination, and sponsorship by two faculty members. Enrollment in Electrical Engineering 391, Special Studies, is recommended as a means...
for getting acquainted with a faculty member who might be willing to serve as a supervisor.

Not later than the first Autumn Quarter after receiving the M.S. degree, the applicant should submit an application to take the department qualifying examination (given each Winter Quarter). Upon successful completion of the qualifying examination and after securing agreement by two faculty members to serve as dissertation advisers, the student should file an Application for Doctoral Candidacy. Only after receiving department approval to that application does the student become a candidate for the Ph.D. degree.

Requirements may be summarized as follows. The student must complete successfully (1) a minimum of three years of residence with graduate standing, two years of which must be in residence at Stanford; (2) one or more qualifying examinations given by the faculty of the Department of Electrical Engineering; (3) an approved program of courses in electrical engineering and allied subjects; (4) an approved topic of research and a written dissertation, based on research, which must be a contribution to knowledge; (5) an oral examination that is a defense of dissertation research and is taken near the completion of the doctoral program.

About one-fourth of the program of graduate study should be in departments other than Electrical Engineering. Courses shall be selected to form an integrated program, to be approved by the department. A student wishing to fulfill the requirements for a formal minor may elect to do so. For the most recent information, see http://ee.stanford.edu/ee/GradHandbook/html/phd.html.

**FINANCIAL ASSISTANCE**

The department annually awards a limited number of fellowships, teaching assistantships, and research assistantships to incoming graduate students. The fellowships are usually awarded only to first-year graduate students in the EE Master of Science program. Most awards to Engineer and Ph.D. candidates are research assistantships, which are awarded by individual faculty research supervisors working in conjunction with the department's Ph.D. Degree Committee. A grade point average (GPA) of at least 3.35 on these courses is required.

**THE HONORS COOPERATIVE PROGRAM**

Many of the department's graduate students are supported by the Honors Cooperative Program (HCP), which makes it possible for academically qualified engineers and scientists in nearby companies to be part-time graduate students in Electrical Engineering while continuing nearly full-time professional employment. Prospective HCP students follow the same admission process and must meet the same admission requirements as full-time graduate students. For more information regarding the Honors Cooperative Program, see the "School of Engineering" section of this bulletin.

**AREAS OF RESEARCH**

Candidates for advanced degrees participate in the research activities of the department as paid research assistants or as students of individual faculty members. At any one time, certain areas of research have more openings than others. A new applicant should express a second choice of research interest in the event that there are no vacancies in the primary area of interest. At present, faculty members and students are actively engaged in research in the areas listed below.

### COMPUTER SYSTEMS

- Asynchronous Circuits
- Compilers
- Computer-Aided Design
- Computer Architecture
- Computer Graphics
- Computer Networks
- Computer Organization
- Computer Reliability
- Concurrent Languages
- Concurrent Processes and Processors
- Database and Information Systems
- Distributed Systems
- Embedded System Design
- Hardware/Software Co-Design
- Hardware Verification
- Human Computer Interaction
- Multimedia Systems
- Operating Systems
- Performance Measurement and Modeling
- Programming Languages
- Program Verification
- Software Engineering
- VLSI Design

### INFORMATION SYSTEMS

- Adaptive Control and Signal Processing
- Adaptive Neural Networks
- Biomedical Signal Analysis
- Computer-Aided Design and Analysis of Systems
- Data Communications
- Digital Signal Processing
- Estimation Theory and Applications
- Fourier and Statistical Optics
- Information and Coding Theory
- Medical Imaging and Image Processing
- Multivariable Control
- Optical Communications
- Optimization-Based Design
- Pattern Recognition and Complexity
- Quantization and Data Compression
- Real-Time Computer Applications
- Signal Processing Algorithms and Architectures
- Speech and Image Coding

### INTEGRATED CIRCUITS

- Analog Integrated Circuits
- Bipolar, MOS, and other Device and Circuit Technologies
- CAD of Processes, Devices, and Equipment
- Custom Integrated Circuits for Computers and Telecommunications
- Digital Integrated Circuits
- Integrated Sensors and Actuators
- Mixed Signal Integrated Circuits
- Nanostructures
- Optoelectronic Integrated Circuits
- Process, Device, Circuit, and Equipment Modeling
- Sensors and Control for VLSI Manufacturing
- VLSI Device Structures and Physics
- VLSI Fabrication Technology
- VLSI Materials, Interconnections, and Contacts
- VLSI Packaging and Testing

### LASERS AND QUANTUM ELECTRONICS

- Coherent UV and X-Ray Sources
- Free-Electron Lasers
- Laser Applications in Aeronautics, Biology, Chemistry, Communications, Electronics, and Physics
- Laser Devices and Laser Physics
Nonlinear Optical Devices and Materials
Optoelectronic Devices
Photoacoustic Phenomena
Semiconductor Diode Lasers
Ultrafast Optics and Electronics

MICROWAVES, ACOUSTICS, AND OPTICS
Acoustic Microscopy
Acousto-Optic Devices
Fiber Optics
Holography
Microwave Integrated Circuits and Devices
Nondestructive Testing
Optical Interferometry
Scanning Optical Microscopes

SOLID STATE
Applied and Fundamental Superconductivity
Crystal Preparation: Epitaxy and Ion Implantation, and Molecular Beam Epitaxy
Defect Analysis in Semiconductors
Electron and Ion Beam Optics
Electron Spectroscopy
Experimental Determination of the Electronic Structure of Solids
High Resolution Lithography
Laser, Electron, and Ion Beam Processing and Analysis
Magnetic Information Storage
Magnetic Materials Fundamentals and Nanostructures
Nanostructure Fabrication and Applications
Molecular Beam Epitaxy
Novel Packaging Approaches for Electronic Systems
Optoelectronic Devices
Physics and Chemistry of Surfaces and Interfaces
Semiconductor and Solid State Physics
Solid State Devices: Physics and Fabrication
Ultrasmall Electron and Photodevices

SPACE PHYSICS AND RADIOSCIENCE
Detection of Electromagnetic Fields from Earthquakes
Electromagnetic Waves and Plasmas
Geomagnetically Trapped Radiation
Ionospheric and Magnetospheric Physics
Ionospheric Modification
Lightning Discharges
Lightning-Ionosphere Interactions
Planetary Exploration
Radar Interferometry
Radar Remote Sensing
Radio Wave Scattering
Remote Sensing of Atmospheres and Surfaces
Space Engineering (also see the “Space Science and Astrophysics” section of this bulletin)
Synthetic Aperture Radar Satellites
Ultra-Low Frequency Fluctuations of the Earth’s Magnetic Field
Very Low Frequency Wave Propagation and Scattering

TELECOMMUNICATIONS AND SPACE INFORMATION SYSTEMS
Applied Optics and Optoelectronics
Cellular Radio Systems/Networks
Coherent Optical Communications
Communication Channels
Digital Telephone Switching
Frequency Reuse in Large Wireless Systems
Mobility Issues in Large Networks
Multiple Access Techniques
Multipath Mitigation Techniques
Optical Fiber Communications
Optical Networks
Optoelectronic Components and Systems
Propagation in and around Buildings
Radar Signal Processing
Radiating Systems
Resource Allocation/Channel Assignment/Handoff
RF Excision in Support of Search for Extraterrestrial Intelligence
Satellite Communication Stations
Space Data Management
Spaceborne Radio Receiver Development
Telephone and Data Networks
Wavelength Division Multiplexing
Wireless Local Area Data Networks
Wireless Personal Communication Systems

COURSES
(WIM) indicates that the course meets the Writing in the Major requirements.
(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

Electrical engineering courses are numbered according to the year in which the courses are normally taken.
20-99 first or second year
100-199 third or fourth year
200-299 mezzanine course for advanced undergraduates or graduates
300-399 first graduate year
400-499 second or third graduate year
600-799 special summer courses

The Department of Electrical Engineering (EE) offers courses in the following areas:
Communication Systems
Computer Hardware
Computer Software Systems
Control and Systems Engineering
Electronic Circuits
Electronic Devices, Sensors, and Technology
Fields, Waves, and Radioscience
Image Systems
Lasers, Optoelectronics, and Quantum Electronics
Network Systems
Signal Processing
Solid State Materials and Devices
VLSI Design

UNDERGRADUATE
17Q. Stanford Introductory Seminar: From Chips to Genes—Engineering the MicroWorld—Preference to sophomores. Lectures by instructor on the basic material followed by guest speakers from microelectronics, MEMS, and biotechnology. Reading assignments and student reports. Prerequisites: high school physics, know how a light microscope works, and the length of scales (meter, millimeter, micrometer, nanometer).

1-3 units, Win (Pease)

33Q. Stanford Introductory Seminar: Fun Electrical Engineering Stuff (and how it works)—Preference to sophomores. Prospective electrical engineering students are exposed to the capabilities and possibilities in their field, examining the functions and mechanisms of practical systems (toys, home appliances, computers, industrial and medical equipment), and breaking a problem into manageable pieces, recognizing patterns, and thinking beyond what is first seen. Combined lecture and lab; students disassemble and reassemble basic minimal electronics.

3 units, given 2001-02

44Q. Stanford Introductory Seminar: Physics, History, and Mystery of Lightning—Preference to sophomores. The physical properties
and phenomenology of lightning discharges. The history and mystique of lightning, emphasizing the role of this phenomena in religions and various age-old mythologies. Benjamin Franklin’s experiments and writings on lightning. The societal impacts of lightning in modern times and in the historical past. Different types of lightning, including discharges which occur at high altitudes above thunderclouds, lightning on other planets, lightning in volcanoes, and mysterious forms such as “ball” lightning. The physical properties of lightning and techniques for their measurement.

3 units, given 2001-02

47Q. Stanford Introductory Seminar: Telecommunications and Networks—From Telegraphy to the Internet—Preference to sophomores. Modern communications technology and networking, including the Internet. How the global communications infrastructure evolved from the “plain old telephone service” of 1900 to today’s multimedia “information super-highway.” A historical perspective of the evolution of communications technology, including advancements in communications theory and practical inventions over 200 years. Relevant public policy decisions in the U.S., (the Mann-Elkins Act of 1910 to the Telecommunications Reform Act of 1996). The political goals of these policies, their history with market forces, and their impact on the development and employment of technology.

3 units, Aut (D. Harris)

60Q. Stanford Introductory Seminar: Man vs. Nature—Coping with Disasters using Space Technology—(Same as Geophysics 60Q.) Preference to sophomores. Natural hazards (earthquakes, volcanoes, floods, hurricanes, and fires) affect thousands of people everyday. Twenty years of developments in spaceborne imaging technology help monitor and respond to such disasters more rapidly than in the past, saving lives and money. Understanding the physical processes involved allows us to anticipate and plan for mitigation of the consequences of the disasters. Students consider how these new tools are applied to natural disasters, and how remotely-sensed data are manipulated and analyzed.

3 units, Aut (Zebker)

93Q. Stanford Introductory Seminar: Energy Processes—Preference to sophomores. Serves as preparation for 293A,B. Topics in non-traditional energy processes. Students groups of 2 or 3 each select one topic for further investigations. Progress reports, final report. Discussions on the physics and chemistry of the processes, concentrating on a journalistic description of what is being accomplished in each area and the near term prospects. Prerequisite: interest in science and engineering in the energy area.

3 units, Aut (da Rosa)

101. The Electrical Engineering Profession—Lectures/discussions on topics of importance to the electrical engineering profession. Continuing education, professional societies, intellectual property and patents, ethics, entrepreneurial engineering, and engineering management. Extensive reports for 2 units. (AU)

1-2 units, Aut (Gray)


3 units, Win (El Gamal)


3 units, Aut (Nishimura)

104. Signal Processing and Communication—Introduction to communication systems, Fourier series and Fourier transforms, filtering and signal distortion, time domain and frequency domain analysis, communication channel modulation (FM), digital modulation, noise in communication systems, overview of cellular telephones, satellite systems. Prerequisite: 103.

3 units, Win (Goldsmith)

105. Feedback Control Design—(Enroll in Engineering 105.)

3 units, Aut (Enge)

Win (Franklin)

106. Planetary Exploration—The other worlds of our solar system as revealed by recent space missions. Comparative properties of the terrestrial and Jovian planets; planetary atmospheres, surfaces, interiors, and rings; planetary and satellite orbits and spacecraft trajectories, orbital perturbations; properties of the interplanetary gas, dust, comets, and meteorites. What the planets can tell us about potential terrestrial catastrophes (acid rain, ozone depletion, nuclear winter, runaway greenhouse, collision with an asteroid or large comet). Origin and evolution of planetary systems. Remote sensing from spacecraft at radio, infrared, light, and ultraviolet wavelengths. U.S. and Russian space programs and their comparative engineering and scientific aspects. Prerequisite: one year of college engineering, mathematics, or physics.

3 units, Spr (Fraser-Smith)

111. Electronics I—The fundamental operation of semiconductor devices and their circuit applications. The physical principles of semiconductors, emphasizing silicon technology; operating principles and device equations for PN diodes, biasing, small-signal models, and elementary circuit applications of diodes. Prerequisite: Engineering 40. Corequisite: 101.

4 units, Aut (Wong)

112. Electronics II—Basic operating principles and device equations for MOS capacitors and transistors, and bipolar junction transistors. The basics of transistor amplifier and logic circuit design using MOS transistors. Weekly one-hour recitation session. Prerequisites: 101, 111.

4 units, Win (Wong)

113. Electronic Circuits—Bipolar and MOS amplifier design including DC bias, small signal performance, multistage amplifiers, frequency response, feedback. Design and use of operational amplifiers. Prerequisites: 102, 112.

3 units, Spr (Staff)

121. Digital Design Laboratory—Introduction to digital circuits and logic design. Topics: Boolean algebra, logic circuit electrical characteristics, combinational and sequential logic building blocks, state machines, programmable logic devices, hierarchical logic design, computer-aided design and logic simulation. Lab. Prerequisite: Engineering 40. (WIM)

4 units, Aut (Pearsse)

Win (Gill)

122. Analog Laboratory—Introduces the practical applications of analog circuits, including simple amplifiers, filters, oscillators, power supplies, and sensors. Goals: lab experience, basic design skills, experi-
ence with computer-aided design, and basic circuit fabrication/debugging knowledge. Prerequisite: Engineering 40 or equivalent.

3 units, Aut, Spr (Kovacs)

133. Analog Communications Design Laboratory—The design and testing of analog communications circuits, including applications. Amplitude modulation (AM) using discrete multiplier circuits and fully integrated implementations. Phase and Frequency Modulation (FM) based on discrete and integrated modulator circuits such as voltage-controlled oscillators (VCOs). Phased-Lock Loop (PLL) techniques, characterization of key parameters and their applications. Lectures on the practical aspects of circuit implementations. Labs involve the systematic building and characterization of AM, FM, and PLL circuits and subsystems. Enrollment limited to 40 undergraduate and coterminal EE students. Prerequisite: 122.

3 units, Win (Dutton)

137. Laboratory Electronics—(Enroll in Applied Physics 207.)

138. Laboratory Electronics—(Enroll in Applied Physics 208.)

140. The Earth from Space: Introduction to Remote Sensing—(Enroll in Geophysics 40.)


4 units, Aut (Inan)


3 units, Win (Inan)

144. Wireless Electromagnetic Design Laboratory—Required for undergraduate Fields and Waves specialty area. Lecture, lab, and design project. Hands-on experiments and projects with antennas, transmission lines and propagation for wireless communications and remote sensing. Using spectrum analysers, swept frequency generators, frequency counters, couplers, detectors and slotted lines, develop measurement and design capability in the 1-20 GHz range in support of chosen design projects. Two- to three-person team projects on antenna, guided wave distributed circuits, remote sensing, or related topics. Working model construction and demonstration; some funding available for project costs. Prizes for best projects. Lab. Enrollment limited to 30. Prerequisites: 122, 142, or consent of instructor.

3 units, Spr (Leeson)


168. Introduction to Digital Image Processing—Introduction to processing of digital 2-D and 3-D data, combining theoretical material with implementation of computer algorithms. Topics: time and frequency representations of images, filters, image formation and enhancement, imaging systems, and applications. Computer lab exercises implement practical algorithms.

3-4 units, Win (Zebker)
graduates in industry (large, medium, and small), start-up companies, government laboratories, and community colleges. (AU)

1 unit, Win (Reis)

202. Medical Electronics—Open to non-electrical engineering students. Primarily biological in nature. Introduces electrical engineers to the physiological and anatomic aspects of medical monitoring and imaging. Biological content, transducers, electronic systems, the socioeconomic impact, and the constraints unique to medicine. Recommended: some familiarity with circuits and electrical instrumentation techniques (e.g., 113).

3 units, Aut (Thompson)

203. The Entrepreneurial Engineer—Seminar furthers the knowledge base of prospective entrepreneurs with an engineering background. The contributions made to the business world by engineering graduates. Speakers include Stanford (and other) engineering and M.B.A. graduates who have founded large and small companies in nearby communities. Contributions from EE faculty members and other departments (law, business, and industrial engineering). (AU)

1 unit, Win (Melen)

205. Introduction to Control Design Techniques—(Enroll in Engineering 205.)

206. Control System Design and Simulation—(Enroll in Engineering 206.)

207D. Optimal Control and Hybrid Systems—(Enroll in Aeronautics and Astronautics 278A).

209A. Analysis and Control of Nonlinear Systems—(Enroll in Engineering 209A.)

209B. Advanced Nonlinear Control—(Enroll in Engineering 209B.)

212. Integrated Circuit Fabrication Processes—For students interested in IC design and the influence of fabrication processes, or intending to pursue doctoral research involving use of Stanford’s IC laboratory. Process simulators are used to illustrate concepts and provide a “virtual” lab experience. Topics: the fundamental principles of integrated circuit fabrication processes, physical and chemical models for crystal growth, oxidation, ion implantation, etching, deposition, lithography, and back-end processing. Required for 410. Prerequisite: 112 or equivalent.

3 units, Aut (Plummer)

213. Heat Transfer in Microdevices—(Enroll in Mechanical Engineering 258.)


3 units, Aut (Lee)

216. Principles and Models of Semiconductor Devices—The fundamentals of carrier generation, transport, recombination, and storage in semiconductors. The physical principles of the operation of the p-n junction, metal semiconductor contact, bipolar junction transistor, MOS capacitor, MOS and junction field-effect transistors, and related devices such as CCDs and solar cells. First-order device models that reflect physical principles and are useful for integrated-circuit analysis and design. Prerequisites: 111, 112, or equivalent.

3 units, Aut (Saraswar)

217. Electron and Ion Beams for Semiconductor Processing—Focused and flood beams of electrons and ions are employed for processing semiconductor devices. The generation of such beams including thermionic emission, field-induced emission, first-order focusing, and glow discharge processes. The interactions of such beams with the target, including scattering in solids, the distribution of energy, heating, sputtering, beam-induced etching (including reactive-ion etching) and beam-induced deposition. Introduction to computer modeling of etching and deposition. Prerequisite: 212 or equivalent.

3 units, Spr (Pease) alternate years, not given 2001-02

222. Applied Quantum Mechanics I—Introduction to quantum mechanics, with emphasis on applications in modern devices and systems. Topics: Schrödinger’s equation, eigenfunctions and eigenvalues, operator approach to quantum mechanics, solutions of simple problems (including quantum wells, harmonic oscillators, simple periodic structures), tunneling, calculation techniques (including matrix diagonalization, perturbation theory, variational method), time-dependent perturbation theory (including application to optical absorption), fundamental postulates of quantum mechanics.

3 units, Aut (Miller)

223. Applied Quantum Mechanics II—Continuation of 222, including more advanced topics: spin and identical particles, effective mass theory for semiconductors, annihilation and creation operators, density matrices, introductory quantum optics, and other topics in electronics, optoelectronics and optics. Prerequisite: 222.

3 units, Spr (Miller)

228. Basic Physics for Solid State Electronics—Advanced undergraduate/graduate, introducing the physics underlying modern solid state materials and devices. Topics: the energy band theory of solids, energy bandgap engineering, classical kinetic theory, statistical mechanics, equilibrium and non-equilibrium semiconductor statistics. Prerequisites: 112, Physics 70.

3 units, Aut (J. Harris)

229B. Thin Film and Interface Microanalysis—(Enroll in Materials Science and Engineering 323.)

229D. Introduction to Magnetism and Magnetic Materials—(Enroll in Materials Science and Engineering 347.)

231. Lasers I—Introduction to lasers and how they work, including quantum transitions in atoms, stimulated emission and amplification, rate equations, saturation, feedback, coherent optical oscillation, laser resonators, and optical beams. Limited primarily to steady-state behavior; uses classical models for atomic transitions with little quantum mechanics background required. Prerequisites: electromagnetic theory to a level of at least 142, preferably 241, and some knowledge of atomic or modern physics such as Physics 57 or 130-131.

3 units, Aut (Solgaard)

232. Lasers II—Continuation of 231, emphasizing dynamic and transient effects including spiking, Q-switching, mode locking, frequency modulation, frequency and spatial mode competition, linear and nonlinear pulse propagation, short pulse expansion, and compression. Prerequisite: 231.

3 units, Aut (Siegman)

238. Electrical and Magnetic Properties of Solids—(Enroll in Materials Science and Engineering 209.)

241. Waves I—Introduction to waves and wave phenomena as they appear in different natural, lab, and application settings. Electromagnetic, acoustic, seismic, atmospheric, plasma, and water waves and their mathematical and physical correspondence in terms of Hamilton's principle. Propagation, attenuation, reflection, refraction, surface and laminar guiding, and intrinsic and structural dispersion; energy density, power flow, and phase and group velocities. Geometric and structural complexities are minimized to stress basic wave concepts common to diverse fields of application. Analysis in terms of transmission line and impedance concepts using exponential notation and vector phasors. Treatment limited to plane harmonic waves in isotropic media. Nonhomogeneous cases limited to plane interfaces and exponentially stratified media. Prerequisite: 142 or equivalent, or other wave course.

3 units, Aut (Tyler)

243. Semiconductor Optoelectronic Devices—Introduction to semiconductor optoelectronic devices for communications and other applications, covering operating principles and practical device features. Review of relevant semiconductor physics, and optical processes in semiconductors. Semiconductor heterostructures. Semiconductor optical detectors (including p-i-n, avalanche, and MSM), light emitting diodes, electroabsorptive modulators (Franz-Keldysh, QCSE), electrorefractive (directional couplers, Mach-Zehnder), switches (SEEDs), and lasers (waveguide and vertical cavity). Prerequisites: basic quantum mechanics, solid state physics, lasers (e.g., 222, 228, 231, or equivalents).

3 units, Win (J. Harris)

244. Communication Engineering Transmission Systems—Design of transmission systems for TV, telephone, and data-using satellites; microwave repeaters; mobile radio; and broadcast transmitters. Performance of FM, AM, SSB common digital schemes and spread-spectrum modulation, time, frequency, and code multiplexing. Emphasis is on link performance, capacity, total system design, and cost optimization. Current industry design problems and research results. Examples illustrate modern technologies providing service to rural populations. Prerequisite: senior or graduate standing in Electrical Engineering, or consent of instructor.

3 units, Aut (Lasignano)

245. Wireless Electromagnetic Design Laboratory—See 144.

3 units, Spr (Leeson)

246. Microwave Engineering—Coherent development of the concepts and applications of distributed circuits. Emphasis is on MI structures (microstrip, coplanar waveguide, slotline, finline, and imageguide) capable of transmitting millimeter wave analog signals and picosecond pulses. Modal properties (TEM, quasi-TEM, TE, TM) of general guide lines. Higher order mode excitation effects at discontinuities (steps, bends, etc.) and junctions are modeled by lumped equivalent circuits, using Z- Y- and S-matrix representations. Dispersion, attenuation, and distributed source excitation in distributed circuits. Analysis of circuit components (impedance transformers, directional couplers, hybrids, circulators, filters, solid state amplifiers). Illustrations of IC circuit structures. Computer-aided design principles. Recommended: 142 or equivalent.

3 units, alternate years, given 2001-02


3 units, Aut (Kazovsky)


3 units, Aut (Yamamoto)

249. Introduction to the Space Environment—Experimentation in the near-earth space environment using radio and other electromagnetic waves, and electric and magnetic instrumentation on space probes. Tools used: transmitters, antennas, receivers, sensors, radars, and displays. The earth's ionosphere, magnetosphere, and interplanetary space. The role of the sun, and the effects produced by changes in solar activity. Geoelectric and geomagnetic fields. Charged particle motion, trapped particles (Van Allen radiation), and the aurora. Applications to current experimental programs. Planning and execution of experiments. Prerequisites: familiarity with electromagnetics at the level of 142 and senior or graduate standing.

3 units, alternate years, given 2001-02


3 units, Spr (Tyler) alternate years, not given 2001-02

254. Principles of Radar Systems—Analysis and design, emphasizing radars as systems. Radar equation and systems parameters, components of radar systems, radar cross-section and target characteristics, signal detection in noise, ambiguity function (with applications to measurement precision, resolution, clutter rejection, and waveform design); pulse compression waveforms, synthetic aperture radar, tracking and scanning radars, HF (OTH) radar, radar environmental and remote sensing, radar astronomy. Prerequisite: senior undergraduate or graduate standing.

3 units, alternate years, given 2001-02

261. The Fourier Transform and its Applications—The Fourier transform as a tool for solving physical problems. Fourier transform of discrete and continuous time signals, generalized transforms, and Fourier series. Convolutions and correlations, the Dirac delta function, Fourier transform theorems, measures of time duration and bandwidth, analysis of linear systems, sampling theorems, the discrete Fourier transform, and two-dimensional Fourier analysis. Prerequisite: previous exposure to Fourier series at the level of 102.

3 units, Spr (Inan) alternate years, not given 2001-02

262. Two-Dimensional Imaging—Time and frequency representations, two-dimensional auto- and cross-correlation, Fourier spectra, diffraction and antennas, coordinate systems and the Hankel and Abel transforms, line integrals, impulses and sampling, restoration in the presence of noise, reconstruction and tomography, imaging radar. Students create software to form images using these techniques using actual data. Prerequisites: 261. Recommended: 278, 279.

3 units, Aut (Zebker)

263. Introduction to Linear Dynamical Systems—Introduction to applied algebra and linear dynamical systems, with application to circuits, signal processing, communications, and control systems. Topics: least-squares approximations of over-determined equations and least-norm solutions of underdetermined equations. Symmetric matrices, matrix norm, and singular value decomposition. Eigenvalues, left and right eigenvectors, with dynamical interpretation. Matrix exponential, stability, and asymptotic behavior. Multi-output systems, impulse and step matrices; convolution and transfer matrix descriptions. Control, reachability, and state transfer. Least-norm inputs and associated Gramians. Observability and least-squares state estimation. Prerequisites: exposure to basic linear algebra and matrices (as in Mathematics 103); differential equations and Laplace transforms (as in 102).

3 units, Aut (Boyd)


3 units, Aut (Widrow)

265. Signal Processing Laboratory—Designed for undergraduate and graduate students, applying 101, 102, 103 to real-world signal processing applications. Lab exercises use a programmable DSP to implement signal processing tasks. Topics: A/D conversion and quantization, filter design and implementation, spectral analysis, voice codes, audio signal processing, image and video compression.

3 units, Win, Spr (Meng)

268. Introduction to Modern Optics—Geometrical optics: raytraces, Gaussian beams, optical instruments, and radiometry. Wave nature of light: Maxwell's equations, propagation through media with varying index of refraction (e.g., fibers). Interferometry: basic principles, practical systems, and applications.

3 units, alternate years, given 2001-02

271. Introduction to VLSI Systems—Large-scale MOS design. Topics: MOS transistors, static and dynamic MOS gates, MOS circuit fabrication, design rules, resistance and capacitance extraction, power and delay estimation, scaling, MOS combinational and sequential logic design, registers and clocking schemes, memory, data-path, and control-unit design. Elements of computer-aided circuit analysis, synthesis, and layout techniques. Prerequisites: 112; familiarity with circuits, logic design, and digital system organization.

3 units, Aut (Horowitz)

Spr (DeMicheli)

272. Design Projects in VLSI Systems—For students with research and applications interest in VLSI systems. Teams of two complete modest-sized CMOS chip of their own design, including writing a functional model (in Verilog), using synthesis tools, custom layout, and simulation. Overview of the issues involved in VLSI design. Topics: design tools and techniques, complexity management, clocking issues, layout and floor-planning, design of large array structures, testing and testability issues. Lab. Prerequisites: 271, experience with digital design.

4 units, Win (Horowitz)

273. Digital Systems Engineering—Fundamental electrical issues in the design of high-performance digital systems, including signaling, timing, synchronization, noise, and power distribution. High-speed signaling methods; noise in digital systems, its affect on signaling, and methods for noise reduction; timing conventions; timing noise (skew and jitter), its affect on systems, and methods for mitigating timing noise; synchronization issues and synchronizer design; clock and power distribution problems and techniques; impact of electrical issues on system architecture and design.

3 units, Win (Daily)

274. Introduction to Cryptography and Computer Security—(Enroll in Computer Science 255.)

275. Logic Design—(Formerly 381.) Principles and techniques of logic design. Combinational circuit analysis (hazard detection); combinational circuit design including PLA, VLSI, and MSI techniques and testing techniques; IC logic families, flip-flop properties, sequential circuit analysis and synthesis for fundamental and pulse mode circuits, design for testability techniques. Prerequisite: 121 or equivalent.

3 units, Aut, Win (McCloskey)


3 units, Spr (Cox)

277. Stochastic Decision Models—(Enroll in Management Science and Engineering 251.)

278. Introduction to Statistical Signal Processing—Random variables, vectors, and processes; time averages, expectations, and laws of large numbers; stationarity, autocorrelation, and spectral analysis; mean square error estimation, detection, and linear filtering; independent increment, Gaussian, and Poisson random processes. Prerequisite: 177 or 178, and linear systems and Fourier transforms at the level of 102 or 261.

3 units, Aut (El Gamal)

Win (Prabhakar)

279. Introduction to Communication Systems—Analysis and design of communication systems; analog and digital modulation and demodulation, frequency conversion, multiplexing, noise and distortion; spectral and signal-to-noise ratio analysis, error ratios in digital systems. Prerequisites: 102 or 261, 278.

3 units, Win (Cox)
281. Embedded System Design Laboratory—Lectures on the architecture and design of microprocessor-based systems. Lab experiments use Microchip PIC16C74 microcontroller evaluation board. Five-week individual design project. Lab. Prerequisites: 121, and 181 or 182 or equivalent experience in assembly language programming.

3 units, Aut (Gill)

282. Computer Architecture and Organization—The structure of systems using processors, memories, input/output (I/O) devices, and I/O interfaces as building blocks. Computer system instruction set design and implementation, including memory hierarchies and pipelining. Issues and tradeoffs involved in the design of computer system architectures with respect to the design of instruction sets. Prerequisite: 182.

3 units, Aut, Win (Rosenblum)

283. Compilers—(Enroll in Computer Science 143.)

284. Introduction to Computer Networks—Structure and components of computer networks; functions and services; packet switching; layered architectures; ISO’s Open Systems Interconnections (OSI) reference model; physical layer; data link layer; error control; window flow control; media access control protocols used in local area networks (Ethernet, Token Ring, FDDI) and satellite networks; network layer (datagram service, virtual circuit service, routing, congestion control, IP); transport layer (UDP, TCP); application layer.

3-4 units, Aut (Tobagi)

Win (enroll in Computer Science 244A)

285. Programming Languages—(Enroll in Computer Science 242.)

286A. Operating Systems and Systems Programming—(Enroll in Computer Science 140.)

286B. Advanced Topics in Operating Systems—(Enroll in Computer Science 240.)

287. Introduction to Computer Graphics—(Enroll in Computer Science 24B.)


289. Introduction to Computer Vision—(Enroll in Computer Science 223B.)

290A,B,C. Curricular Practical Training for Electrical Engineers—For EE majors who need relevant work experience as part of their program of study. Final report required. Prerequisite for 290B: candidate for Engineer or Ph.D. in Electrical Engineering. Prerequisite for 290C: candidate for Ph.D. degree in Electrical Engineering.

1 unit, Aut, Win, Spr (Gray)

292. Special Seminars—Special seminars and experimental courses are given on topics of current interest by specialists in the field. Announcements are made one or two quarters prior to presentation. See Time Schedule and bulletins in the department office for current listing. By arrangement


3 units, Aut (da Rosa)


3 units, Win (da Rosa)

GRADUATE

300. Master’s Thesis and Thesis Research—For students who wish to do independent work under the direction of a department faculty member as part of their master’s degree program. Written thesis is required for final letter grade. The continuing grade ‘N’ is given in quarters prior to the thesis submission. (See 390 if a letter grade is not appropriate.)

by arrangement

310. Integrated Circuits Technology and Design Seminar—In-depth treatment of device structures, fabrication technologies, and circuit design issues in integrated circuits. Introduces current research topics in these areas. (AU)

1 unit, Aut (Lee, Wooley)

311. Advanced Integrated Circuit Fabrication—What are the practical and fundamental limits to the evolution of the technology of modern MOS and bipolar devices? How are modern devices and circuits fabricated and what future changes are likely? Advanced techniques and models of device and back-end (interconnect and contact) processing. Use of SUPREM and PISCES for process modeling. MOS and bipolar process integration. Prerequisites: 212, 216.

3 units, Spr (Saraswat)

312. Solid-State Sensors and Actuators—Surveys solid-state sensors and actuators, focusing on the use of integrated circuit fabrication technology for their realization. Categories of sensors and actuators are biological, chemical, mechanical, optical, thermal, etc. Basic mechanisms of transduction, fabrication techniques, and the relative merits of different technologies. Micromachining techniques for monolithic integration of active circuits with sensors or actuators and directions for future research. Prerequisite: 212.

3 units, Win (Kovacs)


3 units, Win (Horowitz)

314. RF Circuit Design—Design of RF integrated circuits for communications systems. Topics: the design of low-noise amplifiers at RF, passive and active filters, mixers, modulators, and demodulators; review of classical control concepts necessary for oscillator design including PLLs and PLL-based frequency synthesizers. Design of high-efficiency (e.g., class E, F) RF power amplifiers, coupling networks. Behavior and modeling of passive and active components at RF. Prerequisite: 214.

3 units, Win (Lee)

315. VLSI Data Conversion Circuits—Design of mixed-signal integrated circuits for implementing the interfaces between analog and digital signals in CMOS VLSI systems. Fundamental circuit elements such as sample-and-hold circuits, comparators, voltage references, operational amplifiers, gain blocks, and analog integrators. The design of the constituent circuits for Nyquist-rate and oversampling analog-to-digital and digital-to-analog converters, sampled-data and continuous-time analog filters, and digital decimation and interpolation filters. Prerequisite: 214.

3 units, Spr (Wooley)

316. Advanced VLSI Devices—In modern VLSI technologies, MOS and bipolar device electrical characteristics are sensitive to structural details and therefore to fabrication techniques. How are VLSI devices
317. Micropatterning for Integrated Circuits—The fundamentals of generating submicron patterns in integrated circuit manufacturing. Technologies include the formation of submicron images of ultraviolet light, the resulting exposure of polymeric resists, the subsequent development of resist patterns and their transfer into functional circuit material patterns through plasma etching and other techniques. The use of phase-shifting masks and other wavefront-engineering approaches. Extensive hands-on use of computer simulations of each of the above steps. Prerequisites: 141 or equivalent, 212 or equivalent, basic competence in computing.

3 units, alternate years, given 2001-02

318. Logic Synthesis of VLSI Circuits—Solving logic design problems with CAD tools for VLSI circuits. Analysis and design of exact and heuristic algorithms for logic synthesis. Topics: representation and optimization of combinational logic functions (encoding problems, binary decision diagrams), representation and optimization of multiple-level networks (algebraic and Boolean methods, “don’t care” set computation, timing verification, and optimization), modeling and optimization of sequential functions and networks (retiming), semicustom libraries and library binding. Prerequisites: familiarity with logic design, algorithm development, and programming.

3 units, Win (DeMicheli)

319. Computer-Aided System Design Laboratory—Computer-aided design of VLSI systems: theory and practice. Topics: modeling languages (e.g., Verilog), high-level synthesis and optimization methods (scheduling, binding, data-path, and control synthesis), design of systems with low-power consumption, and hardware/software co-design. Individual/group projects involve the use of CAD tools. Prerequisite: 318.

3 units, Spr (DeMicheli)

320. Automatic Formal Verification Techniques—(Enroll in Computer Science 356.)

325. Principles of Magnetic Recording—(Enroll in Materials Science and Engineering 348.)

326. Organic Materials for Electronic and Photonic Devices—(Enroll in Materials Science and Engineering 343.)

327. Properties of Semiconductor Materials—Modern semiconductor devices and integrated circuits are based on the unique energy band, carrier transport, and optical properties of semiconductor materials. These physical properties can be chosen and optimized for operation of semiconductor devices. Emphasis is on the quantum mechanical foundations of the properties of solids, energy bandgap engineering, semiclassical transport theory, semiconductor statistics, carrier scattering, electro-magneto transport effects, high field ballistic transport, Boltzmann transport equation, quantum mechanical transitions, optical absorption, and radiative and non-radiative recombination. Prerequisites: 216, 228.

3 units, Win (J. Harris)

328. Physics of Advanced Semiconductor Devices—The principles governing the operation of modern semiconductor devices. Underlying assumptions and approximations commonly made in analyzing devices. Emphasis is on the application of semiconductor physics to the development of advanced semiconductor devices (e.g., heterojunctions, HJ-FETs, nano structures, tunneling, single electron transistor and photonic devices). Use of ATLAS and MEDICI 2-D Poisson solvers for simulation of ultra-small devices. Examples are related to up-to-date device research.

3 units, alternate years, given 2001-02

329. The Electronic Structure of Surfaces and Interfaces—Basic physical concepts and phenomena for surface science techniques probing the electronic structure of surfaces and interfaces. Microscopic and atomic models in understanding microstructures have technologically important applications, e.g., within semiconductor device technology and catalysis. The basic physical processes of low energy electron diffraction, Auger electron spectroscopy, UV and x-ray photoemission spectroscopy, electron/photon stimulated ion desorption, inelastic tunneling spectroscopy, ion scattering, surface EXAFS, and energy loss spectroscopy; and experimental aspects of these surface science techniques. Prerequisites: Physics 70 or equivalent; 238 or consent of instructor.

3 units, Aut (Pianetta) alternate years, not given 2001-02

335. Introduction to Information Storage Systems—Introduction to state-of-the-art data storage technologies at materials, device, and system levels. Magnetic disk recording, optical recording, and magneto-optic recording. System considerations of noise, signal-to-noise ratio, error rates, error-correction coding, and detection channels. Introduction to selected emerging information storage technologies. Recommended: college level general physics, electromagnetism.

3 units, Win (Wang)

338A. Quantum Optics and Measurements—(Enroll in Applied Physics 387.)

338B. Mesoscopic Physics and Nanostructures—(Enroll in Applied Physics 388.)
3 units, given 2001-02

349. Advanced Modern Optics—Holography (basic principles, Bragg holography); photorefractive effect (physical principles and applications); wave matter interactions (polarization effects); vigorous coupled wave analysis. Prerequisite: 268 or 366, or equivalent. 
3 units, Spr (Hesselink) alternate years, not given 2001-02

350. Radioscience Seminar—Seminars by university and industrial researchers on topics from space physics, planetary exploration, ionospheric and magnetospheric physics, radar and remote sensing of the environment, applied electromagnetics, waves in optical fibers, and information systems with space applications. Student-faculty discussions. (AU) 
1 unit, Aut (Tyler) 
Win (Inan) 
Spr (Fraser-Smith)

351. Digital Switching in Telecommunications—Switching fundamentals; space and time division switching; blocking probability analysis; rearrangeable networks; self-routing networks; ATM switching architectures; performance evaluation of ATM switches; network synchronization and signaling methods. Prerequisite: 374 or basic knowledge of telecom systems. 
3 units, Spr (Narasimha)

352. Electromagnetic Waves in the Ionosphere and Magnetosphere—Magnet-ionic theory in multi-component media, signal dispersion, group ray velocity, wave polarization, refractive index surfaces, ray tracing, absorption, boundary effects, interpretation of natural phenomena (whistlers, VLF emissions), remote sensing in plasmas, communication theory of wave-particle interactions in the magnetosphere. Prerequisite: 142 or equivalent. 
3 units, Spr (Helliswll) alternate years, not given 2001-02

354. Introduction to Radio Wave Scattering—Integral and differential equations of radio wave scattering; exact, approximate, and numerical solutions of single particle scattering for spheres, edges, points, and cylinders. Scattering from rough surfaces with large and small roughness scales, as time permits. Multiple scattering; formulation and solution techniques for equation of transfer in discrete media and scattering by continuous media in weak and strong regimes. Applications to radar, radar astronomy, remote sensing, and biological media. Prerequisites: 241 or equivalent, and partial differential equations, or consent of instructor. 
3 units, Win (Tyler) alternate years, not given 2001-02

355. Imaging Radar and Applications—Radar remote sensing, radar image characteristics, viewing geometry, range coding, synthetic aperture processing, correlation, range migration, range/Doppler algorithms, wave domain algorithms, polar algorithms, polarimetric processing, interferometric measurements. Applications: polarimetry and target discrimination, topographic mapping surface displacements, velocities of ice fields. Prerequisites: 254, 261. Recommended: 264, 278, 279. 
3 units, alternate years, given 2001-02

3 units, alternate years, given 2001-02

357. Microstructures Fabrication Laboratory—Enrollment preference to students pursuing doctoral research programs requiring the use of the Ginzton microfabrication facility. Projects on the application of microfabrication technologies to exploratory devices. Planar fabrication techniques including contact lithography, vacuum deposition, and chemical etching. Use of analytical instruments including the scanning electron microscope, surface profilometer, and wafer probe station. Prerequisites: 212 or 333, consent of instructor. 
3 units, Sum (Khuri-Yakub)

358A. Lasers Laboratory—(Enroll in Applied Physics 304.)

358B. Nonlinear Optics Laboratory—(Enroll in Applied Physics 305.)

359. Wireless Communication—Performance of digital modulation in fading and intersymbol interference; flat fading countermeasures—diversity, coding and interleaving, adaptive modulation; intersymbol interference countermeasures; equalization, multicarrier modulation, spread spectrum and RAKE receivers; multiple access—FDMA, TDMA, CDMA; cellular mobility issues, capacity and area spectral efficiency. Prerequisite: 276. 
3 units, Aut (Goldsmith)

360. Advanced Topics in Wireless Communications—Current research areas in wireless communications: new theoretical developments, system design issues, and implementation constraints. Possible topics: adaptive modulation and coding, OFDM, spread spectrum, multicarrier spread spectrum, smart antennas, multuser detection, cellular system design, dynamic resource allocation, handoff and mobility management, access and channel assignment, system capacity, packet radio networks. Focus is on multiple access, cellular system design, packet radio networks. Prerequisites: 276 and 359. 
3 units, Spr (Goldsmith) alternate years, not given 2001-02

361A. Modern Control Design I—(Enroll in Engineering 207A.)

361B. Modern Control Design II—(Enroll in Engineering 207B.)

362. Applied Vision and Image Systems—(Enroll in Psychology 221.)

363. Linear Dynamic Systems—Continuation of 263. Optimal control and dynamic programming; linear quadratic regulator. More on Lyapunov theory and methods. Time-varying and periodic systems. Realization theory. Linear estimation and the Kalman filter. Examples and applications from digital filters, circuits, signal processing, and control systems. Prerequisites: 263 or equivalent, basic probability as in Statistics 116 or 278. 
3 units, given 2001-02

364. Convex Optimization with Engineering Applications—Recognizing and solving convex optimization problems that arise in engineering. Convex sets, functions, and optimization problems. The basics of convex analysis and theory of convex programming: optimality conditions, duality theory, theorems of alternative, and applications. Least-squares, linear and quadratic programs, semidefinite programming, geometric programming, extremal volume, etc. Numerical algorithms for smooth unconstrained problems; interior-point and ellipsoid methods for constrained problems. Applications to signal processing, communi-
369A. Medical Imaging Systems I—Imaging internal structures within the body using high-energy radiation studied from a systems viewpoint. Modalities covered: x-ray, computed tomography, and nuclear medicine. Analysis of existing and proposed systems in terms of resolution, modulation transfer function, detection sensitivity, noise, and potential for improved diagnosis. Prerequisite: 261.
3 units, alternate years, given 2001-02

369B. Medical Imaging Systems II—Imaging internal structures within the body using non-ionizing radiation studied from a systems viewpoint. Modalities include ultrasound and magnetic resonance. Analysis of ultrasonic systems including diffraction and noise. Analysis of magnetic resonance systems including including physics, Fourier properties of image formation, and noise. Prerequisite: 261.
3 units, Spr (Nishimura)

370. Information Systems Seminar—Lectures/discussion of topics and research areas in information systems. Topics: communication and information theory, signal processing, systems and control, and optical information processing. (AU)
1 unit, Aut, Win, Spr (Staff)

371. Advanced VLSI Circuit Design—Overview of important issues in high performance digital VLSI design. Focus is from a system perspective (a fast processor, DSP, etc.), CMOS, circuits. Topics: wire modeling, logic families, latch design and clocking issues, clock distribution, RAMs, ALUs, I/O and I/O noise issues. Final project involves the design of a subsystem for a high-speed processor. Extensive use of SPICE. Prerequisites: 271, 313, or consent of instructor. Recommended: knowledge of C and C-shells.
3 units, Spr (Horowitz)

372. Quantization and Data Compression—The theory and design of codes for quantization and signal compression systems (source coding systems), which convert analog or high bit rate digital signals to low bit rate signals while optimizing fidelity, subject to available communication and storage capacity. The theoretical and practical tradeoffs among bit rate, fidelity, and complexity in codes for quantization and compression. Topics: scalar quantization (PCM), transform and predictive codes, lossless (entropy) codes, vector quantizers designed using clustering and decision tree design algorithms, Bayes optimal prediction and classification, Shannon distortion-rate theory, and high rate (asymptotic) quantization theory. Prerequisites: 261, 278.
3 units, Spr (Gray) alternate years, not given 2001-02

3 units, Win (Widrow)

3 units, Spr (Widrow)

3 units, Win (Narasimha)

375. Advanced Analysis of Feedback—For advanced students. The required mathematics and basic results in the analysis of linear and nonlinear feedback systems. Nonlinear ODEs, local and global stability, Lyapunov theory. Gains of operators, small gain theorems, loop transformations, circle criteria, Popov theorem. Passive and contractive operators, Kalman-Yacubovich theorem. Robustness of multivariable linear systems, stability of feedback systems, linear systems with nonlinear actuators and sensors, overflow and quantizer induced limit cycles in digital filters. Prerequisite: 263.
3 units, Spr (Boyd) alternate years, not given 2001-02
376A. Information Theory—Information theory and statistics. The extreme points of communication theory: data compression to the entropy limit, and communication at the channel capacity limit. Kolmogorov complexity, Shannon entropy. Rate distortion theory. Huffman coding and random coding. Unified treatment based on the asymptotic equipartition theorem. Prerequisite: 278 or Statistics 116, or equivalent. 3 units, Win (Cover)

376B. Information Theory—Rate distortion theory and Kolmogorov complexity. Information theory and statistics. Stein’s Lemma. AEP. Information capacity of networks. Slepian-Wolf Theorem. Optimal investment and information theory. Maximum entropy and Burg’s Theorem. Prerequisite: 376A. 3 units, Spr (Cover) alternate years, not given 2001-02

377A. Dynamic Programming and Stochastic Control—(Enroll in Management Science and Engineering 351.)

377B. Neuro-Dynamic Programming and Reinforcement Learning—(Enroll Management Science and Engineering 339.)


379A. Digital Communication I—Maximum-likelihood data detection, modulation methods and bandwidth requirements, bandpass systems and analysis, intersymbol interference and equalization methods, diversity, phase-locking, and synchronization. Prerequisites: 103, 278. 3 units, Win (Cioffi)

379B. Digital Communication II—Capacity calculation, cut-off rates, Viterbi Detection, partial-response methods, convolutional codes, trellis and turbo codes, shaping codes, encoder/decoder complexity. Prerequisites: 278, 379A. 3 units, Spr (Cioffi) alternate years, not given 2001-02

379C. Advanced Digital Communication—Topics: transmit optimization for channels with intersymbol interference, combined equalization and coding, line coding design and analysis, discrete multitone (DMT), vector modulation, generalized DFE. 3 units, alternate years, given 2001-02

380. Seminar on Computer Systems—Current research in the design, implementation, analysis, and use of computer systems ranging from integrated circuits to operating systems and programming languages. (AU) 1 unit, Aut, Win, Spr (Allison, Wharton)

381A. Database System Implementation—(Enroll in Computer Science 346.)

381B. Transaction Processing and Distributed Databases—(Enroll in Computer Science 347.)

382. Processor Design—Cycle time, area tradeoffs, AT measures of arithmetic units, multiple issue processors, vector and multimedia extensions, shared memory multiprocessors, I/O systems. Design using queueing analysis. Prerequisite: 282 or equivalent. 3 units, given 2001-02

383. Advanced Compiling Techniques—(Enroll in Computer Science 243.)

384A. Internet Protocols and Standards—Local area networks protocols: MAC Addressing; IEEE 802.1 bridging protocols (trans-
388. Programming Language Design—(Enroll in Computer Science 342.)

390. Special Studies or Projects in Electrical Engineering—Independent work under the direction of a faculty member. Individual or team activities may involve lab experimentation, design of devices or systems, or directed reading.

391. Special Studies and Reports in Electrical Engineering—Independent work under the direction of a faculty member; written report or written examination required. Letter grade given on the basis of the report; if not appropriate, student should enroll in 390.

392. Special Seminars—Special seminars and experimental courses are given on topics of current interest by specialists in the field. Announcements are made one or two quarters prior to presentation. See Time Schedule and bulletins in department office for current listing.

392A Database System Principles—(Enroll in Computer Science 245.)

392B. Introduction to Image Sensors and Digital Cameras—Introduction to the design and analysis of image sensors and digital cameras. Analysis of the signal path in a digital camera starting from the optics, through the sensor, the A/D converter, to the different color processing steps. Topics: photodetectors; CCD and CMOS passive and active sensor operation; noise and FPN analysis; spatial resolution and MTF; SNR and dynamic range; A/D conversion approaches; color interpolation, correction, and balance; and autofocus. A MATLAB camera simulator is used to explore various tradeoffs in camera design. Prerequisites: undergraduate level device, circuit, and system background, e.g., equivalent to 102, 111, 112, and 113; and some familiarity with noise analysis.

3 units, Spr (El Gamal)

392J. Digital Video Processing—The fundamentals of digital video processing. Spatio-temporal sampling, motion analysis, motion-compensated filtering, and general video processing operations including noise reduction, restoration, superresolution, frame-rate conversion, deinterlacing, and compression (frame-based and object-based methods). Advanced topics: video segmentation, digital television, and video libraries and databases (MPEG-7). Prerequisite: 368A or 368B.

3 units, Win (Apostolopoulos, Wee)

392K. Genetic Algorithms and Genetic Programming—(Enroll in Computer Science 426.)

392L. Optical Fiber Communications Laboratory—Experimental techniques in optical fiber communications. Students investigate, experimentally, properties of key optical communications components: fibers, lasers, modulators, photodiodes, optical amplifiers, WDM multiplexers and demultiplexers, etc. Key optical communications systems techniques: eye diagrams and BER measurements. Prerequisites: 247, 348.

3 units, Spr (Kazovsky)

392M. Adaptive Communication Systems—Advanced communication design techniques for wireless and high-speed wireline applications. General and applied concepts in communication theory, concepts in digital communication receivers (adaptive antenna array and adaptive equalization). The practical aspects of advanced algorithms and systems for wireless digital communications of second and third generation: IS-136 and WCMDA. Discussion about ADSL and OFDM system. Skills and level of problem solving enables students to contribute effectively to research and development in this area. Prerequisites: one graduate course in signal processing, communication systems and probability. Recommended: exposure to simulation platforms, e.g., MATLAB and Simulink.

3 units, Win (Bahai)

392P. Constrained Coding—Introduction to the theory and practice of constrained coding. Descriptions of several applications where constrained coding has been used: magnetic tape drives, optical disk drives, holographic recording, and a wireless communications application. Develop formal properties of constrained systems, capacity and code rate, finite-state encoders, sliding-block decoders, culminating in the state-splitting code construction algorithm. Alternative models of encoding and code construction. Methods of integrating constrained codes with error-correction codes: concatenation with Reed-Solomon codes, reversed concatenation, turbo decoding, forbidden list codes and spectral null codes. Prerequisites: elementary probability, linear algebra. Recommended: error-correction coding, information theory.

3 units, Aut (Marcus)

392Q. Mobile and Wireless Networks and Applications—(Enroll in Computer Science 444N.)

395. Electrical Engineering Instruction: Practice Teaching—Open limited to number of advanced graduate students in Electrical Engineering who plan to make teaching their career. Qualified students conduct a small section of an established course taught in parallel by an experienced instructor.

1-15 units, Aut, Win, Spr (Gray)

399. Topics in Computer Vision—(Enroll in Computer Science 328.)

400. Thesis and Thesis Research—Limited to students who have established candidacy for the degree of Engineer or Ph.D. A grade of 'S' indicates satisfactory work; no letter grade is assigned.

by arrangement

402A. Seminar: Topics in International Technology Management—Internet access modes and electronic commerce in E. Asia. Implications of new wireless, optic fiber, TV cable, and other network infrastructures for Internet-based e-commerce in major E. Asian markets. Distinguished guests from industry and government. (AU)

1 unit, Aut (Dasher)

402S. Seminar: Topics in International Advanced Technology Research—Wafer-level packaging: international trends and challenges. Approaches and issues in vertical stacking, flip-chip CSP, surface mount assemblies, thin and thick film lamination, wafer thinning, thin-die functionality, interconnects, etc. Distinguished speakers from industry and government. (AU)

1 unit, Spr (Dasher)

410. Integrated Circuit Fabrication Laboratory—Preference to students pursuing doctoral research programs in which the facilities of the IC lab are used. Laboratory fabrication of silicon gate NMOS or CMOS integrated circuits. Emphasis is on the practical aspects of IC fabrication, including silicon wafer cleaning, photolithography, etching, oxidation, diffusion, ion implantation, chemical vapor deposition, physical sputtering and wafer testing. Prerequisites: 212, 216, consent of instructor.

3-4 units, Win (Saraswat)

414. Design of RF Integrated Circuits for Communications Systems—Students design, build, and test GHz transceivers using microstrip construction techniques and discrete components. The design, construction, and experimental characterization of representative transceiver building blocks: low noise amplifiers (LNAs), diode ring mixers, PLL-based frequency synthesizers, voltage-controlled oscillators (VCOs), power amplifiers (PAs), and microstrip patch antennas. The characteris-
453. Geomagnetically Trapped Radiation—Charged particle trapping in planetary magnetic fields, and its importance in near-earth-space phenomena. The motion of charged particles in inhomogeneous magnetic and electric fields, adiabatic invariants, distribution functions and diffusion equation methods. Useful theorems for interpreting experimental data. Source and loss processes and the physical mechanisms responsible for producing trapped radiation at the earth and other planets. Prerequisite: 142.

3 units, alternate years, given 2001-02

478. Blind Multichannel Identification and Equalization—Theory and algorithms for blind system identification and channel equalization. Applications to array signal processing, wireless communication, and medical and seismic signal processing.

3 units, alternate years, given 2001-02

479. Multiuser Digital Transmission Systems—Fundamental theoretical multiuser communications concepts (multiple access, broadcast, multiuser detection, crosstalk), matrix channel descriptions and optimized multiuser transmission, code-division multiple access concepts and implementations.

3 units, given 2001-02


3 units, alternate years, given 2001-02


3 units, Spr (Dally) alternate years, not given 2001-02

483. Topics in Compilers—(Enroll in Computer Science 343.)

484. Topics in Computer Graphics—(Enroll in Computer Science 448.)


486. Advanced Computer Arithmetic—Number systems, floating point representation, state of the art in arithmetic algorithms, problems in the design of high speed arithmetic units. Prerequisite: 282.

3 units, Win (Flynn) alternate years, not given 2001-02

487. Digital Signal Processing Architectures and Systems—The design and implementation of signal processing systems. Survey of the variety of architectures and the tools available to automate this task. Case studies in data communications, low power design, and video signal processing. Topics: DSP building blocks, hardware generation using silicon compilers, dedicated architectures, programmable architectures, architecture design tools, video compression, wireless communication, and low-power implementation. Prerequisites: 271, basic DSP concepts, C programming language, and UNIX.

3 units, Spr (Meng)


3 units, alternate years, given 2001-02


3 units, alternate years, given 2001-02

492. Special Seminars—Special seminars and experimental courses are given on topics of current interest by specialists in the field. Announcements are made one or two quarters prior to presentation. See the Time Schedule and bulletins in department office.

do by arrangement

MANAGEMENT SCIENCE AND ENGINEERING


Chair: M. Elisabeth Paté-Cornell

Deputy Chair: Peter W. Glynn


Associate Professors: Nicholas Bambos, Samuel S. Chiu, Ross D. Shachter, Edison T. S. Tse

Assistant Professors: Diane E. Bailey, Meiring de Villiers, Pamela J. Hinds, Benjamin Van Roy

Professors (Research): Walter Murray, Michael A. Saunders, John P. Weyant

Professor (Teaching): Robert E. McGinn

Associate Professor (Teaching): Thomas H. Byers

Consulting Professors: Hung-Po Chao, Naushad Forbes, Thomas Kosnik, James E. Matheson, Robert R. Maxfield, Peter A. Morris, D. Warner North, Richard D. Smallwood

Consulting Associate Professors: Adam Borison, Charles D. Feinstein, Samuel Holtzman, Gerd Infanger, Neil F. Kane, Laura Kopczak, Mike Lyons, Doug Mackenzie, Audrey MacLean, Behnarn Tabrizi, Adel Turki

Lecturers: Hill Huntington, Ferdo Ivanek, Robert A. Luenberger, Burke Robinson, Sam Savage

Visiting Professors: Olivier De La Grandville, Sy Goodman, Debra Meyerson

Visiting Associate Professor: Yee-Tien Pu

Director of the Industrial Affiliates Program: Sam L. Savage

Affiliated Faculty: David Beach, J. Michael Harrison, Charles A. Holloway, Kosuke Ishii, James G. March, David B. Montgomery, Evan L. Porteus, Krishna Saraswat
In December 1999, the Board of Trustees authorized the creation of the Department of Management Science and Engineering from the Department of Industrial Engineering and Engineering Management and the Department of Engineering-Economic Systems and Operations Research. The department's mission is: "to conduct research and provide education associated with the development of the knowledge, tools, and methods required to make decisions and shape policies, configure organizational structures, design engineering systems, and solve operational problems associated with the information-intensive, technology-based economy."

Management Science and Engineering (MS&E) provides exceptionally strong programs of education and research by integrating three basic strengths: (1) substantial depth in conceptual and analytical foundations, (2) comprehensive coverage of functional areas of application, and (3) vigorous interaction with other Stanford departments, with Silicon Valley industry, and with many organizations throughout the world. The analytical and conceptual foundations include optimization, dynamic systems, stochastic systems, economics, organizational science, and decision and risk analysis. These foundations support the functional areas and provide the basis for further advance in the discipline. The functional areas of application include finance, production, information, organizational behavior, marketing, entrepreneurship, policy, and strategy. Programs in these functional areas emphasize both fundamental concepts and practical applications. Close associations with other engineering departments and with industry enrich the programs by providing opportunities to apply MS&E methods to important problems and by motivating new theoretical developments from practical experience. MS&E's programs also provide a basis for contributing to other important areas such as biotechnology, defense policy, environmental policy, information systems, telecommunications, and other areas where mastery of fundamentals, functional knowledge, and an engineering viewpoint are extremely valuable.

CAREERS IN MS&E

MS&E helps students prepare for a variety of professional careers in business, government, industry, non-profit institutions, and universities. Graduates have pursued successful careers in consulting, enterprise management, financial analysis, government policy analysis, industrial research, line management, product development, project management, strategic planning, and university teaching and research. Some have founded companies specializing in financial services, high technology products, management and systems consulting, or software. Other graduates have helped establish new analytical capabilities in existing firms or government agencies.

Many graduates have become leaders in technology-based businesses, which have an increasing need for well-educated, analytically oriented people who understand both business and technology. The Department of MS&E is attractive to people with engineering, mathematical science, and physical science backgrounds as it complements their technical abilities with the conceptual frameworks needed to analyze problems of investment, management, marketing, operations, production, and strategic planning in a technical environment.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

The program leading to the B.S. degree in Management Science and Engineering (MS&E) is stated under the "School of Engineering" section of this bulletin, and more information is contained in the School of Engineering's Handbook for Undergraduate Engineering Programs. Students are encouraged to plan their academic programs as early as possible, ideally in the freshman or sophomore year. Do not wait until you have declared a major to consult with the department's Student Services staff.

This curriculum provides students training in the fundamentals of engineering systems analysis to prepare them to plan, design, and implement complex economic and technological management systems. Graduates are prepared for work in a variety of career paths, including facilities and process management, investment banking, management consulting, or graduate study in industrial engineering, operations research, economics, public policy, medicine, law, or business.

The program builds on the foundation courses for engineering, including calculus, science, and engineering fundamentals, with courses in computer science, finance, mathematical modeling, organization theory, probability, statistics, and either information science or a senior group project. To develop depth in a particular area, students choose a concentration in either financial and decision engineering, industrial engineering/operations management, operations research, technology and organizations, or technology and policy.

Although the department offers a major in Industrial Engineering accredited by the Accreditation Board for Engineering and Technology (ABET), students are also free to choose majors with different concentrations or science courses.

The program builds on a strong engineering foundation. The required mathematics courses include calculus of single and multiple variables, linear algebra, probability, statistics, and stochastic models. (It is recommended that students take Statistics 110, although Statistics 190 is an option.) At least 14 units of science are required. For the ABET-certified degree program in Industrial Engineering, these must be physics and chemistry.

The program includes five Engineering Fundamental courses, technically rigorous introductory courses in various engineering disciplines. Engineering 60 introduces students to finance and decision analysis, Computer Science 106A is the first of two required computer science courses, and Engineering 40 provides some background and laboratory experience in electrical engineering. Although students can choose any two other engineering fundamentals, it is strongly recommended that they take Engineering 25, which presents the basic science and engineering principles of biotechnology.

The Technology in Society requirement is satisfied by a subset of the courses approved by the School of Engineering, particularly those that emphasize social responsibility. Some of these courses are also included in some of the concentrations, but in those cases the same course can only count toward one requirement.

The Writing in the Major (WIM) requirement can be met by four restricted electives in the program. It is up to the students to ensure that their programs include at least one of them, either in their concentrations or their Technology in Society courses.

The department core comprises courses in computer science, deterministic optimization, finance, organization theory, and either a senior project or a new course being developed in information science. Through the core, mathematics, engineering fundamental, and Technology in Society courses, all students in the program are exposed to the breadth of faculty interests, and are in a good position to choose a concentration during the junior year.

The following five concentrations are designed to allow a student to explore one area of the department in greater depth. Some of the courses require some prerequisites (Economics 1 or Psychology 1) not included in the degree program, but those courses could be used to satisfy the General Education Requirements (GERs).

1. Operations Management: focuses on the design and analysis of manufacturing, production and service systems. If all of the ABET requirements are met, then a student with this concentration who takes the project course can receive a degree in Industrial Engineering from the Department of Management Science and Engineering. These requirements include a particular set of science courses and minimum totals for units of "Engineering Science" and "Engineering Design" among the courses in the degree program.

2. Operations Research: provides a more mathematical program, based on algorithms, theory, and applications in economics and operations.

3. Technology and Policy: designed for students seeking a broad technological background coupled with policy analysis. It features courses in microeconomics, public policy, ethics or the law, and applications in national security and commercial technology policy.

4. Financial and Decision Engineering: focuses on the design and analysis of financial and strategic plans. It features accounting, decision
GRADUATE PROGRAMS

The faculty have developed graduate degrees in Management Science and Engineering (MS&E). The graduate degrees in EES&OR and IEEM will be phased out, and no new students will be admitted to those programs.

MS&E, in collaboration with other departments of the University, offers programs leading to the degrees of Master of Science and Doctor of Philosophy. The department also offers a coterminous B.S./M.S. degree, a master's degree in Manufacturing Systems Engineering in cooperation with the Department of Mechanical Engineering and a dual M.S./EE master's degree in cooperation with the Department of Electrical Engineering.

Applications for admission as graduate students in MS&E must submit the results of the verbal, quantitative, and analytical parts of the Graduate Record Examination. The deadline for application is February 1.

Except in unusual circumstances, admission is limited to the Autumn Quarter because courses are arranged sequentially with basic courses and prerequisites offered early in the academic year.

Assistantships and Fellowships—A limited number of fellowships and assistantships are awarded each year. Applicants admitted to the doctoral program, who have indicated on their application that they would like to be considered for financial aid, are automatically considered for these assistantships and fellowships.

Information about loan programs and need-based aid for U.S. citizens and Permanent Residents can be obtained from the Graduate Financial Support section of the Financial Aid Office.

MASTER OF SCIENCE

The M.S. degree programs require a minimum of 45 units beyond the equivalent of a B.S. degree at Stanford. All programs represent substantial progress in the major field beyond the bachelor's degree.

University requirements for the master's degree are described in the "Graduate Degrees" section of this bulletin.

MANAGEMENT SCIENCE AND ENGINEERING

The M.S. program in Management Science and Engineering (MS&E) prepares individuals for a life-long career addressing critical technical and managerial needs in private and public decision making. Department requirements for the M.S. degree provide breadth across some of the areas of the department, and flexibility for meeting individual objectives of depth in a particular area of concentration. The master's degree may be a terminal degree program with a professional focus, or a preparation for a more advanced graduate program. The M.S. degree can normally be earned in one academic year (three academic quarters) of full-time work, although students may choose to continue their education by taking additional MS&E courses beyond that year. Background requirements, taken in addition to degree requirements, must be met by students who have had insufficient course work in mathematical sciences, computer science, engineering and/or natural sciences.

Students must take a minimum of 45 course units as follows:
1. At least five core courses.
2. At least three other courses in an area of concentration of their choice.
3. A course in probability, unless a college-level course in probability has already been passed.
4. A project course requirement.
5. The remaining units in elective courses.

Background Requirements—Students must have had or must take the following (or equivalent) courses before the M.S. degree is conferred: Mathematics 41, 42, 51 (Calculus, 15 units), Computer Science 106A (programming, 5 units), and an additional 15 units of engineering, mathematical sciences, or natural sciences. These courses do not count toward the 45 units of the M.S. degree. These additional background requirements would typically be met by students who have a bachelor's degree in engineering, or mathematical or natural sciences. Students are notified at the time of admission of any remaining need to meet background requirements.

Core Courses—M.S. students must take at least five courses out of the following ten options:

- Dynamic Systems (MS&E 201) or Stochastic Decision Models (MS&E 251)
- Linear and Non-Linear Optimization (MS&E 211)
- Introduction to Stochastic Modeling (MS&E 221) or Simulation (MS&E 223)
- Economic Analysis (MS&E 241)
- Decision Analysis (MS&E 252), or Risk Analysis (MS&E 251A)
- Industrial Accounting (MS&E 140), Investment Science (MS&E 242), Financial Decisions (MS&E 245E), or Introduction to Finance (MS&E 245G)
- Production Systems (MS&E 261)
-Organizational Behavior and Management (MS&E 280)
- Marketing for Technology-Based companies (MS&E 279), or Global Entrepreneurial Marketing (MS&E 271)
- Strategy in Technology-Based Companies (MS&E 270)

Students may not waive core courses. They may, however, substitute an approved, more advanced course in the same area.

Courses in an Area of Concentration—Students must complete a departmentally approved set of three or more courses of 3 units or more in an area of concentration of one of the following types:
1. An area of concentration in the MS&E department.
2. An area of concentration in one of the seven other departments of the School of Engineering.
3. In exceptional cases, a coherent area of concentration designed by the student.

Project Course Requirement—Students must take either a designated project course or two designated integrated project courses.

Additional requirements are:
1. At least 27 units must be in courses numbered 200 and above in the MS&E, and at least 36 units must be in courses numbered 100 or above in MS&E or closely related fields. These courses and all core, concentration, and project course requirements must be taken for a letter grade.
2. The degree program must be completed with a grade point average (GPA) of 3.0 or higher.
3. Courses in athletics do not apply towards the degree.
4. All transfers of graduate-level units (a maximum of 9 units) and all course substitutions must have prior written approval in a Course Waiver/Transfer form.
5. A maximum of 18 Non-Degree Option (NDO) units can be applied toward the degree.

ENGINEERING: MANUFACTURING SYSTEMS ENGINEERING

The M.S. in Engineering with a concentration in Manufacturing Systems Engineering addresses the need for engineers who combine management and design skills focused on manufacturing. There is a critical need for individuals who can deal directly with product design for manufacturability; design of integrated manufacturing systems; financial, organizational, and strategic management issues; and elements of automation technology such as computer-aided design, computer-aided manufacturing, robotics, and microprocessor control.
Manufacturing Systems Engineering is a joint effort of the departments of Mechanical Engineering, and Management Science and Engineering. The program seeks highly qualified students with strong educational backgrounds in engineering and provides a demanding curriculum that is strong in both hardware and engineering management. Successful applicants should have a minimum of one year of full-time industrial experience.

The hardware and engineering-design aspects of the program include:

- Ambidextrous Thinking
- Design for Manufacturability
- Integrated Design for Marketability and Manufacturing
- Manufacturing and Design
- Microprocessor Applications
- Robotics and Manipulation
- Smart Product Design

The engineering management subjects include:

- Engineering Economy
- Industrial Accounting
- Inventory Control and Production Systems
- Management of New Product Development
- Manufacturing Strategy
- Manufacturing Systems Design
- Marketing for Technology-Based Companies
- Organizational Behavior and Management
- Supply
- Supply Chain Management

The hardware and engineering design courses provide hands-on training of these functions and the trade-offs that must be made in selecting alternative systems configurations.

The engineering management subjects provide a suitable perspective so that alternative system choices can be appropriately evaluated for their financial, organizational, and production impacts, as well as their impact on the firm’s manufacturing policy.

Beyond the required core, the curriculum allows for elective courses chosen from a broad set of relevant electives providing additional training in engineering management, engineering-design hardware, and aspects of computer science. A student may follow individual interests and tailor the program to meet individual needs.

Students interested in a career focused on manufacturing management and product development may apply for the Dual Manufacturing Systems Engineering and the M.B.A. program. Minimum requirements can be met through six to seven quarters of study if the candidate matriculates in both Engineering and the M.B.A. program. Minimum requirements can be met so that alternative system choices can be appropriately evaluated for their financial, organizational, and production impacts, as well as their impact on the firm’s manufacturing policy.

Beyond the required core, the curriculum allows for elective courses chosen from a broad set of relevant electives providing additional training in engineering management, engineering-design hardware, and aspects of computer science. A student may follow individual interests and tailor the program to meet individual needs.

Students interested in a career focused on manufacturing management and product development may apply for the Dual Manufacturing Systems Engineering and the M.B.A. program. Minimum requirements can be met through six to seven quarters of study if the candidate matriculates in both programs simultaneously.

The detailed requirements for the M.S. in Manufacturing Systems Engineering are available from the MS&E Student Services office.

MANAGEMENT SCIENCE AND ENGINEERING (MS&E) AND ELECTRICAL ENGINEERING (EE)

Admission—For the dual degree, admission to both departments is required, but is coordinated by designated members of both Admissions Committees who make recommendations to the committees of their respective departments.

Advising—Every student in the dual degree program has one adviser in EE, and one in MS&E. In addition, a committee consisting of designated faculty from both departments serves as a review committee on performance and as an overseeing body of ongoing and graduating students of the program. The committee, consisting of designated members of both Admission Committees as described in the previous section, may initially serve as this overseeing body.

The Dual Degree Program—This dual-degree program enables a small, selective set of graduate students to obtain both the MS&E master’s degree and the EE master’s degree simultaneously. Students complete the course requirements for each department. However, the total number of units required to complete the dual-degree is 72 (versus 90 if the two degrees were pursued separately), and the total number of full-time quarter residency equivalents required to complete the dual degree is six (students with a 50 percent teaching or research assistantship, who average 9 units per quarter, earn .62 of a full quarter of residence).

PROFESSIONAL EDUCATION

The Stanford Center for Professional Development (SCPD) provides opportunities for employees of some local and remote companies to take courses at Stanford.

The Honors Cooperative Program (HCP) provides opportunities for employees of some local companies to earn a M.S. degree over a longer period, by taking one or two courses per academic quarter. Some required courses are only offered on campus; HCP students must plan to attend those courses at Stanford to meet the degree requirements. It is not currently possible to complete this program as a remote HCP student. Students must apply for a degree program through the standard application process, and must meet the standard application deadline of February 1.

The Non-Degree Option (NDO) allows employees of some local companies to take courses for credit from their company sites before being admitted to a degree program. Students apply to take NDO courses each quarter through the Stanford Center for Professional Development.

For additional information about the NDO application process and deadlines, see http://scpd.stanford.edu, or contact the SCPD at (650) 725-3000.

The department offers a Certificate Program within the framework of the NDO program. A certificate in one of several specialties can be obtained by completing three core courses, plus one MS&E elective course for the total of four courses. For further information, see: http://scpd.stanford.edu/ce/ndp/certificate.html.

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. degree are described in the “Graduate Degrees” section of this bulletin.

The Ph.D. degree in MS&E is intended for students primarily interested in a career of research and teaching, or high-level technical work in universities, industry or government. The program requires three years of full-time graduate study, at least two years of which must be at Stanford University. Typically, however, students take about four to five years after entering the program to complete all Ph.D. requirements. The Ph.D. is generally organized around the requirement that the students acquire a certain breadth across some of the eight areas of the department, and depth in one of them. These areas are:

- Decision analysis and risk analysis
- Economics and finance
- Information science and technology
- Organization, technology, and entrepreneurship
- Policy and strategy
- Probability and stochastic systems
- Production operations and management
- Systems modeling and optimization

Doctoral students are required to take a number of courses, both to pass a qualifying exam in one of these areas and to complete a dissertation based on research which must make an original contribution to knowledge.

Each student admitted to the Ph.D. program must satisfy a breadth requirement and pass a qualification procedure. The purpose of the qualification procedure is to assess the student’s command of the field and to evaluate his or her potential to complete a high-quality dissertation in a timely manner. The student must complete specified course work in one of the eight areas of the department. The qualification decision is based on the student’s grade point average (GPA), on the one or two preliminary papers prepared by the student, and on the student’s performance in an area examination. Considering this evidence, the department faculty votes on advancing the student to candidacy in the department at large. The Ph.D. requires a minimum of 72 units, at least 54 of which must be in courses of 3 units or more. At least 48 course units in courses of 3 units or more must be taken for a letter grade. Finally, the student must pass a University oral examination and complete a Ph.D. dissertation. During the course of the Ph.D. program, students who do not have a master’s degree are strongly encouraged to complete one, either in MS&E or in another Stanford department.
Breadth Requirement—

1. The breadth requirement is to be satisfied by a choice of four courses spanning four out of the above mentioned eight areas of the department. The list of courses satisfying the breadth requirement is available from the MS&E Student Services office.
2. The Ph.D. candidacy form must contain four courses that satisfy the breadth requirement.
3. Courses chosen to satisfy the breadth requirement must be taken for letter grades.
4. At least one of the four courses chosen to satisfy the breadth requirement must be at the 300 level.

Qualification Procedure Requirements—The qualification procedure is based on breadth across the department’s disciplines and depth in an area of the student’s choice. The qualification process must be completed by the end of the month of May of the student’s second year of graduate study in the department. The performance of all doctoral students is reviewed every year at a department faculty meeting at the end of May or beginning of June. Ph.D. qualification decisions are made at that time and individual feedback is provided.

The Ph.D. qualification requirements comprise three elements:

1. Grade Point Average: a student must maintain a GPA of at least 3.4 in the four courses chosen to satisfy the breadth requirements, and a GPA of at least 3.4 in the set of all courses taken by the student within the department. In both cases, the GPA is computed on the basis of the nominal number of units for which each course is offered.
2. Paper(s): a student may choose between two options, either to be completed before the Spring Quarter of the student’s second year. The first option involves one paper supervised by a primary faculty adviser in one area and a faculty consultant in another area. The objective is to permit a student who has decided on a principal thesis focus to concentrate early in that area while benefiting from the input (and broadening) afforded by the participation of a faculty member outside the primary area of research. This paper should be written in two quarters.
   - The second option involves two shorter sequential tutorials in two different areas, with two different faculty advisers. Each tutorial should be completed in one quarter. In both options, the student chooses the faculty adviser(s)/consultant with the faculty members’ consent.
   - A student may register for up to three per tutorial and up to 6 units for a paper. These paper or tutorial units do not count towards the 54 course units required for the Ph.D., and letter grades are not given.
3. Area Qualification: in addition, during the second year, a student must pass an examination in an area of his or her choice, either in one of the eight department areas already defined by the faculty, or in a ninth area representing a mix of area specialties to be defined by a cognizant faculty group (including at least three faculty members) appointed by the department chair. This area examination is written, oral, or both at the discretion of the area faculty administering the exam.
4. Area Course Requirement: students must complete the depth requirements of one of the eight areas of the MS&E department. The Ph.D. requirements for the eight areas of the MS&E department are available from the MS&E Student Services office.

COURSES

(AY) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).
(WIM) indicates that the course meets the Writing in the Major requirements.

UNDERGRADUATE

60. Engineering Economy—(Enroll in Engineering 60.)
   3 units, Aut (Jacker)
   Win, Sum (Staff)

101. Undergraduate Directed Study—(Formerly IE 191.) Directed study on a subject of mutual interest to the student and faculty member.
   Student must find a faculty sponsor and submit a one-page description of plan.
   1 or more units (Staff)

107. Interactive Management Science—(Formerly EES&OR 137; graduate students register for 207.) Examines analytical techniques such as linear and integer programming, Monte Carlo simulation, forecasting, decision analysis, and Markov chains in the environment of the spreadsheet. Materials include spreadsheet add-ins for implementing these and other techniques. Emphasis is on building intuition through interactive modeling, and extending the applicability of this type of analysis through integration with existing business data structures. Project required of those enrolled in 207.
   3 units, Aut, Sum (Savage)

108. Senior Project—(Formerly IE 180.) Restricted to IE majors in their senior year. Students participate in a major project in groups of four. Problem identification and definition, emphasizing data collection, synthesizing feasible solutions to real problems, and presentation of results. Prerequisites: 121, 140, 164, 169, 180, 245, 260; Computer Science 106B or X; Engineering 40, 62.
   5 units, Win (Staff)

111. Introduction to Optimization—(Formerly EES&OR 111; enroll in Engineering 62.)
   4 units, Aut (Cottle)
   Spr (Veinott)

120. Probabilistic Analysis—(Formerly EES&OR 120.) Probabilistic concepts important to rigorous problem solving, focusing on model building and communication: the structuring, processing, and presentation of probabilistic information. Probabilistic information using axiomatic principles. Life examples provide motivation and illustrations of modeling techniques for probabilistic situations. Standard spreadsheet use provides probabilistic insights (and solution capability) to complement analytical closed form solutions. Topics: introductory probability (tools and concepts, e.g., the axioms of probability theory, random variables, distributions, the concept of conditioning, expectation and limit theorems, etc.). Materials from legal, social, medical, physical, and daily encountered problems. Prerequisites: 120 or Statistics 116.
   4 units, Spr (Glynn)

121. Introduction to Stochastic Modeling—(Formerly EES&OR 121.) Stochastic processes and models in operations research. Discrete and continuous time parameter Markov chains. Queuing theory, inventory theory, simulation. Prerequisite: 120 or Statistics 116.
   4 units, Spr (Veinott)

122. The Flaw of Averages—(Formerly EES&OR 21.) A common cause of bad planning is the flaw of averages. This error occurs whenever an uncertain quantity is represented by a single average number. Examples of the flaw of averages may be obvious or insidious. The information age is changing our perspective of uncertainty. Seminar is designed to recognize the flaw of averages, avoid it in everyday thinking, introduce recent information technologies for preventing the flaw of averages, and relate this new approach of dealing with uncertainty to traditional statistics.
   2 units, Aut (Savage)

130. Information Systems—(Formerly IE 175.) Introduction to the design and use of computer-based information systems. Topics: software and hardware used in information systems, information requirements, database design, information system design, organizational aspects of information systems, and applications of information systems in different industries. Prerequisites: 180; Computer Science 106A, 106B.
   4 units, Win (Staff)

170
131. Information Science—Information science is presented in terms of five essential aspects of information (five E's): Information as entropy is the classical information theory concerning bits and bytes, channel capacity, bandwidth, coding, and encryption. Information as an economic commodity, unlike other commodities information generally, is not lost when it is consumed, and this has important consequences for how information is efficiently produced, priced, and distributed. Information as enlightening, where information can influence decisions made, and for this purpose has a value that can be calculated. Information as embodied in physical form, where vast quantities of information are stored in data bases and data warehouses, and transmitted through networks that package, encrypt, switch, and route it from location to location. Information as extracted from data, using data-mining and modeling techniques. Modern instances of these five information concepts. 

3 units, Win (Luenberger)

140. Industrial Accounting—(Formerly IE 133.) Non-majors and minors who have taken or are taking elementary accounting should not enroll. Introduction to accounting concepts and the operating characteristics of accounting systems. The principles of financial and cost accounting, design of accounting systems, techniques of analysis, and cost control. Designed for the use of accounting information and not as an introduction to a professional accounting career. Interpretation and use of accounting information for decision making is stressed. 

3-4 units, Aut, Sun (Staff)

141. Financial Literacy—(Formerly EES&OR 41.) Practical knowledge about personal finance and money management including budgeting, credit cards, banking, insurance, taxes, and saving. Real-life credit card bills, bank statements, paycheck stubs, and insurance policies. 

1 unit, Win, Spr (Morrison)

152. Introduction to Decision Analysis—(Formerly EES&OR 152.) How to make good decisions in a complex, dynamic, and uncertain world. People often make decisions that on close examination they regard as wrong. Decision analysis uses a structured conversation based on actional thought to obtain clarity of action in a wide variety of domains. Topics: distinctions, possibilities and probabilities, relevance, value of information and experimentation, relevance and decision diagrams, risk attitude. (WIM) 

4 units, Spr (Shachter)

160. Analysis of Production and Operating Systems—(Formerly IE 260.) Graduate students register for 260; see 260. 

4 units, Aut (Staff)

164. Manufacturing Systems Design—(Formerly IE 125; graduate students see 264.) The concepts and techniques of designing and improving productive systems. Emphasis is on the physical and organizational design of high-performance manufacturing systems. Multidisciplinary approach with the use of digital simulation as a tool for evaluating design alternatives. Prerequisites: 121, 169, 180. (WIM) 

5 units, Spr (Bailey)

169. Quality Assurance and Control—(Formerly IE 121.) Introduction to the concepts and statistical methods that companies use to manage and improve quality. Topics: sampling inspection, statistical process control, quality function deployment, cost of quality, and Taguchi's method for designing in quality. Prerequisites: 120 or Statistics 116, and Statistics 110 or 190. 

4 units, Win (Staff)

180. Organizations: Theory and Management—(Formerly IE 100.) For undergraduates only, with preference to IEEM and MS&E majors. Survey of classical and modern organization theory, covering the behavior of the individual, the work group, and the organization. 

4 units, Aut (Staff) Spr (Hinds)

181. Issues in Technology and Work for a Post-Industrial Economy—(Formerly IE 101.) Introduces undergraduates in industrial engineering and other engineering disciplines to the study of technology and work, exploring topics of contemporary concern and identifying challenges posed by a post-industrial workplace. Objectives: explore how changes in technology and organization are altering the way we work and live our lives; become acquainted with approaches to studying and designing work; and examine how a grounded understanding of work and work practices can assist engineers in designing better technologies and organizations. Representative topics: job design, distributed and virtual organizations, the blurring of boundaries between work and family life, computer supported cooperative work, trends in skill requirements and occupational structures, monitoring and surveillance in the workplace, downsizing and its effects on work systems, project work and project based lifestyles, the growth of contingent employment, telecommuting, electronic commerce, and the changing nature of labor relations. 

3 units (Barley) given 2001-02

182. Work, Technology, and Society—(Formerly IE 170; fulfills the School of Engineering's Technology in Society requirement.) Seminar on work in contemporary society as influenced by rapid technological change. Causes and consequences of the current revolution in work, and policies for grappling with resultant problems. Focus is on the U.S., with attention to key trends in selected foreign countries. Topics: new technology in the workplace and its bearing on occupational and organizational changes, employer-employee relations, worker health and safety, economic competitiveness, women workers, workplace ethics, and the future of work. Limited enrollment. 

4 units (McGinn) given 2001-02

192Q, Stanford Introductory Seminar: International Environmental Policy—Preference to sophomores. Introduction to the science, using economics and the politics of international environmental policy. Current negotiations on global climate change are a case study. Lectures/materials are self-contained and similar to material the instructor used in briefing international negotiations and the U.S. Congress, integrating the material more comprehensively in policy briefings on individuals, dimensions, or the problem and its potential solutions. 

4 units, Aut (Weyant)

193. Technology in National Security—(Formerly EES&OR 193; graduate students register for 293.) Examines critical decisions made by the U.S. in selected security and space programs, emphasizing current issues. Case studies illustrate the process by which technical, political, and economic issues are brought into the policy process; particularly, the way in which technical organizations in government, government committees, and science advisory boards interact to bring advice to senior policy makers. Some case decisions in other countries. (WIM) 

3 units, Aut (Perry)

194. The Role of Analysis in Environmental Policy Decisions—(Formerly EES&OR 194; graduate students register for 294.) Examines major past and current public policy decisions on issues such as air pollution, toxic chemicals, nuclear waste, and global climate alteration. Case studies from the instructors' personal experience illustrate the process by which technical, political, and economic factors are brought into the policy process. Emphasis is on the role of analysis in summarizing technical information and uncertainties and on the reconciliation of differing points of view among government experts, scientific advisory boards, and interested/affected parties among the public. Recommended: background in quantitative analysis (i.e., basic undergraduate courses in engineering, science, or economics). 

3-5 units, Spr (North)

195. International Security in a Changing World—(Formerly EES&OR 195; same as Political Science 138.) Surveys the major international and regional security problems in the modern world. Interdisciplinary faculty lecture on the political and technical issues
involved in arms control, the military legacy of the Cold War, regional security conflicts, proliferation of advanced weapons capabilities, ethnic conflicts, and peacekeeping efforts. GER:3B (DR:9)
5 units, Win (Blacker, Perry, May, Sagan)

196. Transportation Systems and Urban Development—(Formerly EES&OR 196.) Introduction to transportation systems and planning, and their roles in society. Analytical tools introduced at a conceptual level examine issues and evaluate alternatives. Policy implications and system effectiveness analysis of transportation in an urban context. Topics: economic analysis of transportation, supply and demand equilibrium analysis, urban transportation networks, congestion management, short and long term transportation planning, the impact of technology on transportation systems, land use and transportation, case studies and analysis of current transportation news items. Prerequisite: Mathematics 21.
3 units (Staff) not given 2000-01

197. Ethics and Public Policy—Ethical issues in science- and technology-related public policy conflicts. Develops the capacity for rigorous critical analysis of complex, value-laden policy disputes. Topics: the nature of ethics and morality; the natures of and rationales for liberty, justice, and human rights; and the use and abuse of these concepts in recent and current policy disputes. Cases from: biomedicine, environmental affairs, the technical professions, communications, and international relations. GER:3a (DR:8) (WIM)
5 units, Win (McGinn)

PRIMARILY FOR GRADUATE STUDENTS

GENERAL AND SYSTEMS ANALYSIS METHODS

201. Dynamic Systems—(Formerly EES&OR 231.) Introductory; the goal is to train students to think dynamically in decision making, and recognize and analyze dynamic phenomena in diverse situations. Concepts: formulation and analysis; state-space formulation; solutions of linear dynamic systems, equilibria, dynamic diagrams; eigenvalues and eigenvectors of linear systems, the concept of feedback; nonlinear dynamics, phase plane analysis, linearized analysis, Liapunov functions, catastrophe theory. Examples: grabber-holder dynamics, technology innovation dynamics, creation of new game dynamics in business competition, ecosystem dynamics, social dynamics and stochastic exchange dynamics. Prerequisite: Mathematics 103 or equivalent.
4 units, Win (Tse)

207. Interactive Management Science—(Formerly EES&OR 237; undergraduates register for 107.) Examines analytical techniques, e.g., linear and integer programming, Monte Carlo simulation, forecasting, decision analysis, and Markov chains in the environment of the spreadsheet. Spreadsheet add-ins for implementing these and other techniques. Emphasis is on building intuition through interactive modeling, and extending the applicability of this type of analysis through integration with existing business data structures. Project.
3 units, Aut, Sum (Savage)

208. Practical Training—(Formerly EES&OR 208.) Students obtain employment in a relevant industrial or research activity, chosen to enhance their professional experience, and consistent with the degree program they are pursuing. Prerequisite: consent of instructor.
1 unit, Aut, Win, Spr, Sum (Savage)

OPTIMIZATION

4 units, Aut (Staff)

3 units, Aut (Eaves)

PROBABILITY AND STOCHASTIC SYSTEMS

220. Probabilistic Analysis—(Formerly EES&OR 221.) Concepts and tools for the analysis of problems under uncertainty, focusing on model building and communication: the structuring, processing, and presentation of probabilistic information. Examples from legal, social, medical, and physical problems provide motivation and illustrations of modeling techniques. Spreadsheets illustrate and solve problems as a complement to analytical closed-form solutions. Topics: axioms of probability, random variables, distributions, conditioning, expectation inference, and limit theorems. Prerequisite: Mathematics 51.
4 units, Aut (Shachter)

221. Stochastic Modeling—(Formerly EES&OR 222.) Continuation of 220. Topics: limit theorems, discrete and continuous time Markov chains, renewal processes, queuing theory, and transform analysis. Emphasis is on building a framework to formulate and analyze probabilistic systems. Prerequisite: 220 or Statistics 217.
3 units, Win (Glynn)

223. Simulation—(Formerly EES&OR 232.) Generation of uniform and non-uniform random numbers, discrete-event simulations, simulation languages, design of simulations, statistical analysis of the output of simulations, variance reduction, optimization via simulation, applications to modeling stochastic systems in computer science, engineering, finance, and operations research. Prerequisites: a working knowledge of FORTRAN, PASCAL, C, or C++; probability at the level of 120 or Statistics 116.
3 units, Spr (Staff)

224. Stochastic Models in Operations Research—(Formerly EES&OR 273.) Formulation and analysis of models in operations research involving stochastic processes. Topics: Markovian queues, queues with embedded Markov chains, general single server queue, queuing networks, diffusion approximations, queues in heavy traffic. Prerequisites: 221, 251, or equivalent.
3 units (Staff) not given 2000-01

INFORMATION SCIENCE AND TECHNOLOGY

230. Introduction to Computer Networks—(Enroll in Electrical Engineering 284.)
3 units, Aut (Tobagi)

232. Information Technology and Supply Chain Management—(Formerly IE 267; same as Business T372.) Advancements in information technologies have enabled major innovations in the re-engineering of industry supply chains, redefining the ways companies operate their supply chains. New ventures have emerged to create values for business partners and the consumers in supply chain integration. How information technologies have advanced supply chain integration and coordination. The dimensions of business and process improvements. New opportunities using supply chain management concepts and emerging technologies. Enrollment limited.
4 units, Spr (Lee, Whang)
234. Organizations and Information Systems—(Formerly IE 275.)
For graduate students interested in how information systems impact organizations and how organizations take control of information technology (IT) to gain a competitive edge. Topics: IT strategy, the fit between IT and corporate culture, IT architectural alternatives, changing technologies and organizational learning, the effect of IT on competition, and outsourcing as an offensive strategy. Student teams perform field studies based on situations in which information technology is creating a significant management problem or business opportunity. Case based. Enrollment limited. Prerequisites: 180 or 280, consent of instructor.
4 units, Spr (Tabrizi)

236. Pricing Next Generation Telecommunications Products and Services—(Formerly EES&OR 286.) Telecommunication products and services pricing as the key to success in a rapidly changing and highly competitive market. Interdisciplinary approach to position, price, and distribution of traditional/innovative telecommunication services. Topics: the telecommunication industry as driven by technological advancements, policy choices, and explosive business opportunities; the pricing revolution and arbitrage opportunities in international voice created by data-voice convergence and liberalization; competitive aspects of service delivery channels; commoditizing of bandwidth and basic services; clearinghouses; financial risk hedging through futures/derivatives trading; the need to develop intelligent pricing and provisioning agents for product bundling; grade of service differentiation; positioning and revenue optimization by capturing consumer preferences. Group project in industrial participation.
3 units, Sum (Chiu)

237. Progress in Worldwide Telecommunications—(Formerly EES&OR 297.) Interdisciplinary study of topics in current worldwide developments and economic trends with the participation of prominent guest speakers from telecommunications organizations and industry. Topics: telecommunications services and networks, (de)regulation and market-driven competition, technology, standardization, international organizations, and the needs of the underserved parts of the world. Individual or team case study and a verbal presentation. May be repeated for credit.
3 units, Sum (Ivanek, Chiu)

ECONOMICS, FINANCE, AND INVESTMENT

241. Economic Analysis—(Formerly EES&OR 241.) Principal methods of the economic analysis of the production activities of firms (production technologies, cost and profit; perfect and imperfect competition); individual choice (preferences and demand); and the market-based system (price formation, efficiency, welfare.) Emphasis is on the analytical foundations and the practical applications of the methods presented. See 341 for continuation of 241. Recommended: 211.
4 units, Win (DeVilliers)

242. Investment Science—(Formerly EES&OR 242.) Introduction to modern quantitative investment analysis: theory and practical application. How modern investment concepts can be used to evaluate and manage opportunities; structure portfolios; and use sophisticated investment products including stocks, bonds, mortgages, and annuities. Topics: deterministic cash flows (time-value of money, present value, internal rate of return, term structure of interest rates, bond portfolio immunization, project optimization); mean-variance theory (Markowitz model, capital asset pricing); dynamic and uncertain cash flows. Emphasis is on translating theory into actual procedures. Examples of applications for every major topic. Group project devoted to application of the theory. See 342 for continuation of 242.
3 units, Aut (Chiu)
Sum (Feinstein)

245G. Introduction to Finance—(Formerly IE 236; same as Business F221.) The foundations of finance, with applications in corporate finance and investment management. The process of valuation, which is central to many of the major financial decisions made by corporate managers and investors. Topics: criteria for making investment decisions, relationships between risk and return, market efficiency, and the valuation of derivative securities (e.g., options). The major financial instruments issued by corporations including short and long term debt, equity, and convertible securities. Conceptually rigorous; cases illustrate applications of the main concepts. Prerequisites: 120 or Statistics 116; 140 and Engineering 60. Recommended: Engineering 62; Statistics 110 or 190.
4 units, Win (Admiral)

247E. International Investment and Financing—(Formerly IE 237.) Builds on the concepts in 235, e.g., NPV, capital structure, and cost of capital estimation, and extends these concepts to an international setting where foreign exchange plays a key role. Topics: exchange rate determination theories, the performance of exchange forecasting models, exchange rate exposure and hedging, international borrowing and capital structure, and international project evaluation. Practical standpoint; however, an understanding of the theory is a necessity in "real world" applications. Prerequisite: 245.
3-4 units, Spr (Staff)

247S. International Investments—(Formerly EES&OR 243.) Introduces international financial markets, their comparative behavior, and their interrelations. Focus is on the assets traded in liquid markets: currencies, equities, bonds, swaps, and derivatives. Topics: institutional arrangements, taxation and regulation, international arbitrage and parity conditions, valuation of target firms for cross-border acquisitions, international diversification and portfolio management, derivative instruments and dynamic investment strategies, international performance analysis, international capital flows and financial crises, and topics of current relevance and importance. Corequisite: basic finance theory (equivalent of 242 or 245).
3 units, Sum (Fu)

248. Economics of Natural Resources—(Formerly EES&OR 246.) Intertemporal economic analysis of natural resource use, particularly energy, and including air, water, and other depletable mineral and biological resources. Emphasis is on an integrating theory for depletable and renewable resources. Stock-flow relationships; optimal choices over time; short- and long-run equilibrium conditions; depletion/extinction conditions; market failure mechanisms (common-property, public goods, discount rate distortions, rule-of-capture); policy options. Prerequisite: 241 or Economics 51.
4 units (Sweeney) not given 2000-01

249. Growth and Development—(Formerly EES&OR 249.) How to assess new investment opportunities in the countries of the Pacific Rim and other fast growing economies. Useful for investors and those guiding their country's development choices. Topics: the mechanism of economic growth, the equation of interest, optimal growth, economic interpretation of the calculus of variations and optimal control theory results, uncertainty, tools for evaluating long-term growth rate, geometric moments, and exponential distribution. Investment incentives, country risk indices. The long view: rule of law vs. rule of people. Practical cases from Ireland, E. European countries, China, and other E. Asian countries.
3 units, Sum (de La Grandville)

DECISION AND RISK ANALYSIS

250A. Engineering Risk Analysis—(Formerly IE 240.) The techniques of analysis of engineering systems for risk management decisions involv-
ing trade-offs (technical, humans, environmental aspects). Four parts: elements of decision analysis; probabilistic risk analysis (fault trees, event trees, etc.); economic analysis of failure consequences (issues of human safety and long-term economic discounting); and case studies (e.g., space, systems, nuclear power plants, liquefied natural gas terminals, and dams). Emphasis is on risk management issues in the public and private sectors. Prerequisites: 120 or Statistics 116, and Engineering 60, or equivalents.

3 units, Win (Paté-Cornell)

250B. Project Course in Engineering Risk Analysis—(Formerly IE 241.) Students, individually or in groups, choose, define, formulate, and resolve a real risk management problem, preferably from a local firm or institution. Oral presentation and report required. Scope of the project is adapted to the number of students involved. Three phases: risk assessment, communication, and management. Emphasis is on the use of probability for the treatment of uncertainties and sensitivity to problem boundaries. Enrollment limited, consent of instructor. Prerequisite: 250A.

3 units, Spr (Paté-Cornell)

251. Stochastic Decision Models—(Formerly EES&OR 251.) Efficient formulation and computational solution of sequential decision problems under uncertainty. Markov decision chains and stochastic programming. Maximum expected present value and rate of return. Optimality of simple policies: myopic, linear, index, acceptance limit, and (s,S). Optimal stationary and periodic infinite-horizon policies. Applications to investment, options, overbooking, inventory, production, purchasing, selling, quality, repair, sequencing, queues, capacity, transportation. MATLAB is used. Prerequisites: probability, linear programming.

3 units, Win (Veinott)

252. Decision Analysis I—(Formerly EES&OR 252.) Coherent approach to decision making, using the metaphor of developing a structured conversation having desirable properties, and producing actional thought that leads to clarity of action. Instruction is Socratic, with computational issues covered in problem sessions. Emphasis is on creation of distinctions, representation of uncertainty by probability, development of alternatives, specification of preference, and the role of these elements in creating a normative approach to decisions. Evaluates information-gathering opportunities in terms of a value measure. Relevance and decision diagrams represent and clarify inference and decision. Principles are applied to decisions in business, technology, law, and medicine. See 352 for continuation.

4 units, Aut (Howard)

254. The Ethical Analyst—(Formerly EES&OR 254.) The professional analyst who uses technical knowledge in support of any individual, organization, or government is ethically responsible for the consequences. Students are sensitized to ethical issues, providing the means to form ethical judgments, questioning the desirability of physical coercion and deception as a means to reach any end. Exploration of human action and relation in society is conducted in the light of previous thought, and is used to provoke additional research on the desired form of social interactions. Attitudes toward ethical dilemmas are explored by creating an explicit personal code. Issues from the range of human affairs test the student’s framework for ethical judgment.

1-4 units, Spr (Howard)

PRODUCTION OPERATIONS, SERVICES, AND MANUFACTURING

260. Analysis of Production and Operating Systems—(Formerly IE 260, undergraduate students register for 160.) Introduction to the design, operation, and control of production systems using mathematical, computational, and modern analytical techniques. Topics: determination of optimal facility location, determination of production lot sizes, optimal timing and sizing of production capacity expansion, and introduction to inventory control. Prerequisites: 120 or Statistics 116, and Engineering 62.

4 units, Aut (Staff)

261. Inventory Control and Production Systems—(Formerly IE 261.) Topics in the planning and control of manufacturing systems. The functions of inventory, determination of order quantities and safety stocks, alternative inventory replenishment systems, item forecasting, production-inventory systems, materials requirements planning (MRP), just-in-time systems, master and operations scheduling, supply chain management, and service operations. Enrollment limited. Prerequisite: 120 or Statistics 116 or equivalent.

3 units, Win (Hausman)

262. Supply Chain Management—(Formerly IE 262.) Definition of a supply chain, coordination difficulties, pitfalls and opportunities in supply chain management, inventory-service tradeoffs, performance measurement and incentives. Supply chain network design, global supply chain management, the manufacturing/distribution interface, supplier management. Design and redesign of products and processes for supply chain management, tools for design, industrial applications, strategic alliances, current industry initiatives. Enrollment limited to 50 MS&E students. Prerequisite: 260 or 261.

3 units, Spr (Hausman)

263. Service Operations Management—(Formerly IE 263.) Operations management in the service industries (e.g., banking, transportation, travel and tourism, health, government) and within service functions of manufacturing (e.g., financing, customer service). Topics: design and delivery of services, the measurement of productivity and quality, managing capacity and demand, quality management, reengineering of service delivery processes, management of technology in services, and managing human resources. Prerequisite: 120 or Statistics 116. Recommended: Engineering 62.

3 units, Spr (Brandeau)

264. Manufacturing Systems Design—(Formerly IE 225; undergraduates see 125.) The concepts and techniques useful in the initial design and redesign of modern, high-performance manufacturing systems. Multidisciplinary approach considers the design of the physical and organizational aspects of manufacturing systems. Emphasis is on the use of simulation as a tool for design evaluation. Prerequisite: graduate standing in engineering.

4 units, Aut (Jucker)

265. Reengineering the Manufacturing Function—(Formerly IE 265.) Preference given to undergraduates. Student teams of four to six redesign the manufacturing and distribution system of a medium-sized manufacturer, focusing on the transportation system, inventory policies for a regional warehouse, design of a national distribution system, operational improvements of work flow, layout of the manufacturing plant, and redesign of the planning and control system. Redesign is at an operational level consistent with a strategy of integrating the functions of manufacturing and distribution. Modular approach, with each module requiring analytical or game software. Data is provided. Groups meet twice per module with faculty; written report required. Topics: production planning, inventory theory, linear/integer programming, economic analysis, and applied probability. Modules are integrated via the focus on the customer; group learning is emphasized. Enrollment limited. Prerequisite: senior or graduate standing, 160; Engineering 60 and 62.

4 units (Carlson) alternate years, given 2001-02

266. Management of New Product Development—(Formerly IE 266.) Techniques of managing or leading the process of new product development that have been found effective. Emphasis is placed on how much control is desirable and how that control can be exercised in a setting where creativity has traditionally played a larger role than discipline. Topics: design for manufacturability, assessing the market, imposing discipline on the new product development process, creating an effective development organization, and developing products to hit cost targets.

4 units, Win (Carlson)
Decisions in entrepreneurial settings, including selecting financial partners. Evans is on understanding why changes occur in addition to what they entail. Topics: changes in the mode of production, performance objectives, sources of inspiration, factory set-up, work organization, arenas of competition, and information technology. Implications for future design.

4 units, Spr (Bailey)

267. Innovations in Manufacturing—(Formerly IE 226.) Major trends in innovations in manufacturing as they have evolved over time. Emphasis is on understanding why changes occur in addition to what they entail. Topics: changes in the mode of production, performance objectives, sources of inspiration, factory set-up, work organization, arenas of competition, and information technology. Implications for future design.

4 units, Spr (Bailey)

268. Manufacturing Strategy—(Formerly IE 268.) For graduate students only; priority given to Manufacturing Systems Engineering. The development and implementation of the manufacturing functional strategy. Emphasis is on the integration of manufacturing strategy with the business and corporate strategies of a manufacturing-based firm. Topics: types of manufacturing technologies and their characteristics, quality management, capacity planning and facilities choice, the organization and control of operations, and determining manufacturing's role in corporate strategy. Prerequisite: 261 or 260.

3 units, Spr (Carlson)

269. Quality and Operations Management—(Formerly IE 221.) Quality is a means of survival and a strategic weapon for a firm. Using a case-based methodology, focus is on implementation issues and industrial trends from the strategic, operational, and organizational perspective. Manufacturing and service-based industries. Topics: statistical process control, inspection, experimentation, quality philosophies, customer satisfaction, etc.

4 units, Win (Kane)

270. Strategy in Technology-Based Companies—(Formerly IE 270.) For graduate students; priority given to IEEM. Introduction to the basic concepts of strategy, with emphasis on high technology firms. Topics: strategic alliances, standards setting, vertical integration, strategic choice, generic and hypercompetitive approaches, organizational capabilities, and complexity/evolutionary perspectives. Enrollment limited.

4 units, Aut (Eisenhardt)

271. Global Entrepreneurial Marketing—(Formerly IE 271.) Designed to equip an engineer with the marketing skills needed to launch and lead a high-growth, high-tech venture, cultivating the skills needed to market new products to new customers, using new technology, sometimes in a new company. The marketing challenges facing entrepreneurs who expand internationally early in the life of the company. Learning is by case method, working in teams, and with a field-based entrepreneurial project. Each student writes a strategic thinking paper. Team performance cultivates entrepreneurial leadership and teamwork skills. Prerequisites: 140, and Engineering 60. Recommended: 245, 273.

4 units, Win (Kosnik)

272. Entrepreneurial Finance—(Formerly IE 272.) Primarily for graduate engineering students. Introduction to the concepts in and around the financing of entrepreneurial companies. Focus is on teaching future general managers how to use financial perspective to make better decisions in entrepreneurial settings, including selecting financial partners, evaluating financing vehicles, and financing companies through all growth stages, from start-up through initial public offering. Prerequisites: 140, and Engineering 60. Recommended: 245.

3 units, Win (Mackenzie)

273. Technology Venture Formation—(Formerly IE 273.) Open to graduate students interested in high technology entrepreneurship. Emphasis is on how technology ventures are created. Topics: opportunity identification, market assessment, product plans, selling strategies, financing options, and teamwork. Student teams write and present a business plan. Enrollment limited. Recommended: 140, 270, 271, 272 or equivalent.

4 units, Aut, Spr (Lyons, MacLean)

274. Building Dynamic Entrepreneurial Organizations—(Formerly EES&OR 284.) Focus is on the dynamic development of corporate skills, knowledge, and infrastructure to compete in a changing global competitive environment due to rapid technology advancement, global economic development, changes in consumer's preference, and government regulations. Model analysis and case studies are used to develop a methodology in building dynamic entrepreneurial organizations in response to dynamic competitive requirements. Links between EES&OR core and the notion of managing change as a basis for a normative theory on entrepreneurial activities in new business creation and corporate expansion.

3 units, Spr (Tse)


4 units, Win (DeVilliers)

276. Managing to IPO: Control Systems—(Formerly IE 234; same as Business 319A.) How firms evolve and adapt their control/information systems when changes occur in their markets, technology, competition, and in their own internal capabilities. Emphasis is on the challenges faced by start-up and pre-IPO ventures when designing their control/information systems. Topics: target costing, activity-based management, quality and customer satisfaction, balanced scorecards, competitor cost/pricing analysis, and incentive-system design.

4 units, Win, Spr (Foster)

277. Creativity and Innovation in Organization—(Formerly IE 201.) For master's students and undergraduates (seniors only). Individual, group, and organizational perspectives on what sparks and hampers innovation. Lectures, exercises, case discussions, and group projects.

4 units, Win (Sutton)

278. Marketing for Technology-Based Companies—(Formerly IE 269.) Priority given to MS&E graduate students. Introduction to marketing strategy and execution for technology-based companies in imagination-intensive industries. Topics: market segmentation and selection, positioning, product management, pricing, channels of distribution, marketing communication. Using case studies based on real companies, students learn to diagnose problems and opportunities, make decisions, analyze customers, competitors, channels, economic and ethical issues that affect their decisions, and reality test their recommended approach. Prerequisites: 140, and Engineering 60. Recommended: 245.

4 units (Kosnik) not given 2000-01

279. Organizational Behavior, Management, and Work

280. Organization Behavior and Management—(Formerly IE 203.) Organization theory; concepts and functions of management; behavior of the individual, work group, and organization. Emphasis is on case and related discussion. Enrollment limited to 65 graduate students per section; priority given to IEEM majors.

4 units, Aut (Sutton)

281. Management and Organization of Research and Development—(Formerly IE 220.) The organization of R&D in industry and the problems of the technical labor force. Relevant theoretical perspectives from sociology, anthropology, and management theory on the social and pragmatic issues that surround technical innovation and the employment of scientists and engineers. Possible topics: organization of scientific and technical communities, industrialization of research, the nature of scientific and technical work, strategies for fostering innovation, careers of scientists and engineers, and managerial problems characteristic of R&D settings.

4 units (Barley) not given 2000-01
284. Technology and Work—(Formerly IE 223.) Theory and research on the social implications of technology and technological change for workers at all levels. Alternate conceptions of technology as social phenomenon, approaches to the study of technology in the workplace, reactions of individuals and groups to technological change, the construction of a technology's social meaning, and the management of technological change. Emphasis is on automation, electronic data processing, and sophisticated microelectronic technologies, including CAD-CAM systems, telecommunication networks, medical imaging technologies, artificial intelligence, and personal computers.

4 units (Barley) not given 2001-02

PUBLIC POLICY ANALYSIS

293. Technology in National Security—(Formerly EES&OR 293.) Undergraduate students register for 193; see 193.

3 units, Aut (Perry)

294. The Role of Analysis in Environmental Policy Decisions—(Formerly EES&OR 294.) Undergraduate students register for 194; see 194.

3-5 units, Spr (North)

298. Technology, Policy, and Management in Newly-Industrializing Countries—(Formerly IE 279; same as Science, Technology, and Society 279.) Technology is seen as the key to development and prosperity in most parts of the world. Building technological capability in newly-industrializing countries at the national and firm level. What makes technology special, government intervention that affects technology, the concept of technology leader and technology follower environments, the transfer of technology from "leader" countries, indigenous technological capability, human capital, culture and innovation, the role of small firms and new enterprises in technological capability. Managing innovation in firms: how innovation is different in technology-followers, organizing for shop-floor innovation, building an innovation culture, the special role of R&D in followers, the role of design, technology strategy for followers. Cases from Korea, India, Brazil, Singapore, and other NICs.

2-4 units (Forbes) given 2001-02

299. Voluntary Social Systems—(Formerly EES&OR 299.) Exploration of ethical theory, feasibility, and desirability of a social order in which coercion by individuals and government is minimized and people pursue ends on a voluntary basis. Topics: efficacy and ethics; use rights for property; contracts and torts; spontaneous order and free markets; crime and punishment based on restitution; guardian-ward theory for dealing with incompetents; the effects of state action-hypothesis of reverse results; applications to help for the needy, armed intervention, dealing with incompetents; the effects of state action-hypothesis of crime and punishment based on restitution; guardian-ward theory for

1-3 units, Win (Howard)

PRIMARILY FOR DOCTORAL STUDENTS

GENERAL AND SYSTEMS ANALYSIS METHODS

300. Ph.D. Qualifying Tutorial—(Formerly EES&OR 400.) Restricted to Ph.D. students assigned tutorials as part of the EES&OR Ph.D. qualifying process.

1-3 units, Aut, Win, Spr, Sum (Staff)

301. Thesis and Dissertation Research—(Formerly EES&OR 409, IE 301.) Work on dissertation for Ph.D. degree or thesis for Engineer's degree. Limited to students who have been advanced to candidacy for the degree of Ph.D. or Engineer degrees.

1 or more units, Aut, Win, Spr, Sum (Staff)

302. Optimal Dynamic Systems—(Formerly EES&OR 331.) Controllability and observability, stabilizing feedback. Optimal control theory and the Pontryagin maximum principle; problems with inequality constraints, transversality condition, discounting cost, infinite horizon problem; the Hamilton-Jacobi-Bellman equation; stochastic control. Applications: optimal economic growth, control of predator/prey systems, spread of product innovation. Prerequisite: 231.

3 units, Aut (Van Roy)

OPTIMIZATION


3 units, Aut (Cottle)

311. Optimization—(Formerly EES&OR 311.) Applications, theory, and algorithms for finite-dimensional linear and nonlinear optimization problems with continuous variables. Elements of convex analysis, first- and second-order optimality conditions, sensitivity and duality. Algorithms for unconstrained optimization, linearly constrained optimization problems (including linear and quadratic programs), and nonlinearly constrained problems. Prerequisites: Mathematics 113, 115.

3 units, Win (Cottle)


3 units, Aut (Murray)

313. Vector Space Optimization—(Formerly EES&OR 313.) Optimization theory from the unified framework of vector space theory, i.e., treating together problems of mathematical programming, calculus of variations, optimal control, estimation, and other optimization problems. Emphasizes geometric interpretation. Duality theory. Examples. Topics: vector spaces, including function spaces; Hilbert space and the projection theorem; dual spaces and the separating hyperplane theorem; linear operators and adjoints; optimization of functionals, including theory of necessary conditions in general spaces, and convex optimization theory; constrained optimization, including Fenchel duality theory. Prerequisite: Mathematics 115.

3 units, Aut (Luenberger) alternate years, not given 2001-02

316. Linear Complementarity—(Formerly EES&OR 316.) Theory of the linear complementarity problem, its applications, and algorithms for its solution. Elements of quadratic programming theory. Pivotable algebra, Schur complements, and matrix classes. Analytic existence theorems. Lemke's algorithm, the principal pivoting method and degeneracy resolution techniques. Indirect algorithms. Prerequisite: 311 or consent of instructor.

3 units, Aut (Van Roy)


3 units (Van Roy) not given 2000-01

PROBABILITY AND STOCHASTIC SYSTEMS

321. Stochastic Systems—(Formerly EES&OR 321.) Topics in stochastic processes, emphasizing applications. Markov chains in discrete and
continuous time; Markov processes in general state space; Lyapunov functions; regenerative process theory; renewal theory; martingales, Brownian motion, and diffusion processes. Application to queueing theory, storage theory, reliability, and finance. Prerequisites: 221 or Statistics 217; Mathematics 113 and 115.

3 units, Win (Glynn)

322. Stochastic Calculus and Control—(Formerly EES&OR 322.) Ito integral, existence and uniqueness of solutions of stochastic differential equations (SDEs), diffusion approximations, numerical solution of SDEs, controlled diffusions and the Hamilton-Jacobi-Bellman equation, statistical inference for SDEs. Applications to finance and queueing theory. Prerequisites: 221 or Statistics 217; Mathematics 113 and 115.

3 units, Spr (Glynn) alternate years, not given 2001-02


3 units (Glynn) alternate years, given 2001-02

INFORMATION SCIENCE AND TECHNOLOGY

334. Network Architectures and Performance Engineering—(Same as Electrical Engineering 384S.) Introduction to the modeling and control methodologies used in network performance engineering: Markov chains and stochastic modeling, queuing networks, stochastic simulation, dynamic programming, network optimization algorithms, large-scale distributed computation for networking operations etc. The application of such methodologies to key design issues in high-performance network architectures for IP networking, wireless networks, and optical networks: traffic modeling, congestion control, IP network dynamics, TCP flow control, quality of service support, network admission control and operations management, power control and dynamic bandwidth allocation in wireless networks, wavelength routing and topology design of optical networks, server placement and capacity management etc. Prerequisites: 284 and basic understanding of probability.

3 units, Spr (Bambos)

335. Queuing Systems and Networks—(Formerly EES&OR 373.) Advanced stochastic modeling and analysis of systems involving queuing delays. Markovian queues. Stability analysis of the GI/G/1 queue. Key results on single and multi-server queues. Approximation methods. Queuing networks. Introduction to controlled queuing systems. Applications to performance modeling, analysis, and evaluation of communication networks, computer systems, flexible manufacturing systems, service systems, etc. Prerequisite: 221 or equivalent.

3 units, Aut, Spr (Bambos) alternate years, not given 2001-02

336. Topics in Queuing Networks—(Formerly EES&OR 374.) Advanced efficient control and high-performance design of queuing systems involving job scheduling and resource (server) allocation. Dynamic and stochastic scheduling. Resource allocation in random environments. Real-time scheduling algorithms. Efficient control of queuing networks (routing, admission, flow control, etc.). Performance evaluation of complex queuing structures; identification of performance bottlenecks and techniques for alleviating them. General principles and methodology of high-performance design. Case studies and applications to the design of communication networks, high-speed switching, computer systems, flexible manufacturing systems, service systems, parallel and distributed processing networks, etc. Prerequisite: 335 or equivalent.

3 units (Staff) alternate years, given 2001-02


3 units, Win (Van Roy)

ECONOMICS, FINANCE, AND INVESTMENT

341. Advanced Economic Analysis—(Formerly EES&OR 341.) Builds on 241 concepts. Market structure and industrial organization (oligopoly, strategic behavior of firms, game theoretic models); economics of uncertainty; general equilibrium theory and economic efficiency (formulation, Walras’ Law, existence, uniqueness, duality between efficiency and general equilibrium; trade); intertemporal equilibrium and asset markets; macroeconomic analysis and economic growth (accounting identities, general equilibrium perspective); public goods, externalities. Background for additional advanced economics. Prerequisite: 241.

3 units, Spr (Sweeney)

342. Advanced Investment Science—(Formerly EES&OR 342.) Advanced topics and research in the theory and application of investment concepts. Topics: forwards and futures contracts, continuous and discrete time models of stock price behavior, geometric Brownian motion, Ito’s lemma, basic options theory, Black-Scholes equation, advanced options techniques, models and applications of stochastic interest rate processes, and optimal portfolio growth. Computational issues and general theory. Teams work on independent projects that apply the principles. Prerequisite: 242.

3 units, Win (Eaves)

344. Equilibrium Programming—(Formerly EES&OR 344.) Mathematical models of equilibria in economics and in conflict. Price equilibria. Extensive form games, general and partial equilibrium economic models, Nash equilibria. Solution of equilibrium models by the homotopy principle: deform the system to an easily and uniquely solved one, and follow the solution of the system as it is deformed, with retrogressions, back to the original system. Piecewise linear and differential homotopies and curve following. Subdivisions, atlases, regularity, degree, fixed points, stationary points, general and special case algorithms. Prerequisite: 211.

3 units, Win (Eaves)

346. Economic Analysis of Market Organizations—(Formerly EES&OR 346.) For second-year or more advanced graduate students. Studies microeconomics and management science to decision behavior and mechanism design in market organizations, emphasizing asymmetric information structures. Topics: game theory, economics of information, and nonlinear pricing. Applications: priority pricing of congested systems, emission trading of pollutants, design of competitive markets for electric power, competitive product pricing, etc. Prerequisites: basic knowledge of microeconomics, optimization, probability theory, and decision theory. Recommended: familiarity with mathematical modeling and skills in computer programming.

3 units, Aut (Chao)

347. Capital Investment and Financing—(Formerly EES&OR 347.) Optimal capital investment and financing decisions for firms operating in a dynamic and uncertain environment. Forecasting and valuing project cash flows. Designing and managing projects to create and capitalize on operating options and follow-on investment opportunities. Financing alternatives and the relationship between investment type and optimal financial structure. Prerequisites: basic finance theory (equivalent of 242 or Industrial Engineering 235).

3-4 units (Staff) not given 2000-01

348. Optimization of Uncertainty and Applications in Finance—(Formerly EES&OR 358.) How to make optimal decisions in the
349. Investment Science Frontiers—(Formerly EES&OR 349.) Advanced concepts of investment science with emphasis on theories and methods for solving practical problems: real options theory and practice; valuing and structuring projects, mergers, acquisition and contracts; designing portfolios for optimal growth; and managing risk and enhancing value within a complex business enterprise. Combination lecture, seminar, and project. No auditors. Prerequisites: 242, 242.

3 units (Luenberger) alternate years, given 2001-02

DECISION AND RISK ANALYSIS

350. Doctoral Seminar in Risk Analysis—(Formerly IE 340.) Limited to doctoral students. Reading/review of the literature in the fields of engineering risk assessment and management. New methods and topics, emphasizing probabilistic methods and decision analysis. Applications to risk management problems involving the technical, economic, and organizational aspects of engineering system safety. Possible topics: treatment of uncertainties, learning from near misses, and use of expert opinions.

3 units, Spr (Paté-Cornell)


3 units, Spr (Veinott)

352. Decision Analysis II—(Formerly EES&OR 352.) The extension of decision making from a system of thought about decisions to the considerations necessary for aiding other people and organizations in decision making: decision engineering. Topics: how to organize the decision conversation, the role of the decision analysis cycle and the model sequence, assessing the quality of decisions, framing decisions, the decision hierarchy, strategy tables for alternative development, creating decision diagrams that are sparse and effective, understanding and overcoming biases in assessment, developing and using evocative and assessed knowledge maps, dealing with “uncertainty about probability.” Interpretation of various forms of sensitivity analysis, use of approximations, value of revelation, value of joint information, options, flexibility, bidding, assessing and using corporate risk attitude, risk sharing and scaling, and treating decisions involving health and safety. See 353 for continuation of 352. Prerequisite: 252.

4 units, Win (Howard)

353. Decision Analysis III—(Formerly EES&OR 353.) Decision analysis beyond the basic paradigm, emphasizing determining and extending the boundaries of systematic analysis of decisions. Topics: the concept of decision composite; probabilistic insurance and other challenges to the normative approach; the relationship of decision analysis to classical inference and data analysis procedures; the likelihood and exchangeability principles; inference, decision, and experimentation using conjugate distributions; developing a risk attitude based on general properties; examination of alternative decision-aiding practices like analytic hierarchy and fuzzy approaches. Students make presentations on current research. Object is to prepare doctoral students for research and to enable all to understand the discipline at the fundamental levels. Prerequisite: 352.

3 units, Spr (Howard)

354. Topics in Financial Risk Analysis—(Formerly EES&OR 245.) Mathematical theory of: stochastic dominance, stochastic approximation, multivalued (“fuzzy”) logic. Applications in finance: arbitrage in financial markets, non-parametric approaches to prediction of financial distress, analysis of anomalies in financial markets, alternative approaches to pricing derivative securities. Analysis of financial frauds and insider trading. Prerequisites: probability at the level of EES&OR 221; fundamental finance course, e.g., EES&OR 242 or IEEM 235; facility with formal mathematical models.

3 units, Spr (De Villiers)


3 units, Win (Shachter)

PRODUCTION OPERATIONS, SERVICES, AND MANUFACTURING


3 units, Aut (Veinott)

362. Advanced Models in Production and Operations—(Formerly IE 362.) The design and operation of production-inventory systems, production scheduling, capacity planning, plant location, sequencing, assembly-line balancing, multigoal optimizations. Readings primarily from journal articles. Prerequisite: 260.

3 units, Spr (Carlson) alternate years, not given 2001-02


3 units, Win (Staff) alternate years, not given 2001-02

364. Single and Multi-Location Inventory Models—(Formerly IE 364.) Theoretical treatment of the management and control problems of inventory systems in production and distribution, with models for single and multi-location systems. Emphasis is on operating characteristics, performance measures, and optimal operating and control policies. Prerequisite: Statistics 217 or equivalent.

3 units (Hausman) alternate years, given 2001-02

primarily on deterministic models. Topics: resource allocation problems, scheduling and sequencing problems, models of flexible manufacturing systems, manufacturing cell design, and queuing network models of manufacturing systems. Prerequisites: 260 or equivalent, Engineering 62 or equivalent.

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### 367. Advances in Integrated Supply Chain Management—(Formerly IE 367.)
The integration and coordination of material, information, and financial flows in a supply chain that spans suppliers, manufacturers, distributors, logistics providers, and customers. Recent advances prepare students for research. Topics: information distortion, postponement, centralized vs. decentralized control, vendor managed inventory, logistic restructuring, incentive issues, manufacturer and retailer interface, replenishment coordination, and value of information.

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### STRATEGY, ENTREPRENEURSHIP, AND MARKETING

#### 374. Creativity and Innovation in Organizations—(Formerly IE 324.)
Draws on anthropology, economics, engineering, history, organizational behavior, psychology, and sociology to explore the meaning, determinants, and effects of creativity in organizations. Theory and research on individual creativity; creativity as a social process. Focus is on understanding, building, and testing scholarly theory about creativity. Enrollment limited to 12. Prerequisites: doctoral standing and completion of Psychology 212 and Sociology 360.

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#### 376. Strategy and Organization Doctoral Research Seminar—(Formerly IE 326.)
Review of current research at the interface between strategy policy and organization theory. Topics: top management teams and strategic decision making processes; strategic boundary issues (e.g., strategic alliances, vertical integration, and diversification); reward structure and board relationships; evolution of strategies, technology, and populations of organizations. Enrollment limited and at the discretion of instructor. Prerequisite: Sociology 360 or equivalent.

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### ORGANIZATIONAL BEHAVIOR, MANAGEMENT, AND WORK

#### 380. Doctoral Research Seminar in Organizations—(Formerly IE 320.)
Enrollment limited to Ph.D. students. Topics from current published literature and working papers. Content varies. Prerequisite: consent of instructor.

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#### 381. Doctoral Research Seminar in Work, Technology, and Organization—(Formerly IE 321.)
Enrollment limited to Ph.D. students. Topics from current published literature and working papers. Content varies. Prerequisite: consent of instructor.

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#### 382. Organizations as Social Networks—(Formerly IE 322.)
Social structures can be investigated as social networks. Organizational and inter-organizational structures may be analyzed as patterned relationships among individuals, groups, and other organizations. Such networks appear as predictors of a variety of social dynamics (attitude similarity, the diffusion of innovation, turnover, and the allocation of organizational resources). Methods for collecting and analyzing network data include graph theory, sociometry, clique detection, centrality analysis, blockmodeling, and the quadratic assignment procedure. Readings of recent published research, actual data sets, and relevant computer programs. Prerequisites: one or more courses in anthropology, organizational behavior, political science, psychology, or sociology. Recommended: course in statistics or research methods.

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### 383. Doctoral Seminar on Ethnographic Research—(Formerly IE 323.)
Designed for graduate students; upper-level undergraduates with consent of instructor. Ethnosemantic interviewing and participatory observation is emphasized. Techniques for taking, managing, and analyzing fieldnotes and other qualitative data. 15 hours per week outside of class collecting and analyzing own data. Methods texts and ethnographies offer examples of how to analyze and communicate ethnographic data. Prerequisite: consent of instructor.

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#### 385. Remote and Distributed Work—(Formerly IE 325.)
Focus is on understanding how being remote from the objects on which one works or distributed from one’s counterparts can affect productivity, interpersonal relationships, perceptions of work, information sharing, organizational structure, and other factors related to work and work effectiveness. Current research on distributed work and research in related areas that provide a theoretical foundation for understanding the impact of distance on work. Prerequisite: consent of instructor.

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### PROJECT COURSES, SEMINARS, AND WORKSHOPS

#### 401. Cases and Projects in Decision Engineering—(Formerly EES&OR 401.)
The development of communication, organization, and modeling skills as they relate to decision making in operations, strategy, and policy. Student teams compete in cases and projects. Emphasis is on problem identification, yield consideration, teamwork, project scheduling, task definition, task allocation, task amalgamation, group behavior, technical writing, public speaking, critique and defense, and the use of software, literature, principals, and experts. Enrollment limited. Prerequisites: three courses in MS&E or equivalent. Corequisites: three more courses in MS&E or equivalent.

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#### 402. Sponsored Projects in Decision Engineering—(Formerly EES&OR 402.)
Each student team addresses a project in operations, strategy, or policy as sponsored by a business, medical, or government client. Emphasis is on team interaction with the sponsor, model construction and analysis, data collection, use of literature and experts, formulation of recommendations, and communication. Enrollment limited. Prerequisites: 401, six courses in MS&E or equivalent, consent of instructor. Corequisites: three more courses in MS&E or equivalent.

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#### 406. Colloquium in Management Science and Engineering—(Formerly EES&OR 406.)
Presentation of current research and professional practice. (AU)

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#### 408. Directed Reading and Directed Studies—(Formerly EES&OR 408, IE 291.)
Directed study and research on a subject of mutual interest to student and faculty member. Prerequisite: faculty sponsor.

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#### 411. Topics in Mathematical Programming Seminar—(Formerly EES&OR 457.)
Presentations by students and invited speakers. Introduction to techniques for solving structured linear programs. A fundamental problem of the decision sciences is finding an "optimal" solution when some of the parameters of a planning or design problem (e.g., coefficients and right-hand sides of a linear program) are not known with certainty. Such problems, when converted to deterministic equivalent, were too large to solve in practice. Recent approaches that solve important classes of stochastic programs using decomposition and (importance) sampling techniques.

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430. Contextual and Organizational Issues in Human-Computer Interaction—(Formerly IE 205.) Focus is on the contextual issues associated with designing and using computer interfaces and technology, providing insights into, experience with, and ways of understanding issues in work and consumer settings that influence the design of computer interfaces. Student team projects develop skills in: observing individuals and groups of people in context, using models of work and other activity to extend their design capabilities, identifying constraints and tradeoffs on designs within the context of use, and observing and working with people in interdisciplinary design groups. Enrollment limited. Prerequisite: Computer Science 247A or consent of instructor. 4 units, Spr (Hinds)

442. Investment Projects—(Formerly EES&OR 442.) Students teams address a practical problem in investment. Faculty assist in identifying appropriate projects and in developing students' understanding of relevant analytical tools. Students assume full responsibility for project analysis and presentation to the decision maker. 4 units (Staff) not given 2000-01

444. Investment Practice—(Formerly EES&OR 444.) Project designed to enhance student's abilities to formulate and design superior solutions to financial issues in industry and the financial services sector. Short projects illustrate the basic application and implementation of investment principles. Students complete a new project from industry. Enrollment limited to 30 EES&OR students. Prerequisites: 242, 342. 4 units, Spr (R. Luenberger)

446. Transportation, Energy, and Environment Research Roundtable (TEERR)—(Formerly EES&OR 446.) Presentations and discussions of research in progress or contemplated, focused on the interplay of transportation, energy, and environmental economics and policy issues. Students present either their own research or, subject to approval, recent research by others. 1 unit (Sweeney) not given 2000-01

447. Investment Research Seminar—(Formerly EES&OR 447.) Presentation/discussion of recent research on investment. Topics vary with the current research interests of participants. Students should be actively involved in research on investment. Prerequisite: consent of instructor. 1-3 units (Staff) not given 2000-01

452. Decision Analysis Practice—(Formerly EES&OR 452.) Students trained in decision analysis (DA) theory apply their knowledge in practice. Student teams analyze the current decision of an actual decision-maker in business, medical, non-profit, or governing organizations. Teams gain experience framing and structuring a decision, developing decision models, determining trade-offs in values and preferences, and appraising the basis for decisions. Business projects typically consider capital investment, R&D, product development, or marketing and pricing decisions for major corporations, high-technology start-up businesses, or family-owned businesses around the world. Medical projects address critical diagnosis and treatment decisions in cancer, emergency medicine, gynecology, nephrology, pediatrics, pharmacology, or psychiatry. Projects include business problems, medical projects, and choices faced by non-profit charitable and educational institutions. 4 units, Spr (Holtzman, Robinson)

454. Decision Analysis Seminar—(Formerly EES&OR 454.) Discussion of current research in decision analysis and related topics presented by doctoral students and invited speakers. 1 unit, Aut, Win, Spr (Howard)

455. Intelligent Decision Systems—(Formerly EES&OR 455.) How to automate a decision analysis consultation to address large numbers of similar decisions (e.g., over the Internet), extending decision analysis (DA) beyond individual decisions to classes of decisions that share a common structure. Decision-class analysis is the foundation for intelligent decision system (IDS) design. Decision class analysis, decision diagram formulation, taxonomy of ignorance, disjoint knowledge maps, preference models, precondition-action rules, and formal decision methods; other topics depend on student interests. Projects have addressed such decision classes as: consumer purchases, personal investments, medicine, manufacturing, on-board decision-making for planetary exploration, and sailboat racing. Prerequisite: 352. Recommended: 452 (may be taken concurrently). 4 units, Spr (Holtzman)

458. Decision Structuring Seminar—(Formerly EES&OR 458.) Practical develops skills in the using of tools and techniques of decision structuring. Student teams develop the right setting and frame to structure complex decision situations. Team presentation on: a decision described in a recent news article; the issues in a business case study; and a current decision of a decision-maker in a business, medical, non-profit, or governing organization. Topics practiced: traps and tools of decision framing; up and down the decision hierarchy; creative people and the creative process; dynamics of strategy tables; inside-out and outside-in; relevance and decision diagrams; forces and dialectics; teamwork; surmounting organizational barriers when to be quick and dirty; when to be thorough and tidy; intriguing and insightful presentations; and differences and similarities in how decisions are structured in the high-tech pharmaceuticals, medical, energy, transportation, and financial industries. For students taking 452 in the following quarter, the teams and initial structuring of a decision can form the basis for a complete decision analysis project. Prerequisite: 252. Recommended: 352, 456. 2 units, Win (Holtzman, Robinson)

459. Interdisciplinary Seminar on Conflict Resolution—(Formerly EES&OR 489; same as Economics 386, Law 611, Psychology 283.) Addresses problems of conflict resolution and negotiation from an interdisciplinary perspective. Presentations by faculty and by scholars from other universities. 1-2 units, Win (Arrow, Ross, Wilson, Alexander)

464. Global Project Coordination—(Formerly IE 264.) Students engage in projects that are local in nature, and which are related to the planning and design of supply chains and product development. Project teams from Stanford and an overseas university work on common projects using telephones, faxes, emails, internet, video-conferencing, face-to-face meetings, etc. As part of the project, students travel to Hong Kong or the Netherlands. 3 units, Win (Tabrizi) Spr (Kopczak)

472. Industry Thought Leaders Seminar—(Formerly IE 292.) Dialogue with leading entrepreneurs, corporate executives, venture capitalists, and technology leaders from Silicon Valley and around the world. A prominent entrepreneur or other industry thought leader provides cutting-edge ideas and pragmatic lessons, creating a gathering place for Stanford's extended entrepreneurial community. Autumn: strategy. Winter: entrepreneurial marketing. Spring: entrepreneurial leadership. 1 unit, Aut (Eisenhardt) Win (Kosnik) Spr (Byers)

473. Project Course in Strategy Modeling—(Formerly EES&OR 483.) The design and application of formal models in the study of strategic planning problems. Problems involving issues of technology development, resource management, and uncertainty in a corporate setting. Emphasis is on the integrated utilization of modeling tools drawn from diverse methodologies and the requirements for successful application in a policy-making or corporate strategy context. Links between art, theory, and practice are emphasized. Prerequisites: 211, 241, and 252 or equivalent. Recommended: some background in finance and marketing. 4 units, Spr (Weyant)

479. Management of Technological Enterprises Seminar—(Formerly EES&OR 479.) Speakers from industry on leading edge technologies
and their management. Seminar series focus is on the electronic foodchain in the Internet age, primarily semiconductor, computer, telecommunication, and software industry experts and executives. Objectives: provide insights into industry dynamics and economics, and the development of strategies to succeed in a volatile marketplace crowded with mature and emerging technologies; and to help synthesize the variety of systems approaches learned in “solving” key strategic issues faced by the high tech industry.

1 unit, Spr (Tse)

493. Decision Making and National Security Problems—(Formerly EES&OR 493.) Seminar for graduate students with an interest in government decision making in areas which involve a technological component, e.g., defense, energy, and environment, and high-technology trade and policy. Follows 193 or 194.

3 units, Spr (Perry)

495. Quantitative Analysis of Public Policy Decisions—(Formerly EES&OR 495.) A current public policy problem is addressed as a single project team, completing the major phases of analysis during the quarter: framing, modeling, data gathering, evaluation, and communication. Instructor coaches the team and provides guidance on gaps in the team’s knowledge. Past topics: environmental, health, technology, and transportation issues. Enrollment limited. Prerequisites: 211, 231, 241, 252, or equivalents, or consent of instructor.

3 units, Spr (Borison)

498. Medical Modeling Workshop—(Formerly EES&OR 498.) Discussion of current research in quantitative medical modeling by students, faculty, and invited speakers.

1 unit, Aut, Win, Spr (Shachter)

MATERIALS SCIENCE AND ENGINEERING


Chair: Bruce M. Clemens

Associate Chair: Reinhold H. Dauskardt


Associate Professor: Reinhold H. Dauskardt

Assistant Professors: Michael D. McGehee, Paul C. McIntyre, Charles B. Musgrave, Shan X. Wang

Professor (Research): Robert S. Feigelson

Courtesy Professors: Curtis W. Frank, James S. Harris, James D. Plummer, Jonathan F. Stebbins

Courtesy Associate Professor: Huajian Gao

Courtesy Assistant Professor: Kyeongjae Cho

Acting Assistant Professor: Jonathan Doan

Consulting Professors: Paul A. Flinn, Michael A. Kelly, Thomas Marieb, Jeffrey Wadsworth

Consulting Assistant Professor: Keith W. Rollag

The Department of Materials Science and Engineering is concerned with the relation between the structure and properties of materials, factors that control the internal structure of solids, and processes for altering the structure and properties of solids. It brings together in a unified discipline the developments in physical metallurgy, ceramics, and the physics and chemistry of solids. The undergraduate program, described under the “School of Engineering” section of this bulletin, provides training for the materials engineer and also preparatory training for graduate work in materials science. Capable students are encouraged to take at least one year of graduate study to extend their course work. Coterterminal degree programs are encouraged both for undergraduate majors in Materials Science and Engineering and for undergraduate majors in related disciplines. Graduate programs lead to the degrees of Master of Science, Engineer, and Doctor of Philosophy.

FACILITIES

The department is based in the Thomas F. Peterson Engineering Laboratory (Building 550), with extensive facilities in the newly renovated McCullough building and the new McCullough Annex. Between Peterson and the new McCullough complex are housed offices for the chair and most of the faculty, for the administrative and technical staff, and for most graduate students, along with a number of lecture and seminar rooms. Facilities for teaching and research are also available, including equipment for electrical measurements; mechanical testing of bulk and thin film materials; fracture and fatigue of advanced materials; metallurgy; optical, scanning, transmission electron microscopy and atomic force microscopy; UHV sputter deposition; vacuum annealing treatments; wet chemistry; and x-ray diffraction. The McCullough Complex is also the home for the Center for Research on Information Storage Materials (CRISM) with corresponding facilities for magnetic measurements. The Rapid Prototyping Laboratory (RPL), housing material deposition and removal stations, is a joint facility with Mechanical Engineering, and is housed next to the Peterson Labs in Building 530. The department maintains two microcomputer clusters for its students, one with a number of Macintosh and Windows computers, and the other with five HP and DEC workstations. Both clusters are linked with the worldwide Internet network.

Depending on the needs of their program, students and faculty also conduct research in a number of other departments and independent laboratories. Chief among these are the Center for Integrated Systems (CIS), the Center for Materials Research (CMR), and the Stanford Synchrotron Radiation Laboratory (SSRL).

The Center for Integrated Systems (CIS) is a laboratory joining government and industrially funded research on microelectronic materials, devices, and systems. It houses a 10,000 square foot, class 100 clean room for Si and GaAs integrated circuit fabrication; a large number of electronic test, materials analysis, and computer facilities; and office space for faculty, staff, and students. In addition, CIS provides start-up research funds and maintains a “Fellow-Mentor” program with industry.

For information on CMR and SSRL, see the “Center for Materials Research” and “Stanford Synchrotron Radiation Laboratory” sections of this bulletin.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

The undergraduate program provides training in solid state fundamentals and in physical metallurgy. Students desiring to specialize in this field during their undergraduate period may do so by following the curriculum outlined in the “School of Engineering” section of this bulletin as well as the School of Engineering Undergraduate Handbook. The University’s basic requirements for the bachelor’s degree are discussed in the “Undergraduate Degrees” section of this bulletin. Electives are available so that students with broad interests can combine materials science and engineering with work in another science or engineering department.

For information about an MSB minor, see the “School of Engineering” section of this bulletin.

COTERMINAL B.S./M.S. PROGRAM

Stanford undergraduates who wish to continue their studies for the Master of Science degree in the coterminous program should apply for entrance after the beginning of the eighth quarter of undergraduate work and before the end of the eleventh quarter. The application must give evidence that the student possesses the potential for strong academic performance at the graduate level. Each application is evaluated by the department’s Admissions Committee. Scores from the Graduate Record Exam (GRE) General Test must be reported before action can be taken on an application. Materials science is a highly integrated and interdisci-
ciplinary subject, and so applications from students of any engineering or science undergraduate major are encouraged. Information forms pertaining to the coterminal program may be obtained from the department's Student Resource Center, room 550B, or from Degree Progress in the Registrar's Office, Old Union. Students entering the coterminal program and receiving both their B.S. and M.S. degree in Materials Science and Engineering should also see the "Master of Science for MS&E Coterminal Students" section below.

GRADUATE PROGRAMS

Graduate students can specialize in any of the areas of materials science and engineering. In collaboration with other departments of the University, additional special programs are available.

MASTER OF SCIENCE

The University’s basic requirements for the M.S. degree are discussed in the “Graduate Degrees” section of this bulletin. The following are specific departmental requirements.

The Department of Materials Science and Engineering (MSE) requires a minimum of 45 units for a master’s degree. Up to 9 units of work done as a graduate student at another institution may sometimes be transferred to give unit credit toward the electives used in acquiring a Stanford degree. Substitution of courses taken for specific Stanford courses is approved on the Master’s Proposal Proposal. Master’s Proposal forms should be filled out, signed by the students’ academic adviser, and submitted to the department’s Student Services Coordinator by the end of the first week of the students’ second quarter of study. (Generally, this means by the end of the first week of Winter Quarter.) Final changes to the master’s program must be submitted no later than one academic quarter prior to degree conferral.

Degree requirements (for students entering after September 1, 1997) are as follows:

1. A minimum of 33 units of MSE course work, including cross-listed courses, taken for a letter grade. The following are limitations:
   a) A maximum of 9 units of cross-listed courses may be used in fulfilling this requirement.
   b) One-unit seminars and research units cannot be used to fulfill this requirement.
2. Lab courses MSE 171, 172, 173 (which count toward the required 33 units of MSE course work).
   Note: students who have had equivalent lab courses at other universities, equivalent practical experience, or have a materials related degree or background are expected to file a petition with the department’s Student Services Coordinator to have this requirement waived.
3. Six courses selected from MSE 152, 251, and 201 through 209. These “core” courses count towards the required 33 units of MSE course work. However:
   a) MSE 152 is not an option for students with materials science undergraduate degrees.
   b) MSE 251 may not be used to fulfill this "core" requirement if the student has a materials science undergraduate degree, although it may be applied towards the required 33 units of MSE course work.
4. Approved course electives to bring total units to 45. Of the 12 units of elective courses:
   a) Nine of the 12 units must be taken for a letter grade.
   b) A maximum of 3 units may be seminars.
   c) If writing a Master’s Research Report, a minimum of 6 and a maximum of 9 units of MSE Research units may be used.
   d) A maximum of 3 units may be undergraduate units (offered at Stanford University).
   e) A maximum of 5 units may be used for a foreign language course (not including any remedial English courses).
   f) The combination of seminar, undergraduate, and language units may not exceed 6 units total.
   g) The combination of research, seminar, undergraduate, and language units may not exceed 12 units total. (Research units are only allowed when writing a Master’s Research Report.)
5. A minimum grade point average (GPA) of 2.75 for course work at Stanford.

All proposed degree programs are subject to approval by the department’s Academic Degree Committee, which has responsibility for assuring that each proposal is a technically coherent program.

PETITION PROCESS FOR TRANSFER FROM M.S. TO PH.D. DEGREE PROGRAM

When a student is admitted to the graduate program, he or she is admitted specifically into either the M.S. or the Ph.D. program. Admission to the Ph.D. program is required for the student to be eligible to work towards the Ph.D. degree. A student in the M.S. program can petition to be admitted to the Ph.D. program by filing an M.S. to Ph.D. Transfer Petition.

This petition must be accompanied by a one-page statement of purpose stating the reasons why the student wishes to transfer to the Ph.D. program, and two letters of recommendation from members of the Stanford faculty, including one from the student’s prospective adviser and at least one from an MSE faculty member belonging to the Academic Council.

The M.S. to Ph.D. Transfer Petition is due to the Student Services Coordinator by the end of the second week of Spring Quarter during the student’s first year in the M.S. program. Only students enrolled in the 200 series core-course sequence are eligible to petition, and a grade point average (GPA) of 3.25 or better in the first two quarters of the core-course sequence is required.

Transferring to the Ph.D. program is a competitive process and only fully qualified M.S. students are admitted. The Admissions Committee and the department chair consider the student’s original application to the graduate program as well as the material provided with the transfer petition. Decisions regarding these petitions are normally available by the fourth week of Spring Quarter.

M.S. RESEARCH REPORT

Students wishing to take this option must submit a program of study, including not more than 9 and no less than 6 MSE research units, to the department for approval at least two quarters before the degree is granted. The total combined units of MSE research units, seminars, language courses, and undergraduate courses cannot exceed 12. If a master’s research report is not to be submitted, units of MSE 200 cannot be applied to the department’s requirement of 45 units for the master’s degree.

The report must be approved by two faculty members. One faculty member is the student’s research adviser. The other faculty member is assigned by the department. Three copies of the report (one copy for each approving faculty member and the department library), in final form and signed by two faculty members, must be in the hands of the department’s Student Services Coordinator one week prior to the beginning of the final examination period of the final quarter of the program. The report is not an “official” University thesis but rather is intended to demonstrate to the department faculty an ability to conduct and report directed research. The Master’s Report is not appropriate for students wishing to petition for the Ph.D. program. Refer to the Materials Science and Engineering Student Handbook for more information and further clarification concerning this report.

M.S. FOR MSE COTERMINAL STUDENTS

The University’s basic requirements for the M.S. degree are discussed in the “Graduate Degrees” section of this bulletin. The following are specific departmental requirements.

The Department of Materials Science and Engineering (MSE) requires a minimum of 45 units for a master’s degree. Students who have received or are currently working towards a B.S. degree in Materials Science and Engineering from Stanford and are pursuing a M.S. in Materials Science and Engineering should follow the requirements below in lieu of those stated in the “Master of Science” section listed above. Master’s Program Proposal forms should be filled out, signed by the students’ academic adviser, and submitted to the department’s Student Services Coordinator by the end of the first week of the students' second
quarter of study. (Generally, this means by the end of the first week of Winter Quarter.) Final changes to the master’s program must be submitted no later than one academic quarter prior to degree conferral. Degree requirements (for students who entered after September 1, 1997) are as follows:

1. A minimum of 21 units of MSE course work taken for a letter grade. Crosslisted courses, 1-unit seminars, research units and/or MSE 400 cannot be used to fulfill this requirement. These 21 units of MSE courses must include:
   a) The three remaining core classes (MSE 191/201 to 199/209) not taken for the B.S. degree in MSE.
   b) Twelve units of non-crosslisted MSE 300-level courses (not including 300).
2. Approved course electives to bring the total units to 45. Of the 24 units of elective courses:
   a) Twenty-one of the 24 units must be taken for a letter grade.
   b) A maximum of 3 units may be seminars.
   c) If writing a Master’s Research Report, a minimum of 6 and a maximum of 9 units of M.S. research units (MSE 200) may be used.
   d) A maximum of 6 units may be undergraduate units.
   e) A maximum of 5 units may be used for a foreign language course (not including any remedial English courses).
   f) The combination of seminar, undergraduate, and language units may not exceed 9 units total.
   g) The combination of research*, seminar, undergraduate, and language units may not exceed 15 units total.
3. A minimum grade point average (GPA) of 2.75 for course work at Stanford.

* See the Master’s Research Report section listed above, noting the additional unit privileges allotted to coterminal students. See the department's Student Services Coordinator for more information and/or clarification on what constitutes an approved course.

### Engineer

The University’s basic requirements for the degree of Engineer are outlined in the “Graduate Degrees” section of this bulletin.

A student wishing to enter the Engineer program must have completed the substantial equivalent requirements of the M.S. in Materials Science and Engineering, and must file with the department’s Student Services Coordinator a petition requesting admission to the program, as well as stating the type of research to be done and the professor who will be supervising. Once approved, the Application for Candidacy must be submitted to the department’s Student Services Coordinator a petition requesting admission to the program, as well as stating the type of research to be done and the professor who will be supervising. Once approved, the Application for Candidacy must be submitted to the department’s Student Services Coordinator by the end of the first week of the preceding quarter. Final changes to the master’s program must be submitted no later than one academic quarter prior to degree conferral.

1. Complete the requirements for the M.S. in Materials Science and Engineering (MSE), unless receiving residency credit for completing a master’s degree elsewhere.
2. Pass a departmental oral qualifying examination the second year after admission. A GPA of 3.25 from the nine core classes (201-209) is required for admission to the Ph.D. qualifying exam. Students whose GPA is between 3.00 and 3.25 may petition for possible admission to the exam. Students who have passed the departmental oral examination are required to complete the Application for Candidacy for the Ph.D. degree by the end of the quarter in which they pass the exam. Final changes in the Application for Candidacy form must be submitted no later than one academic quarter prior to degree conferral.

3. Submit a program consisting of at least 72 units, which contains a minimum of 57 technical course units. Of these 57 units, 42 must be taken as non-cross listed MSE courses. A maximum of 12 units of cross-listed MSE courses can be applied toward this requirement, and 9 units of non-MSE technical courses can be used. The 42 units of MSE courses must be taken for a letter grade. The remaining units may consist of research, seminars, language classes, and so on. The program for the M.S. and Ph.D. combined must include the following:
   a) MSE 201 through 209 (27 units), except for students who have had equivalent courses at other universities and have successfully petitioned out.
   b) A minimum of 12 units of 300-level courses from the MSE faculty (not including MSE 300).
   c) A minimum of 12 units of courses taken from one of the following lists of Advanced Specialty Courses (see below). Some and/or all of these courses can be the same as the courses used to meet requirement ‘3b’ above; however, the units may not be counted twice.
4. Maintain a GPA of 3.0 for all course work taken as a graduate student at Stanford.
5. Present the result of the dissertation at a department seminar immediately preceding the University Oral examination.

### Advanced Specialty Courses

Materials Characterization: Elect. Engr. 329, 331; MSE 320, 321, 322, 323, 324, 325
Synthesis and Processing Materials: Chem. Engr. 310A, 310B, 340, 345, 460; MSE 313, 315; Mech. Engr. 262A

### COURSES

(WIM) indicates that the course meets the Writing in the Major requirements. (AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

#### PRIMARILY FOR UNDERGRADUATES

50. Introductory Science of Materials—(Enroll in Engineering 50.)
   4 units, Win (Bravman)
   Spr (Sinclair)

100. Undergraduate Independent Study—Independent study in materials science under supervision of a faculty member.
   1-3 units, any quarter (Staff)

150. Undergraduate Research—Participation in a research project.
   3-6 units, any quarter (Staff)

151. Microstructure and Mechanical Properties—For undergraduates; see 251. Prerequisite: Engineering 50 or equivalent.
   3 units, Aut (Dauskardt)

152. Electronic Materials Engineering—Materials engineering for information technology applications. The fundamental electrical, optical, and magnetic properties of materials. Production of semiconductor

159Q. Stanford Introductory Seminar: Research in Japanese Companies—Preference to sophomores. The home-campus equivalent of the course taught at Kyoto. Knowledge from this research, and company visits, is evaluated in a seminar/discussion setting. Lecture/discussion on the structure of a Japanese company from the point-of-view of Japanese society. Visiting researchers from Japanese companies, with brief presentations and extensive question and answer periods, explore the Japanese research ethic.

3 units, Spr (McIntyre)


4 units, Aut (Doan)


4 units, Win (Doan)

163. Materials Science Lab III—For undergraduates. Lab on experimental techniques for the study of the mechanical properties of materials, including fracture toughness testing of metallic materials, ductile-to-brittle transition curves, fracture of ceramics using indentation techniques, and effects of grain size on yielding and strain hardening. Prerequisites: 198/208, 151/251, or equivalent.

4 units, Spr (Nix)

169Q. Stanford Introductory Seminar: Issues in Science and Christianity—Preference to sophomores. Insights as provided by modern science and the Christian perspective, and ways to integrate them. Seven patterns that have been used in the effort to describe the interaction between them. Consideration of contemporary issues such as creationism vs. evolution, determinism vs. free will, issues at the beginning and ending of life, and responsibility for the environment.

3 units, Win (Babe)

170. Materials Selection in Design—For undergraduates; see 270. Prerequisites: Engineering 14 and 50 or Mechanical Engineering 111.

3 units (Prinz) alternate years, given 2001-02

171. Materials Science Lab I—For graduates; see 161. Prerequisite: Engineering 50 or equivalent.

3 units, Aut (Doan)

172. Materials Science Lab II—For graduates; see 162. Prerequisite: 193/203.

3 units, Win (Doan)

173. Materials Science Lab III—For graduates; see 163. Prerequisites: 198/208, 151/251, or equivalent.

3 units, Spr (Nix)

179Q. Stanford Introductory Seminar: Materials in Sports—Preference to sophomores. Introduction to materials science using sporting equipment as a vehicle to highlight material properties, performance, and selection criteria. The classes of material, and the properties relevant to sporting equipment performance. Examples from modern sporting equipment (golf clubs, tennis rackets, skis, and bicycles) highlight the relationship between material properties and product performance.

3 units, Spr (McIntyre)

191. Mathematical and Computational Methods in Materials Science—For undergraduates; see 201. Prerequisite: familiarity with ordinary differential equations.

4 units, Aut (Barnett)

192. Solid State Thermodynamics—For undergraduates; see 202. Prerequisite: physical chemistry or introductory thermodynamics.

4 units, Aut (Musgrave)

193. Atomic Arrangements in Solids—For undergraduates; see 203.

4 units, Aut (Sinclair)

194. Phase Equilibria—For undergraduates; see 204. Prerequisite: 192/202.

4 units, Win (McIntyre)

195. Waves and Diffraction in Solids—For undergraduates; see 205. Prerequisite: 193/203 or consent of instructor.

4 units, Win (Clemens)

196. Imperfections in Crystalline Solids—For undergraduates; see 206. Prerequisite: 193/203.

4 units, Win (Nix)

197. Rate Processes in Materials—For undergraduates; see 207. Prerequisites: 191/201, 192/202, 194/204.

4 units, Spr (Clemens)

198. Mechanical Properties of Materials—For undergraduates; see 208. Prerequisites: 193/203, 196/206.

4 units, Spr (Dauskardt)

199. Electrical and Magnetic Properties of Solids—For undergraduates; see 209. Prerequisite: 195/205 or equivalent.

4 units, Spr (Wang)

PRIMARILY FOR GRADUATES

200. Master’s Research—Participation in a research project.

1-15 units, any quarter (Staff)

201. Mathematical and Computational Methods in Materials Science—Use of matrix and tensor analysis, with applications to the effects of crystal symmetry on physical property tensors related to elastic deformation, thermal expansion, diffusion, electricity and magnetism, piezoelectricity, and thermodynamics. Selected topics in elementary waves in solids, analytical and numerical solutions of the one-dimensional diffusion equation, or an introduction to the use of the calculus of variations. Assignments use Mathematica.

3 units, Aut (Barnett)


3 units, Aut (Musgrave)

203. Atomic Arrangements in Solids—Atomic arrangements in perfect and imperfect crystalline solids, defect chemistry, and elements of formal crystallography, including development of point groups and space groups.

3 units, Aut (Sinclair)
3 units, Win (McIntyre)

205. Waves and Diffraction in Solids—The elementary principals of x-ray, vibrational, and electron waves in solids. Basic wave behavior including Fourier analysis, interference, diffraction, and polarization. Examples of wave systems, including electromagnetic waves from Maxwell’s equations. Diffracted intensity in reciprocal space and experimental techniques such as electron and x-ray diffraction. Lattice vibrations in solids, including vibrational modes, dispersion relationship, density of states, and thermal properties. Free electron model. Basic quantum mechanics and statistical mechanics including Fermi-Dirac and Bose-Einstein statistics. Prerequisite: 193/203 or consent of instructor.
3 units, Win (Nix)

3 units, Win (Nix)

3 units, Spr (Clemens)

3 units, Spr (Dausskardt)

209. Electrical and Magnetic Properties of Solids—Introduction to the electronic, magnetic, optical, and ferroelectric properties of solids. Emphasis is on concepts and models of phonons and electronic energy bands as applied to metals, semiconductors, magnetic materials, and insulators. Elementary quantum and statistical mechanics concepts are utilized. Prerequisite: 195/205 or equivalent.
3 units, Spr (Wang)

1-15 units, any quarter (Staff)

227. Scattering Physics—(Enroll in Applied Physics 196.)
4 units, not given 2000-01

230. Materials Science Colloquium—Can be repeated for credit. (AU)
1 unit, Aut (Clemens, Barnett)
Win (Dausskardt, Sinclair)
Spr (McIntyre, Nix)

251. Microstructure and Mechanical Properties—Primarily for students without a materials background. Mechanical properties and their dependence on microstructure in a range of engineering materials.

3 units (Nix) alternate years, given 2001-02

260. Advanced Dislocation Theory—The mathematical theory of dislocations and how to apply it. Possible topics: elastic Green’s functions, formula of Volterra and Mura, specializing the results, self-energies of dislocations in 2-D and 3-D, interaction energies in elasticity, the Lothe-Brown formula; and forces on dislocation elements due to other dislocations, surfaces, and sources of applied stress.
3 units (Barnett) alternate years, given 2001-02

3 units (Prinz) alternate years, given 2001-02

299. Practical Training—Provides educational opportunities in high-technology research and development labs in industry. Qualified graduate students engage in internship work and integrate that work into their academic program. Following the internship, students complete a research report outlining their work activity, problems investigated, key results, and any follow-on projects they expect to perform. Meets the requirements for Curricular Practical Training for students on F-1 visas. Student is responsible for arranging own employment. See department Student Services Coordinator before enrolling. Can be repeated for credit.
1 unit, any quarter (Staff)

300. Ph.D. Research—Participation in a research project.
1-15 units, any quarter (Staff)

310. Integrated Circuit Fabrication Processes—(Enroll in Electrical Engineering 212.)
3 units, Aut (Plummer)

312. New Methods in Thin Film Synthesis—Techniques to grow thin films on an atomic scale provide the materials base for new classes of coatings and devices. The fundamentals of vacuum growth techniques, molecular beam epitaxy (MBE), chemical vapor deposition (CVD), ion beam assisted deposition, and plasma processes. Relationships between deposition parameters and film properties. Industrial applications of thin film synthesis.
3 units, Aut (Clemens)

313. Principles of Ceramics Processing—Fundamental description of the unit process operations used to fabricate polycrystalline ceramic components. Topics: grain growth, solid state and liquid phase sintering, drying, ceramic forming processes, beneficiation, introductory rheology, particle packing, size/shape effects, influence of processing additives, powder synthesis through solid state reactions and wet chemical methods. Prerequisites: 204 and 207, or their equivalents.
3 units, Aut (McIntyre) alternate years, not given 2001-02
315. Polymer Physics—(Enroll in Chemical Engineering 460.)
3 units, Spr (Frank) alternate years, not given 2001-02

316. Nanoscale Science, Engineering, and Technology—The techniques for patterning materials at the nanometer length scale: self-assembly, electron beam lithography, scanning probe lithography, and epitaxy. Electrical, optical, magnetic, chemical, and mechanical properties of nanostructured inorganic/organic hybrids, synthetic and biological supramolecules (e.g., dendrimers, liquid crystals, proteins, DNA), epitaxially grown films, nanoparticles, nanotubes, nanowires, self-assembled monolayers, and molecular wires. The hierarchical design of materials, molecular electronics, biomimetics, and scanning probe microscopy.
3 units, Aut (McGehee)

317. Advanced Integrated Circuit Fabrication—(Enroll in Electrical Engineering 311.)
3 units, Spr (Saraswat)

318. Integrated Circuit Fabrication Laboratory—(Enroll in Electrical Engineering 410.)
3-4 units, Win (Saraswat)

319. Electron and Ion Beams for Semiconductor Processing—(Enroll in Electrical Engineering 217.)
3 units, Spr (Pease) alternate years, not given 2001-02

3 units (Saraswat) alternate years, given 2001-02

321. Transmission Electron Microscopy—Image formation and interpretation. The contrast phenomena associated with perfect and imperfect crystals from a physical point of view and from a formal treatment of electron diffraction theory. The importance of electron diffraction to systematic analysis and recent imaging developments. Prerequisite: 193/203, 195/205, or equivalent.
3 units, Win (Saraswat)

322. Thin Film and Interface Microanalysis—The science and technology of a variety of microanalytical techniques, including Auger electron spectroscopy (AES), Rutherford backscattering spectroscopy (RBS), secondary ion mass spectroscopy (SIMS), ion scattering spectroscopy (ISS), and x-ray photoelectron spectroscopy (XPS or ESCA). Generic processes such as sputtering and high-vacuum generation. Prerequisite: some prior exposure to atomic and electronic structure of solids.
3 units, Aut (McGehee) alternate years, given 2001-02

323. Selected Topics in Thin Film Microcharacterization—Case-study characterizing materials, defining problems in characterizing surfaces or thin films, carrying out analyses of relevant samples, and reporting the results. Students operate modern electron, ion, and x-ray probe instruments to study samples. Methodology for approaching characterization problems; experience in interpreting and presenting experimental results. Emphasis is on the application of theoretical measurement capabilities to practical problems, and the capabilities and limitations of modern techniques. Topics: choosing the appropriate techniques, analytical pitfalls, quantitative analysis, effects of noise and other uncertainties on analytical precision. Enrollment limited. Prerequisite: 323 or consent of instructor.
3 units, Win (Saraswat) alternate years, not given 2001-02

324. X-Ray Diffraction—Diffraction theory and its relationship to structural determination in solids. Focus is on applications of x-rays; concepts can be applied to neutron and electron diffraction. Topics: Fourier analysis, kinematic theory, Patterson functions, diffraction from layered and amorphous materials, single crystal diffraction, dynamic theory, defect determination, surface diffraction, techniques for data analysis, and determination of particle size and strain. Prerequisites: 193/203, 195/205.
3 units (Clemens) alternate years, given 2001-02

325. Scattering Physics—(Enroll in Applied Physics 218.)
3 units, not given 2000-01

3 units (McIntyre) alternate years, given 2001-02

334. Basic Physics for Solid State Electronics—(Enroll in Electrical Engineering 228.)
3 units, Aut (J. Harris)

335. Properties of Semiconductor Materials—(Enroll in Electrical Engineering 327.)
3 units, Win (J. Harris)

336. Physics of Advanced Semiconductor Devices—(Enroll in Electrical Engineering 328.)
3 units, alternate years, given 2001-02

341. Principles and Models of Semiconductor Devices—(Enroll in Electrical Engineering 216.)
3 units, Aut (Saraswat)

342. The Electronic Structure of Surfaces and Interfaces—(Enroll in Electrical Engineering 329.)
3 units, Aut (Pianetta) alternate years, not given 2001-02

3 units, Spr (McGehee)
348. Principles of Magnetic Recording—Fundamental understanding and applications of magnetic recording. Read and write processes, inductive and MR and GMR heads, thin film and particular media, medium and head noise, head-media interface. Technology trends and recording system issues introduced. Prerequisite: 347 or equivalent or consent of instructor.

3 units, Aut (Wang) alternate years, not given 2001-02

349. Introduction to Information Storage Systems—(Enroll in Electrical Engineering 335.)

3 units, Win (Wang)

350. Micromechanics—Use of the theory of elasticity to discuss fields of dislocations, inclusions, inhomogeneities, and their interactions in deformable solids. Applications to the microscopic foundations of macrosopic plasticity, the effects of strain energy on morphologies associated with phase transformations, and the determination of “effective” properties of composite media. Prerequisite: any brief introduction to the theory of elasticity, or consent of instructor.

3 units, Win (Barnett)

351. Microstructural Design of Advanced Materials and Composites—Strategies for the control of mechanical properties through microstructural design in a range of engineering materials and their composites. Emphasis is on a fracture mechanics description of strengthening and toughening methods in advanced ceramics and various composites. The structural reliability of brittle materials systems and their relationship to microstructure and processing in terms of fracture statistics, and long-term properties in terms of subcritical crack-growth processes with examples and applications, including cyclic fatigue and high-temperature creep of metals and ceramics. Prerequisites: basic understanding of materials microstructure, mechanical properties, and fracture mechanics; 251 and 358, or equivalents.

3 units, Spr (Dauskardt)

352. Stress Analysis of Thin Films and Layered Composite Media—Introduction to methods of stress analysis of layered dissimilar media, including thin films deposited on substrates, composite laminates, and stratified anisotropic elastic materials based on techniques pioneered by Stroh. Stress states generated by thermal and elastic mismatch and local stress concentrations at interfacial cracks or corners with applications to integrated circuit devices, aircraft materials, and geophysical media. Prerequisites: introductory course on the strength of materials or the theory of elasticity, some familiarity with matrix algebra.

3 units, Win (Barnett) alternate years, not given 2001-02


3 units (Nix) alternate years, given 2001-02

354A. Theory and Applications of Elasticity—(Enroll in Mechanical Engineering 240A.)

3 units, Win (Gao)

354B. Introduction to Fracture Mechanics—(Enroll in Mechanical Engineering 240B.)

3 units, Spr (Gao)

355. Time-Dependent Plasticity—Theories and mechanisms of creep. Temperature and strain rate effects on the plastic flow of solids. The relation of high temperature strength and ductility of materials to structure. Prerequisite: 198/208.

3 units (Nix) alternate years, not given 2001-02

356. Fatigue Design and Analysis—(Enroll in Mechanical Engineering 245.)

3 units, Win (Nelson)

357. Physical Solid Mechanics—(Enroll in Mechanical Engineering 229.)

3 units, Spr (Cho)


3 units, Win (Dauskardt)

359. Crystalline Anisotropy—Introductory matrix and tensor analysis with applications to the effects of crystal symmetry on elastic deformation, thermal expansion, diffusion, piezoelectricity, magnetostriction, and thermodynamics, following a treatment at the level of Nye's text. Homework sets use Mathematica™.

3 units (Barnett) alternate years, not given 2001-02

360. Techniques of Failure Analysis—(Enroll in Aeronautics and Astronautics 252.)

2 units, Spr (Ross)

361. Mechanics of Composites—(Enroll in Aeronautics and Astronautics 256.)

3 units, Win (Springer)

400. Participation in Materials Science Teaching—Can be repeated for credit.

1-3 units, Aut, Win, Spr (Staff)

405. Seminar in Applications of Transmission Electron Microscopy—Can be repeated for credit. (AU)

1 unit, Aut, Win, Spr (Sinclair)

459. Frontiers in Interdisciplinary Biosciences—Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible. Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford’s Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

2 units, Aut, Win, Spr (S. Block)
MECHANICAL ENGINEERING


Chair: Ronald K. Hanson

Associate Chair for Student Services: M. Godfrey Mungal

Associate Chair for Faculty Affairs: Mark R. Cutkosky

Associate Chair for Graduate Curriculum and Admissions: Parviz Moin

Division Chairs: Thomas F. Andriacchi, Scott Delp (co-chairs, Biomechanical Engineering), Mark Cappelli, (Thermosciences Division), Thomas J. R. Hughes (Mechanics and Computation); (the Design Division, and the Flow Physics and Computation Division operate without a chair)

Laboratory Directors: David W. Beach (Program Director, Manufacturing Systems Engineering and Product Realization Laboratory), J. Edward Carryer (Smart Product Design Laboratory), Mark R. Cutkosky (Manufacturing Sciences Lab and Manufacturing Models Laboratory), Dennis R. Carter (Veterans Affairs Rehabilitation R&D Center), John K. Eaton (Heat Transfer and Turbulence Mechanics), Larry J. Leifer (Center for Design Research and Stanford Learning Lab), Reginald E. Mitchell (High Temperature Gasdynamics), Parviz Moin (Center for Turbulence Research), Friedrich B. Prinz (Rapid Prototyping Laboratory)


Associate Professors: Mark A. Cappelli, Scott L. Delp, Rolf A. Faste, Kenneth E. Goddard, Kosuke Ishii, David M. Kelley, Thomas W. Kenny, Sanjiva Lele, Reginald E. Mitchell, Sheri D. Shappard

Assistant Professors: Kyeongjae Cho, Christopher Edwards, J. Christian Gerdes, Jean H. Hegarda, Juan G. Santiago

Professors (Research): Richard Christensen, Paul Durbin, Kenneth Waldron, Kenneth Waldron, Felix E. Zajac

Professor (Teaching): David W. Beach

Courtesy Professors: George S. Springer, Paul Yock

Consulting Associate Professor: Fu-Ruo Chang

Honorary Professor (Research): Charles A. Taylor

Senior Lecturer: J. Craig Milroy

Lecturers: Eugene Alexander, Michael Barry, Albert Makino, Neal Moore, Richard Neptune, Matthew R. Ohline, Robert E. Smith, Nancy Squires


Consulting Associate Professors: J. Edward Carryer, Brent Constantz, Paul Mitiguy, Carol B. Muller, Sunil Puria

Consulting Assistant Professors: Michael Barry, Brendan J. Boyle, William Burnett, Sara Little Turnbull, Scott Yerby

Visiting Professors: Dick Desautel, Javier Jimenez, Darryl Thenlen

Visiting Assistant Professor: B. Gurumoorthy

Visiting Assistant Professor: Darryl Thenlen

The programs in the Department of Mechanical Engineering (ME) are designed to provide background for a wide variety of careers. The discipline is very broad, and is generally understood to emphasize an appropriate mix of applied mechanics, biomechanical engineering, computer simulations, design, and energy science and technology. Graduates at all degree levels have traditionally entered into energy industries, product manufacturing industries, transportation, government laboratories and agencies dealing with these problems, and a variety of academic positions.

Since mechanical engineering is a broad discipline, the undergraduate program can be a springboard for graduate study in business, law, medicine, political science, and other professions where a good understanding of technology is often important. Both undergraduate and graduate programs provide excellent technical background for work in biomechanical engineering, environmental pollution control, ocean engineering, transportation, and on other multidisciplinary problems that concern our society. Throughout the various programs, considerable emphasis is placed on developing systematic procedures for analysis, effective communication of one's work and ideas, practical and aesthetic aspects in design, and responsible use of technology. This can provide a student with an approach and a philosophy of great utility, irrespective of an ultimate career.

The department has five divisions: Biomechanical Engineering, Design, Flow Physics and Computation Division (jointly with the Department of Aeronautics and Astronautics), Mechanics and Computation, and Thermosciences. Each maintains its own labs, shops, and offices.

The Biomechanical Engineering (BME) Division has teaching and research activities which focus primarily on musculoskeletal biomechanics, neuromuscular biomechanics, cardiovascular biomechanics, and rehabilitation engineering. Research in other areas including hearing, ocean, plant, and vision biomechanics exist in collaboration with associated faculty in biology, engineering, and medicine. The Biomechanical Engineering Division has particularly strong research interactions with the Mechanics and Computation Division, the Design Division, and the departments of Functional Restoration, Radiology, and Surgery in the School of Medicine.

The Design Division emphasizes cognitive skill development for creative design. It is concerned with automatic control, computer-aided design, creativity, design aesthetics, design research, experimental stress analysis, fatigue and fracture mechanics, finite element analysis, human factors, kinematics, manufacturing systems, microcomputers in design, micro-electromechanical systems (MEMS), optimization, design for manufacturability, and robotics. The Design Division offers undergraduate and graduate programs in Product Design (jointly with the Department of Art and Art History). The division offers a master's program in Manufacturing Systems Engineering jointly with the Department of Management Science and Engineering, and the Graduate School of Business.

The Flow Physics and Computation Division (FPC) is a joint laboratory of the departments of Aeronautics and Astronautics, and Mechanical Engineering. FPC is contributing new theories, models and computational tools for accurate engineering design analysis and control of complex flows (including acoustics, chemical reactions, interactions with electromagnetic waves, plasmas, and other phenomena) of interest in aerodynamics, electronics cooling, environment engineering, materials processing, planetary entry, propulsion and power systems, and other areas. A significant emphasis of FPC research is on physical modeling and analysis of physical phenomena in engineering systems. FPC students and research staff are developing new methods and tools for generation, access, display, interpretation and post-processing of large databases resulting from numerical simulations of physical systems. Research in FPC ranges from advanced simulation of complex turbulent flows to active flow control. The FPC faculty teach graduate and undergraduate courses in acoustics, aerodynamics, computational fluid mechanics, computational mathematics, fluid mechanics, combustion, and thermodynamics and propulsion.

The Mechanics and Computational Division covers biomechanics, continuum mechanics, dynamics, experimental and computational mechanics, finite element analysis, fluid dynamics, fracture mechanics, micro mechanics, nanotechnology, and simulation based design. Qualified students can work as research project assistants, engaging in thesis research in working association with the faculty director and fellow students. Projects include analysis, synthesis, and control of systems; biomechanics; flow dynamics of liquids and gases; fracture and micro-mechanics, vibrations, and nonlinear dynamics; and original theoretical.
computational, and experimental investigations in the strength and deformability of elastic and inelastic elements of machines and structures.

The Thermosciences Division offers courses and specialized work in applied thermodynamics, combustion, energy systems, fluid mechanics, gas physics and chemistry, heat transfer, laser diagnostics, materials processing, plasma sciences, propulsion, and sensors.

**Mission Statement**—The goal of Stanford’s undergraduate program in Mechanical Engineering is to provide each student with a balance of intellectual and practical experiences, accumulation of knowledge, and self-discovery in order to prepare the graduate to address a variety of societal needs. The program prepares each student for entry-level work as a mechanical engineer, for graduate study in engineering, or for graduate study in another field where a broad and fundamental engineering background provides a desirable foundation. With solid grounding in the principles and practice of mechanical engineering, graduates are ready to engage in a lifetime of learning about and employing new concepts, technologies, and methodologies, whatever their ultimate career choice.

**FACILITIES**

The department divisions maintain modern laboratories that support undergraduate and graduate instruction and graduate research work.

The Structures and Composites Laboratory, a joint activity with the Department of Aeronautics and Astronautics, studies structures made of fiber-reinforced composite materials. Equipment for fabricating structural elements include autoclave, filament winder, and presses. X-ray, ultrasound, and an electron microscope are available for nondestructive testing. The lab also has environmental chambers, a high speed impactor, and mechanical testers. Lab projects include designing composite structures, developing novel manufacturing processes, and evaluating environmental effects on composites.

Experimental facilities are available through the interdepartmental Structures and Solid Mechanics Research Laboratory, which includes an electrohydraulic materials testing system, a vehicle crash simulator, and a shake table for earthquake engineering and related studies, together with highly sophisticated auxiliary instrumentation. Facilities to study the micromechanics of fracture areas are available in the Micromechanics/Fracture Laboratory, and include a computer controlled materials testing system, a long distance microscope, an atomic force microscope, and other instrumentation. Additional facilities for evaluation of materials are available through the Center for Materials Research, Center for Integrated Circuits, and the Ginzton Laboratory. Laboratories for biological experimentation are available through the School of Medicine. Individual accommodation is provided for the work of each research student.

Many Biomechanical Engineering Division activities and resources are associated with the Rehabilitation Research and Development Center of the Veterans Administration Palo Alto Health Care System. This major national research center has computational and prototyping facilities. In addition, the Rehabilitation Research and Development Center houses the Electrophysiology Laboratory, Experimental Mechanics Laboratory, Human Motor Control Laboratory, Rehabilitation Device Design Laboratory, and Skeletal Biomechanics Laboratory. These facilities support graduate course work as well as Ph.D. student research activities.

Computational and experimental work is also conducted in various facilities throughout the School of Engineering and the School of Medicine, particularly in the Advanced Biomaterials Testing Laboratory of the Department of Material Science and Engineering, the Orthopaedic Research Laboratory in the Department of Functional Restoration, and the Vascular Research Laboratory in the Department of Surgery. In collaboration with the School of Medicine, biologically and clinically oriented work is conducted in various facilities throughout the Stanford Medical Center and the Veterans Administration Palo Alto Health Care System.

The Design Division has facilities for lab work in experimental mechanics and experimental stress analysis. Additional facilities, including MTS electrohydraulic materials test systems, are available in the Solid Mechanics Research Laboratory. Design Division students also have access to Center for Integrated Systems (CIS) and Ginzton Lab microfabrication facilities.

The division also maintains the Product Realization Laboratory, a teaching facility offering students integrated experiences in market definition, product design, and prototype manufacturing. The PR Lab provides coaching, design and manufacturing tools, and networking opportunities to students interested in product development. The ME 310 Design Project Laboratory has facilities for CAD, assembly, and testing of original designs by master’s students in the engineering design program. A Smart Product Design Laboratory supports microprocessor application projects. The Center for Design Research (CDR) has an excellent facility for concurrent engineering research, development, and engineering curriculum creation and assessment. Resources include a network of high-performance workstations. For World Wide Web mediated concurrent engineering by virtual, non-colocated, design-development teams, see the CDR URL (http://cdr.stanford.edu). In addition, CDR has several industrial robots for student projects and research. These and several NC machines are part of the CDR Manufacturing Sciences Lab. The Manufacturing Modeling Laboratory (MML) addresses various models and methods that lead to competitive manufacturing. MML links design for manufacturing (dfm) research at the Department of Mechanical Engineering with supply chain management activities at the Department of Management Science and Engineering. The Rapid Prototyping Laboratory consists of seven processing stations including clearing, CNC milling, grit blasting, laser deposition, low temperature deposition, plasma deposition, and shot peening. Students gain experience by using ACIS and Pro Engineer on Hewlett Packard workstations for process software development. The Design Division also has a unique “Product Design Loft,” in which students in the joint program in Design develop graduate thesis projects.

Flow Physics and Computation Division has a 32 processor Origin 2000 super computer and an array of powerful workstations for graphics and advanced data analysis. FPC is strongly allied with the Center for Turbulence Research (CTR), a research consortium between Stanford and NASA, and the Center for Integrated Turbulence Simulations (CITS), which is supported by the Department of Energy (DOE) under its Accelerated Strategic Computing Initiative (ASCI). The Center for Turbulence Research has direct access to major national computing facilities located at the nearby NASA-Ames Research Center, including massively parallel super computers. The Center for Integrated Turbulence Simulations has access to DOE’s vast supercomputer resources. The intellectual atmosphere of the Flow Physics and Computation Division is greatly enhanced by the interactions among CTR’s and CITS’s staff of postdoctoral researchers and distinguished visiting scientists.

The Mechanics and Computation Division has a Computational Mechanics Laboratory that provides an integrated computational environment for research and research-related education in computational mechanics and scientific computing. The laboratory houses Silicon Graphics, Sun, and HP workstations and servers, including an 8-processor SGI Origin2000 and a 16-processor networked cluster of Intel-architectured workstations for parallel and distributed computing solution of computationally intensive problems. A wide spectrum of software is available on the laboratory machines, including major commercial packages for engineering analysis, parametric geometry and meshing, and computational mathematics. The laboratory supports basic research in computational mechanics as well as the development of related applications such as simulation-based design technology.

The Thermosciences Division has two major labs. The Heat Transfer and Turbulence Mechanics (HTTM) Laboratory concentrates on fundamental research aimed at understanding and improved prediction of turbulent flows and thermal and fluid sciences at the microscales. The High Temperature Gas-Dynamics Laboratory (HTGL) is engaged in research activities in combustion, laser-based diagnostics and sensors, plasma sciences, pollutant formation, and reactive and non-reactive gas dynamics. The experimental capability of the HTGL includes a central laboratory computer with dedicated minicomputers, diagnostic devices for combustion gases, a spray combustion facility, laboratory combustors including a coal combustion facility and supersonic combustion
facilities, several advanced laser systems, a variety of plasma facilities, a pulsed detonation facility, and four shock tubes and tunnels. The Thermosciences and Design Division share the Microscale Thermal and Mechanical Characterization laboratory (MTMC). MTMC is dedicated to the measurement of thermal and mechanical properties in thin-film systems, including microfabricated sensors and actuators and integrated circuits, and features a nanosecond scanning laser thermometry facility, a laser interferometer, a near-field optical microscope, and an atomic force microscope. The activities at MTMC are closely linked to those at the Heat Transfer Teaching Laboratory (HTTTL), where undergraduate and master’s students use high-resolution probe stations to study thermal phenomena in integrated circuits and thermally-actuated microvalves. HTTTL also provides macroscopic experiments in convection and radiative exchange.

Guidance and Control Laboratory, a joint activity with the Department of Aeronautics and Astronautics and the Department of Mechanical Engineering, specializes in construction of electromechanical systems and instrumentation, particularly where high precision is a factor. Work ranges from robotics for manufacturing to feedback control of fuel injection systems for automotive emission control. The faculty and staff work in close cooperation with both the Design and Thermosciences Divisions on device development projects of mutual interest.

Many computation facilities are available to department students. Three of the department’s labs are equipped with super-minicomputers. Numerous smaller minicomputers and microcomputers are used in the research and teaching laboratories. Library facilities at Stanford are outstanding. In addition to the general library, there are Engineering, Mathematics, Physics, and other department libraries of which engineering students make frequent use.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

Specializing in mechanical engineering (ME) during the undergraduate period may be done by following the curriculum outlined earlier under the “School of Engineering” section of this bulletin. The University’s basic requirements for the bachelor’s degree are discussed in the “Undergraduate Degrees” section of this bulletin. Courses taken for the departmental major (math; science; science, technology, and society; engineering fundamentals; and engineering depth) must be taken for a letter grade if the instructor offers the option.

A Product Design program is offered by the Design Division and leads to the B.S. Engineering (Product Design). An individually designed major in Biomechanical Engineering (B.S.E.: Biomechanical Engineering), offered by the Biomechanical Engineering Division, may be appropriate for some students preparing for medical school or graduate bioengineering studies.

Grade Requirements—To be recommended by the department for a B.S. in Mechanical Engineering, a student must achieve the minimum grade point average (GPA) set by the School of Engineering (2.0 in engineering fundamentals and engineering depth).

For information about an ME minor, see the “School of Engineering” section of this bulletin.

COTERMINAL B.S. /M.S. PROGRAM

Stanford undergraduates who wish to continue their studies for the Master of Science degree in the coterminal program should apply for entrance after the beginning of the eighth quarter of undergraduate work and before the end of the 11th quarter. The application must provide evidence of potential for strong academic performance as a graduate student. The application is evaluated and acted on by the graduate admissions committee of the department. Typically, a GPA of at least 3.25 in engineering, science, and math is expected. Applicants must have completed two of 111, 112, 113, 131A, 131B, 131C, and must take the Graduate Record Examination (GRE) before action is taken on the application. Product designers must have completed 116A to be considered, and are required to work at least one year before rejoining the program. Co-terminal information and forms can be obtained from the ME Student Services office.

GRADUATE PROGRAMS

ADMISSION AND FINANCIAL ASSISTANCE

To be eligible for admission to the department, a student must have a B.S. degree in engineering (the Ph.D. degree requires the completion of the M.S.), physics, or a comparable science program. Applications for all degree programs are accepted throughout the year, although applications for fellowship aid must be received by January 14. The department annually awards, on a competitive basis, a limited number of fellowships, teaching assistantships, and research assistantships to incoming graduate students. Research assistantships are used primarily for post-master’s degree students and are awarded by individual faculty research supervisors, not by the department. Preference for teaching assistantships is generally given to students who obtain the bachelor’s or master’s degree at Stanford.

Mechanical engineering is a varied profession, ranging from primarily aesthetic aspects of design to highly technical scientific research. Discipline areas of interest to mechanical engineers include biomechanics, energy conversion, fluid mechanics, materials, nuclear reactor engineering, propulsion, rigid and elastic body mechanics, systems engineering, scientific computing, and thermodynamics, to name a few. No mechanical engineer is expected to have a mastery of the entire spectrum.

Master’s degree programs are offered in Mechanical Engineering (M.S.: ME), Engineering (Manufacturing Systems Engineering, M.S.E.: MSE), Engineering (Biomechanical Engineering, M.S.E.: BME), Engineering (Product Design, M.S.E.: PD), and Engineering (M.S.E.).

The following sections list specific requirements for the master’s degrees listed above.

MASTER OF SCIENCE

The basic University requirements for the M.S. degree are discussed in the “Graduate Degrees” section of this bulletin.

The master’s program normally consists of three quarters of full-time course work. No thesis is required, although many students become involved in research projects during the master’s year, particularly to explore their interests in working for the Ph.D. degree. Students whose undergraduate backgrounds are entirely devoid of some of the major subject disciplines of engineering (for example, applied mechanics, applied thermodynamics, fluid mechanics, ordinary differential equations) may need to take some undergraduate courses to fill in obvious gaps and prepare themselves to take graduate courses in these areas. Such students may require more than three quarters to fulfill the master’s degree requirements, as the make-up courses may not be used for other than the unrestricted electives (see item '4' below) in the M.S. degree program. However, it is not the policy to require fulfillment of mechanical engineering B.S. degree requirements in order to obtain an M.S. degree; furthermore, students who have already fulfilled certain categories of the M.S. degree requirements as a result of undergraduate work may find they have sufficient time (see item ‘3’ below) to obtain the M.S. degree in the normal three quarters.

MECHANICAL ENGINEERING

The master’s degree program requires 45 units of course work taken as a graduate student. At least 36 of the units must be taken at Stanford; any units transferred from other universities (up to 9 are allowed) must be in graduate-level courses taken while registered as a graduate student and may not be applied toward fulfillment of item '2' below. No thesis is required. However, students who desire some research experience during the master’s year may participate in research through ME 290, 291, and 292.

The department’s requirements for the M.S. in Mechanical Engineering are:
1. Mathematical Competence in Two of the Following Areas: complex variables, linear algebra, modern algebra, numerical analysis, partial differential equations, statistics, or vector and tensor analysis, as
demonstrated by completion of two courses from Computer Science 137, 205, 237A,B,C; Mathematics 106, 109, 113, 131, 132; ME 200-208; Statistics 110, 161. Requirement: 6 units.

Students who completed comparable graduate-level courses as undergraduates and who can demonstrate their competence to instructors may be exempted from this requirement by their advisers and the ME Student Services office, and place the units in the approved elective category.

2. Eighteen units of graduate-level courses in ME consisting of:
   a) A Specialty in Mechanical Engineering: a set of graduate-level courses in mechanical engineering to provide depth in one area. These sets have been approved by the faculty as providing depth in specific areas as well as a significant component of applications of the material in the context of engineering synthesis. These courses are listed in the Mechanical Engineering Graduate Handbook.
   b) Breadth in Mechanical Engineering: at least two additional graduate-level courses outside the depth area to bring the total number to at least 18 ME units in courses numbered 207 and above, excluding 290-301 and math courses. Courses 200-206, 288-301, and 311 may not be counted in these categories.

3. Approved Electives: to bring the total number of units to 39: all these units must have adviser approval. Graduate engineering, math, and science courses are normally approved, and upper-level undergraduate courses may be approved if consistent with the student’s objectives. Of the 39 units, no more than 6 may come from ME 291 and 292, and no more than 3 may come from the other courses numbered 290-299 or other seminars. Students planning a Ph.D. degree should discuss with their adviser the desirability of taking 291 or 292 during the master’s year.

4. Unrestricted Electives: to bring the total number of units submitted for the M.S. degree to 45: students are encouraged to use these units outside of engineering, mathematics, or the sciences. Students should consult their advisers on course loads and on ways to use the unrestricted electives to make a manageable program.

5. Within the courses satisfying the requirements above, there must be at least one graduate-level course dealing with lab studies. Courses which satisfy this requirement are 207A,B, 217B, 218A, 224, 225A, 226B, 248, 254, 267, 282A, 282B, 303, 310A,B,C.

Candidates for the M.S. in Mechanical Engineering are expected to have the approval of the faculty, and a minimum grade point average (GPA) of 2.75 in the 45 units presented in fulfillment of degree requirements. All courses used to fulfill requirements 1, 2, 3, and 5 above must be graded (excluding seminars and courses for which a Satisfactory/No Credit grade is given to all students).

Students falling below a GPA of 2.5 at the end of 20 units may be disqualified from further registration. Students failing to meet the complete degree requirements at the end of 60 units of graduate registration are disqualified from further registration. Courses used to fulfill deficiencies arising from inadequate undergraduate preparation for mechanical engineering graduate work may not be applied to the 60 units required for graduate registration.

PRODUCT DESIGN

The focus of the Joint Program in Design is the intersection of technology with human needs and aspirations. This program is a joint offering of the Department of Mechanical Engineering and the Department of Art and Art History. The resulting two-year degree of MS in Engineering (Product Design) is considered a terminal degree for the practice of design.

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art &amp; Art History 160, 169/269, 268</td>
<td>6</td>
</tr>
<tr>
<td>Art &amp; Art History 360A,B,C Master’s Project*</td>
<td>6</td>
</tr>
<tr>
<td>ME 211A,B,C Master’s Project*</td>
<td>12</td>
</tr>
<tr>
<td>ME 212. Calibrating the Instrument</td>
<td>2</td>
</tr>
<tr>
<td>ME 303. Manufacturing and Design</td>
<td>4</td>
</tr>
<tr>
<td>ME 313. Ambidextrous Thinking</td>
<td>3</td>
</tr>
<tr>
<td>ME 31A.A,B.C. Advanced Product Design</td>
<td>12</td>
</tr>
<tr>
<td>Approved Electives*</td>
<td>9</td>
</tr>
</tbody>
</table>

Free Electives† |
Total | 60

* Taken jointly each quarter.
† These electives allow a student to pursue studies suited to personal needs. A list of pre-approved product design electives is outlined in the Mechanical Engineering Graduate Handbook.

Note: Students with Bachelor’s degrees held to the program design a 45-unit program with their adviser.

Admission requirements are the same as for the M.S.:ME described above, with the additional requirements of a minimum of one year’s experience after the bachelor’s degree, and a portfolio showing strong evidence of design ability and aesthetic skills and sensitivity.

Students with non-engineering undergraduate degrees in design, art, architecture, etc., may apply to the Department of Art and Art History for a similar graduate design program administered by that department and leading to an M.F.A. in Design. Students with non-engineering degrees who wish to earn the M.S. degree should consult with the program adviser.

MANUFACTURING SYSTEMS ENGINEERING

The M.S. in Engineering (Manufacturing Systems Engineering) addresses the need for engineers who combine management and design skills focused on manufacturing. There is a critical need for individuals who can deal directly with product design for manufacturability; design of manufacturing tools; financial, organizational, and strategic management issues; and elements of automation technology such as computer-aided design, computer-aided manufacturing robotics, and microprocessor control.

Manufacturing Systems Engineering (MSE) is offered jointly by two departments: Mechanical Engineering, and Management Science and Engineering. The program seeks high-quality students with strong educational backgrounds in engineering and provides a demanding curriculum strong in both hardware aspects and engineering management. Students must apply directly to the MSE program by submitting an application to the Department of Mechanical Engineering.

The hardware and engineering-design aspects of the program include:

| ME 207A,B. Integrated Design in Marketing and Manufacturing |
| ME 217A,B. Design for Manufacturability |
| ME 218A,B,C. Smart Product Design |
| ME 310A. Tools for Team-Based Design |
| ME 310B,C. Design Project Experience with Corporate Partners |
| ME 313. Ambidextrous Thinking |
| ME 319. Robotics and Vision Lab |

The engineering management subjects include:

| Manage. Sci. & Engr. 203. Organization Behavior and Management |
| Manage. Sci. & Engr. 225. Manufacturing Systems Design |
| Manage. Sci. & Engr. 261. Inventory Control and Production Systems |
| Manage. Sci. & Engr. 262. Supply Chain Management |
| Manage. Sci. & Engr. 266. Management of New Product Development |
| Manage. Sci. & Engr. 268. Manufacturing Strategy |
| Manage. Sci. & Engr. 269. Marketing for Technology-Based Companies |

Hardware and engineering design courses provide hands-on knowledge of these functions and the trade-offs that must be made to take advantage of the relationships between design and manufacturing. Engineering management subjects provide a suitable perspective for evaluating alternative financial, organizational, and production systems as well as a firm’s manufacturing policy.

Beyond the required core, the curriculum allows for choice from a broad set of relevant electives to provide additional training in engineering management and engineering design hardware. Here a student may tailor the program to meet individual interests and needs.

Students in the MSE program must have faculty approval and a minimum GPA of 3.0 in the 45 units presented in fulfillment of the degree requirements.

DUAL M.S.E. AND M.B.A. PROGRAM

Students interested in a career focused on manufacturing management and product development may apply for the dual Manufacturing Systems Engineering and Master of Business Administration Program. Minimum requirements can be met through seven quarters of study if the candidate
matriculates to both programs simultaneously. For additional information, contact the MSE Design Division Office.

BIOMECHANICAL ENGINEERING

Students interested in graduate studies in biomechanical engineering can choose one of the programs below.

1. **M.S. in Mechanical Engineering**: students who apply and are admitted to the M.S./ME program can elect to take biomechanical engineering courses as part of their M.S./ME requirements. These courses are usually applied towards the student's engineering breadth or technical electives.

2. **M.S. in Engineering: Biomechanical Engineering (M.S.E.:BME)**: this degree program allows students more flexibility in taking courses in the life sciences and generally emphasizes a more interdisciplinary curriculum. Minimum grade point average (GPA) requirements are the same as for the M.S. in Mechanical Engineering.

A Ph.D. in Biomechanical Engineering is not given. Students from either master's degree path (Mechanical Engineering or Biomechanical Engineering) receive their Ph.D. degrees in Mechanical Engineering. The Ph.D. qualifying examinations are flexible enough to accommodate students with either master's degree preparation.

ENGINEERING

As described in the “School of Engineering” section of this bulletin, each department in the school may sponsor students in a more general degree, the M.S. in Engineering. Sponsorship by the Department of Mechanical Engineering (ME) requires (1) filling a petition for admission to this program on the day before instruction begins, and (2) that the center of gravity of the proposed program lies in ME; no more than 18 units used for the proposed program can have been previously completed. The program must include at least 9 units of graduate-level work in the department other than ME 200-206 and 288, 290-297, 301, 311. The petition must be accompanied by a statement explaining the program objectives and how it is coherent, contains depth, and fulfills a well-defined career objective. The grade requirements are the same as for the M.S. in Mechanical Engineering.

POST-MASTER'S DEGREE PROGRAMS

The department offers two post-master's degrees: Engineer and Doctor of Philosophy. Post-master's research generally requires some evidence that a student has research potential before a faculty member agrees to supervision and a research assistantship. It is most efficient to carry out this preliminary research effort during the M.S. degree year.

ENGINEER

The basic University requirements for the degree of Engineer are discussed in the “Graduate Degrees” section of this bulletin. This degree represents an additional year of study beyond the M.S. degree and includes a research thesis. The program is designed for students who wish to do professional engineering work upon graduation and who want to engage in more specialized study than is afforded by the master's degree alone.

Admission standards are substantially the same as indicated under the master's degree. However, since thesis supervision is required and the availability of thesis supervisors is limited, admission is not granted until the student has personally engaged a faculty member to supervise a research project. This frequently involves a paid research assistantship awarded by individual faculty members (usually from the funds of sponsored research projects under their direction) and not by the department. Thus, personal arrangement is necessary. Students studying for the M.S. degree at Stanford and desiring to continue to the Engineer degree ordinarily make such arrangements during the M.S. degree year. Students holding master's degrees from other universities are invited to apply and may be admitted providing they are sufficiently well qualified and have made thesis supervision and financial aid arrangements.

Department requirements for the degree include an acceptable thesis; up to 18 units of credit are allowed for thesis work. In addition to the thesis, 27 units of approved advanced course work in mathematics, science, and engineering are expected beyond the requirements for the M.S. degree; the choice of courses is subject to approval of the adviser. Students who have not fulfilled the Stanford M.S. degree requirements are required to do so (with allowance for approximate equivalence of courses taken elsewhere).

Candidates for the degree must have faculty approval and have a minimum grade point average (GPA) of 3.0 for all courses (exclusive of thesis credit) taken beyond those required for the master's degree.

DOCTOR OF PHILOSOPHY

The basic University requirements for the Ph.D. degree are discussed in the “Graduate Degrees” section of this bulletin. The Ph.D. degree is intended primarily for students who desire a career in research, advanced development, or teaching; for this type of work, a broad background in math and the engineering sciences, together with intensive study and research experience in a specialized area, are the necessary requisites.

A Ph.D. degree is not given. Students from either master's degree path (Mechanical Engineering or Biomechanical Engineering) receive their Ph.D. degrees in Mechanical Engineering. The Ph.D. qualifying examinations are flexible enough to accommodate students with either master's degree preparation.

The basic University requirements for the degree of Engineer are discussed in the “Graduate Degrees” section of this bulletin. This degree represents an additional year of study beyond the M.S. degree and includes a research thesis. The program is designed for students who wish to do professional engineering work upon graduation and who want to engage in more specialized study than is afforded by the master's degree alone.

Admission standards are substantially the same as indicated under the master's degree. However, since thesis supervision is required and the availability of thesis supervisors is limited, admission is not granted until the student has personally engaged a faculty member to supervise a research project. This frequently involves a paid research assistantship awarded by individual faculty members (usually from the funds of sponsored research projects under their direction) and not by the department. Thus, personal arrangement is necessary. Students studying for the M.S. degree at Stanford and desiring to continue to the Engineer degree ordinarily make such arrangements during the M.S. degree year. Students holding master's degrees from other universities are invited to apply and may be admitted providing they are sufficiently well qualified and have made thesis supervision and financial aid arrangements.

Department requirements for the degree include an acceptable thesis; up to 18 units of credit are allowed for thesis work. In addition to the thesis, 27 units of approved advanced course work in mathematics, science, and engineering are expected beyond the requirements for the M.S. degree; the choice of courses is subject to approval of the adviser. Students who have not fulfilled the Stanford M.S. degree requirements are required to do so (with allowance for approximate equivalence of courses taken elsewhere).

Candidates for the degree must have faculty approval and have a minimum grade point average (GPA) of 3.0 for all courses (exclusive of thesis credit) taken beyond those required for the master's degree.
The Ph.D. thesis normally represents at least one full year of research work and must be a substantial contribution to knowledge. Students may register for course credit for thesis work (ME 301) to help fulfill University residence requirements, but there is no minimum limit on registered dissertation units. Candidates should note that University residence requirements (see the "Graduate Degrees" section of this bulletin) are expressed in terms of equivalent full-time registration and not in terms of units per se; questions on this should be addressed to the manager of Student Services.

The department has a breadth requirement for the Ph.D. degree. This may be satisfied either by a formal minor in another department or by course work that is approved by the dissertation reading committee.

The final University oral examination is conducted by a committee consisting of a chair from another department and four faculty members of the department or departments with related interests. Usually, the committee includes the candidate’s adviser and two faculty members chosen to read and sign the candidate’s dissertation. The examination consists of two parts. The first is open to the public and is scheduled as a seminar talk, usually for one of the regular meetings of a seminar series. The second is conducted in private and covers subjects closely related to the dissertation topic.

A student wishing to complete the Ph.D. requirements in four years should ordinarily complete the M.S. by the Spring Quarter of the first year, pass the qualifying examination by the Autumn Quarter of the second year and complete the course work, demonstrate feasibility of research methods, and obtain approval of the dissertation proposal by the end of the third year.

COMBINED PH.D./M.D. DEGREE PROGRAM

Students interested in a career oriented towards biomechanical research and clinical medicine can pursue the combined Ph.D./M.D. degree program.

The Ph.D. degree is administered by the Department of Mechanical Engineering of the School of Engineering. To be formally admitted as a Ph.D. degree candidate in this combined degree program, the student must apply through normal department channels and must have earned an M.S. in Mechanical Engineering, an M.S.E in Biomechanical Engineering, or a comparable master’s degree. Students must pass the Department of Mechanical Engineering Ph.D. qualifying examination and pursue a doctoral thesis in a biomechanical engineering area.

The M.D. degree is administered by the School of Medicine. Students must apply separately through regular channels for admission to the M.D. program and satisfactorily complete 204 units in courses and clerkships approved for credit toward the M.D. degree. Of these, 72 quarter units must be in clerkships. For further information on the M.D. program, consult the School of Medicine Catalog.

For students fulfilling the full M.D. requirements who earned their master’s level engineering degree at Stanford, the Department of Mechanical Engineering may waive its normal department requirement that the 36 units applied towards the Ph.D. degree (beyond the master’s degree level) be formal course work. Consistent with the University Ph.D. requirements, the department may instead accept 36 units consisting of courses, research, or seminars that are approved by the student’s Ph.D. thesis reading committee and the department chair. For further information, consult the manager of Student Services.

Ph.D. MINOR

Students who wish a Ph.D. minor in ME should consult the ME Student Services office. A minor in ME may be obtained by completing 20 units of approved graduate-level ME courses or by completing 9 units of graduate-level courses and passing the departmental qualifying oral examination in two appropriate areas identified by the minor adviser.

Courses approved for the minor must form a coherent program and must be selected from those satisfying requirement ‘2’ for the M.S. in Mechanical Engineering.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

PRIMARILY FOR UNDERGRADUATES

Note 1—The following are especially suitable for freshmen.

101. Visual Thinking

105. Manufacturing and Design

Note 2—Lab sections in experimental engineering are assigned in groups. If the lab schedule permits, students are allowed, with due regard to priority of application, to arrange own sections and lab periods. Enrollment with the instructor concerned, on the day before instruction begins or the first day of University instruction, is essential in order that the lab schedule may be prepared. Enrollment later than the first week is not permitted.

10. Introduction to Engineering Analysis—(Enroll in Engineering 10.)

30. Engineering Thermodynamics—(Enroll in Engineering 30.)


4 units, Win (Cappelli) Spr (Santiago)

38. The Design of Life—The design of a variety of living organisms is considered from a mechanical perspective.

3 units, Win (Carter)

70N. Stanford Introductory Seminar: The Aerodynamics of Sports Balls—Preference to freshmen. The aerodynamics of the ball play a major role in many sports, e.g., the curve and knuckle ball in baseball, the spiral of a correctly thrown football, the effect of top spin in tennis, and the effect of dimples on a golf ball. The complex aerodynamics can be understood by application of basic concepts and experimental techniques. Simple, intuitive application of the basic principles precede lab and/or field experiments to verify their intuition. Lab experiments involve flow visualization in a wind tunnel; field experiments may involve tests in throwing, hitting, or kicking various balls and interaction with local teams. Teams of two to three prepare a written report discussing the importance of aerodynamics in a particular sport.

3 units, Spr (Mungal)

71Q. Stanford Introductory Seminar: The Burning of Fossil Fuels, Global Warming, and the Environment—Preference to sophomores. Combustion has been humankind’s primary energy source. The role that combustion plays as a future energy source and the environmental and economic consequences of this. Issues: projections of energy utilization and energy sources into the future (and the associated uncertainties), the environmental effects of combustion (including air quality and global warming), strategies to reduce the environmental effects of combustion, and the role of regulations in driving combustion technology and the use of fossil fuels. Structured presentations, open discussion, directed readings. Outside speakers; visit to the campus combustion laboratory. Project with oral/written reports.

3 units (Bowman) not given 2000-01

72N. Stanford Introductory Seminar: The Jet Engine—Preference to freshmen. The basics of how a jet engine works and the technologies and
analytical techniques required to understand them. Brief coverage of
dynamics, thermodynamics, turbomachinery, combustion and pollution
formation, advanced materials, cooling technologies, and control sys-
tems. Field trips. Prerequisites: high school physics and an interest in
how mechanical things work.
3 units, Aut (Eaton)

73N. Stanford Introductory Seminar: Designing the Human Expe-
rience—An Exploration into the Theory and Practice of Design
Thinking—Preference to freshmen. Readings, discussion, and projects
explore the proposition that design education is for everyone.
3 units, Win (Leifer)

74N. Stanford Introductory Seminar: Stuff—Preference to freshmen.
The advancement of human society largely depends on the “stuff”
available for housing, transportation systems, industrial products, de-
defense systems, etc. Frequently, “human made stuff” gets exposed to
unfriendly environments such as high temperatures, corrosive liquids,
and gases. The most extreme conditions occurs in aircraft engines. A trip
to an airline maintenance facility provides insight to what environmental
conditions advanced turbine blades are required to suffer, and how
engineers prevent the premature “death” of turbine blades to avoid major
catastrophes.
3 units (Prinz) not given 2000-01

75N. Stanford Introductory Seminar: Mechanical Design Issues for
Sports Equipment—Preference to freshmen. Any sporting goods de-
partment reveals interesting examples of mechanical design, accompa-
nied by “literature” which highlights the novel design “features.” Design
features can be understood and are sensible, e.g., “perimeter weighting”
in golf clubs, or are less obvious, and perhaps of no real utility, e.g.,
“bubble shaft” in golf clubs or “fat head” in baseball bats. Analyses of
some designs, and conclusions about their relative merits.
3 units, Aut (Kenny)

76N. Stanford Introductory Seminar: Burn Baby Burn—The Sci-
ence of Flames—Preference to freshmen. The roles that chemistry and
fluid dynamics play in governing the behaviors of flames. Emphasis is on
factors that affect flame microstructure, external appearance, and on the
fundamental physical and chemical processes that cause flames and fires
to propagate. Topics: history, thermodynamics, and pollutant formation
in flames. Trips to labs where flames are studied. Prerequisites: high
school physics and an interest in thermochemical phenomena.
3 units, Spr (Mitchell)

99. Mechanical Dissection—Series of mechanical dissection labs to
resolve common questions of everyday products and provide confidence in
“hands-on” skills. Students choose a current product, track its history,
obtain samples (current and “antique”), disassemble, and explore func-
tions. Formal and informal presentations. Lab. Enrollment limited to 20.
Prerequisite: keen sense of curiosity.
3 units (Sheppard) not given 2000-01

100A.B. Mathematical and Computational Methods for Engineers—
(Enroll Engineering 155A.B.)

101. Visual Thinking—Lecture/lab. Visual thinking and language skills
are developed and exercised in the context of solving design problems.
Exercises for the mind's eye. Quickly executed diagrammatic, ortho-
graphic, perspective, and three-dimensional sketching with emphasis on
fluid and flexible idea production. The relation between visual
thinking and the creative process. Enrollment limited to 60.
3 units, Aut, Win, Spr (Staff)

102. Integration, Prototyping, Design, and Evaluation—The integra-
tion of human values, technology, and manufacturing towards engineering
solutions to design problems. Emphasis is on the development and
timely evaluation of potential candidates through the use of methodolo-
gy, computers, and rapid prototyping techniques. Lecture and lab.
Enrollment limited to 30.
3 units (Milroy) not given 2000-01

103. Manufacturing and Design—(Graduate students register for 303.)
Emphasis is on prototype development techniques as an intrinsic part of
the design process. The fundamentals of machining, welding, and
casting, introduced in lecture and supported by lab experience. Manufac-
turing processes through lecture, films, and field trips. Design aspects are
developed in an individual term project chosen, designed, and fabricated
by students. Limited enrollment with consent of instructor. Corequisite,
unless student has prior drafting experience: 103D. Corequisite for
Mechanical Engineering and Product Design undergraduate majors for
WIM: Engineering 102M. (WIM)
4 units, Aut, Win (Beach)

103D. Engineering Drawing and Design—The fundamentals of engi-
neering drawing including orthographic projection, dimensioning, sec-
tioning, exploded and auxiliary views, and assembly drawings. Designed
to accompany 103. Homework drawings are of parts fabricated by the
student in the shop. Major assignments in 103 are supported by material
in 103D and assignment dates are sequenced on the assumption that the
student is enrolled in both courses simultaneously.
1 unit, Aut, Win (Milroy)

104. Dynamic Behavior—(Enroll in Engineering 104.)

105. Feedback Control Design—(Enroll in Engineering 105.)

106. Vehicle Dynamics and Control—(Graduate students register for
227.) The application of the principles of dynamics, kinematics, and
control theory to the design and analysis of ground vehicle behavior.
Simplified models of ride, handling, and braking, their role in developing
intuition, and their limitations in engineering design. Suspension design
fundamentals. Multibody dynamics approaches to vehicle modeling.
Performance and safety enhancement through automatic control systems
such as anti-lock braking, active suspensions, and stability control.
Prerequisite: 161 or Engineering 104.
3 units, Spr (Gerdes)

106D. Vehicle Dynamics and Control Laboratory—(Graduate stu-
dents register for 227D.) Demonstration of handling fundamentals,
suspension set-up, and controller design using scale cars.
1 unit, Spr (Gerdes)

109. Computer Aided Design of Model Yachts—(Graduate stu-
dents register for 209.) Hands-on introduction to the art and science of
engineering and manufacturing. Students design and construct free
sailing model yachts to a high standard of craftsmanship using Computer
Aided Design and Manufacturing (CAD/CAM). Includes: sailing theory
(aerodynamics and hydrodynamics of sail boats); model yacht design
(nomenclature, scaling issues, lofting, history of rating rules, yacht
aesthetics, tradeoffs between speed and control); the use of design and
manufacturing systems (MaxSurf, Vellum, and laser-cuter); necessary
construction techniques (hull fixture, planking, fiberglassing, casting
ballast, sail making, finishing, and rigging); and sailing technique
(tuning for performance). Field trips. Enrollment limited to 33.
4 units (Fastie) alternate years, given 2001-02

110A. Design Sketching—Freehand sketching, rendering, and design
development. Work is guided by instructors. Concurrent assignments in
115 and 116B.C provide subject matter, but the class is open to anyone
wishing to improve freehand drawing skills. (AU)
1 unit, Win, Spr (Staff)

110B. Advanced Design Sketching—Freehand sketching, rendering,
design development, and some computer use. Work is guided by instruc-
111. Stress, Strain, and Strength—Review of the basic mechanics of materials and engineering properties of structural materials. Stress concentrations and their avoidance through design. Static failure theories for ductile and brittle materials. Introduction to friction mechanics. Review of surface failure mechanisms including corrosion, fretting, and wear. Structural failure by global and local buckling of columns and plates. Introduction to failure by fatigue; fatigue failure criteria and life prediction methods. Case studies in failure of structural components emphasizing applications to mechanical design.

3 units, Aut (Pinsky)

112. Mechanical Systems Design—Objectives: provide students familiarity with the function of basic machine elements (e.g., gears, bearings), the trade-offs between various classes of machine elements, performance characteristics of various machine elements, and systems level design; and to provide experience in working in teams, selecting machine classes in synthesis-type problems, iterative design including prototyping, communicating ideas in graphical, textual, and oral forms, and design critiquing. Lecturers, labs. Prerequisites: 101, 111. Recommended: 103, Engineering 15.

4 units, Win (Gerdes)

113. Mechanical Engineering Design—Objective: create designs and models of new mechanical devices. Design is studied as an activity and experienced by students as they work on a team design project obtained from industry and other sponsoring organizations. Prerequisites: 101, 103, 111, 112.

3 units, Spr (Staff)

114. Elements of Form—An exploration of proportion, rhythm, metaphor, scale, modularity, and other key concepts that enhance the designer's ability to generate appropriate form. Demonstrations, discussions, drawing, product examples, and modeling exercises develop the student's form vocabulary. Enrollment limited to 12. Prerequisites: 103, 115, and consent of instructor.

2 units, Spr (Fast)

115. Human Values in Design—Active encounters with human values in design. Lectures survey the central philosophy of the product design program, emphasizing the relation between technical and human values, the innovation process, and design methodology. Lab exercises include development of simple product concepts visualized in rapidly executed three-dimensional mockups. Prerequisite: 101.

3 units, Win (Kelley)

116A. Advanced Product Design: Formgiving—(Graduate students register for 316A.) Small- and medium-scale design projects are carried to a high degree of aesthetic refinement. Emphasis is on generating the appropriate forms to the task and setting. Prerequisites: 115, Art and Art History 160.

4 units, Aut (Staff)

116B. Advanced Product Design: Needfinding—(Graduate students register for 316B.) Exploration of human needs that leads to conceptualization of future products, environments, systems, and services. Field work in public and private settings; appraisal of personal values; readings on social ethnographic issues; and needfinding for a corporate client. Emphasis is on developing the flexible thinking skills that enable the designer to navigate the future. Prerequisite: 115, 116A, or consent of instructor.

4 units, Win (Faste)

116C. Advanced Product Design: Implementation—(Graduate students register for 316C.) Summary project utilizing the knowledge, methodology, and skills obtained in 115A,B, and 116A,B. Students implement design concept and present it to a professional jury. Prerequisite: 116.

4 units, Spr (Staff)

117. Introduction to Sensors—(Graduate students register for 220.) Sensors are widely used in scientific research and as an integral part of commercial products and automated systems. The basic principles for sensing displacement, force, pressure, acceleration, temperature, optical radiation, nuclear radiation, and other physical parameters. Performance, cost, and operating requirements of available sensors.Elementary electronic circuits which are typically used with sensors. Lecture demonstration of a representative sensor from each category elucidates operating principles and typical performance. Lab experiments with off-the-shelf devices.

3-4 units, Spr (Kenny)

118. Introduction to Mechatronics—(Graduate students register for 318.) Open to undergraduate and graduate students. Introduces the technologies involved in mechatronics (Intelligent Electro-Mechanical Systems) and the techniques necessary to apply this technology to mechatronic system design. Topics: electronics (A/D, D/A converters, op-amps, filters, power devices); software program design, event-driven programming; hardware and DC stepper motors, solenoids, and robust sensing. Lab component of structural assignments. Large and open-ended team project. Limited enrollment. Prerequisites: Engineering 40, Computer Science 106, or equivalent.

4 units, Win (Kenny, Ohline)

120. History and Philosophy of Design—Major schools of 19th- and 20th-century design (Arts-and-Crafts Movement, Bauhaus, Industrial Design, and post-modernism) are analyzed in terms of their continuing cultural relevance. The relation of design to art, technology, and politics; readings from principal theorists, practitioners, and critics; recent controversies in industrial and graphic design, architecture, and urbanism. Enrollment limited to 40.

4 units, Spr (Katz)

128. Design for Appropriate Technology—(Graduate students register for 328.) Lecture/lab. Design products for developing countries and markets with emphasis on culturally sensitive need determination; local material, process, and maintenance limitation; and information transfer. Weekly labs reinforce lecture topics. Team design projects explore solutions to real-world needs.

3 units, Spr (Staff)

128X. Design for Appropriate Technology Seminar—(Graduate students register for 328X.) Lecture. Design products for developing countries and markets with emphasis on culturally sensitive need determination; local material, process, and maintenance limitation; and information transfer.

1 unit, Spr (Staff)

130. Internal Combustion Engines—Internal combustion engines including conventional and turbocharged spark ignition, and diesel engines. Lectures: basic engine cycles, engine components, methods of analysis of engine performance, pollutant emissions, and methods of engine testing. Lab involves hands-on experience with engines and test hardware. Limited enrollment. Prerequisites: Engineering 30, 33, 131A (or concurrent enrollment in 131A), or equivalent.

3 units, Aut (Edwards)

131A. Heat Transfer—(Graduate students register for 250.) The principles of heat transfer by conduction, convection, and radiation are introduced with specific examples from the engineering of practical devices and systems. Topics: transient and steady conduction, conduction by extended surfaces, boundary layer theory for forced and natural convection, boiling, heat exchangers, and graybody radiative exchange.
Prerequisites: 33, Engineering 30. Recommended: intermediate calculus, ordinary differential equations.
4 units, Aut (Goodson)

131B. Fluid Mechanics: Compressible Flow and Turbomachinery—Introduction to engineering applications involving compressible flow: aircraft propulsion, rocket propulsion, power generation; application of mass, momentum, energy and entropy balance to compressible flows; variable area isentropic flow, normal shock waves, adiabatic flow with friction, flow with heat addition, Operation of flow systems: the propulsion system. Introduction to turbomachinery: pumps, compressors, turbines. Angular momentum analysis of turbomachine performance, centrifugal and axial flow machines, effect of blade geometry, dimensionless performance of turbomachines; hydraulic turbines; steam turbines; wind turbines. Compressible flow turbomachinery: the aircraft engine. Prerequisite: 131A.
3 units, Win (Squires)

134. Modern Experimentation—Practical introduction to modern techniques for data acquisition, experimental control, and statistical and time-domain analysis of sampled data. Introduction to and use of a range of measurement devices including traditional sensors and optically-based systems. Lab includes individual work in computerized data acquisition and experimental control including A/D and D/A conversion, digital interfacing, and software development using powerful graphical programming. Statistical concepts and sensor systems are introduced with simple experiments on small devices. Teams develop a fully integrated experiment to test and improve an interesting engineering system. Prerequisites: 33, 131A.
3 units, Win (Eaton)

140. Integrated Thermal Systems—Capstone course in thermal science, providing experience in thermal analysis and engineering, with emphasis on integrating heat transfer, fluid mechanics, and thermodynamics into a unified approach to treating complex systems. Lecture introduces mixtures, humidity, chemical and phase equilibrium, and availability. Labs apply principles through hands-on experience with a turbojet engine, a PEM fuel cell, and a hybrid solid/oxygen rocket motor. Analysis of systems is facilitated using MATLAB as a computational tool. Prerequisites: 131A, 131B, Engineering 30.
4 units, Spr (Edwards)

161. Dynamic Systems—Modeling, analysis, and measurement of mechanical and electromechanical systems. Numerical and closed form solutions of ordinary differential equations governing the behavior of single and multiple degree of freedom systems. Stability, resonance, amplification and attenuation, and control system design. Demonstrations and laboratory examples. Prerequisites: background in dynamics and calculus, e.g., Engineering 15 and Mathematics 43; and familiarity with differential equations, linear algebra, and basic electronics.
4 units, Aut (Mitiguy)

180. Skeletal Development and Evolution—(Graduate students register for 280.) The development, adaptation, repair, and aging of the vertebrate skeleton is considered from an evolutionary perspective. Emphasis is on the interacting influences of mechanobiology and molecular genetics.
3 units, Spr (Carter)

181. Biomechanics of Movement—(Graduate students register for 381.) Review of experimental techniques used to study human and animal movement, including motion capture systems, EMG, force plates, medical imaging, and animation. The mechanical properties of muscle and tendon, and quantitative analysis of musculoskeletal geometry. Projects and demonstrations emphasize applications of mechanics in sports, orthopaedics, neurology, and rehabilitation.
3 units, Aut (Delp)

182. Biomineralization—The process of formation and adaptation of mineralized structures formed by organisms, principally animal skeletons. Emphasis is on the interacting influences of phylogenetic history, material constraints, mechanical factors, and other ecological and physiological considerations. Skeletal formation processes and the skeletal microstructure and ultrastructure of every animal phylum. The evolutionary aspects of body plan design among the major animal phyla with skeletons.
2 units, Spr (Constants)

184A. Cardiovascular Biomechanics—(Graduate students register for 284A.) Biomechanical principles are developed and applied to the cardiovascular system. The relevance of mechanics in the study of cardiovascular function is examined from a historical perspective. Cardiovascular system anatomy, tissue mechanics, and blood rheology. Lumped parameter models, wave propagation models. Womersley theory, finite element methods of blood flow, pulsatile flow in deformable vessels, and cardiac fluid dynamics. Problems in modeling blood flow within the context of disease research, device design, and surgical planning.
3 units, Win (Taylor)

184B. Cardiovascular Biomechanics—Continuation of 184A.
3 units, Spr (Taylor)

191. Engineering Problems and Experimental Investigation—Directed study and research for undergraduates on a subject of mutual interest to student and staff member. Student must find faculty sponsor and have approval of the adviser.
1-5 units, any quarter (Staff)

194. Medical Device Design—(Graduate students register for 384.) Offered in collaboration with the School of Medicine. Introduction to medical device design for undergraduate and graduate engineering students. Significant design and prototyping. Labs expose students to medical device environments, including hands on device testing and field trips to operating rooms and local device companies. Limited enrollment. Prerequisite: 103/303.
3 units, Aut (Milroy)

1-3 units, Spr (Milroy)

UNDERGRADUATE AND GRADUATE

The following are especially suitable for advanced undergraduates and graduates and may be used to satisfy the M.S. requirement, item '3' above, approved electives.
103. Manufacturing and Design
105. Feedback Control Design—Enroll in Engineering 105
113. Engineering Design
161. Dynamic Systems
250. Heat Transfer

PRIMARILY FOR GRADUATES

ENGINEERING MATHEMATICS AND COMPUTATION

200A, B, C are intended for students in the master’s program with some proficiency in undergraduate engineering mathematics and computing. Students enrolling in this sequence should have had some exposure to elementary linear algebra (for example, elementary operations with matrices), ordinary differential equations (for example, Mathematics 130), and computer programming. Students who do not meet these guidelines should be prepared to devote additional remedial time to these courses or consider satisfying their requirements through Mathematics 113 and 131, and Computer Science 137.

200A. Mathematical and Computational Methods in Engineering—The theory of linear algebra; basis, linear independence, column space,
null space, rank. Emphasis is on computer solutions of the linear system of algebraic and differential equations. Roundoff errors, pivoting, and ill-conditioned matrices. Quadratic forms, norm and condition numbers, projection and least-squares, operation counts, eigenvalues, eigenvectors, and their computation. The canonical diagonal form, functions of a matrix. Unitary, Hermitian, and normal matrices. Principal stresses and axes. Recommended: familiarity with computer programming; Mathematics 103, 130, or equivalent.

3 units, Aut (Staff)

200B. Mathematical and Computational Methods in Engineering—Geometric interpretation of partial differential equations (PDEs), characteristics, solution of first-order equations, characteristics and classification of second-order PDEs, separation of variables, special functions, eigenfunction expansions, Fourier integrals and transforms, Laplace transforms, method of characteristics, analytic and numerical techniques, self-similarity. Prerequisite: 200A.
3 units, Win (Fierziger)

3 units, Spr (Moin)


206. Introduction to Symmetry Analysis—(Enroll in Aeronautics and Astronautics 218.)

DESIGN AND CONTROLS

207A,B. Integrated Design for Marketability and Manufacturing (IDMM)—Integrated market research, product design, prototype manufacture, pricing, and product management. New product launching, with emphasis on compressed development cycle time and cross functional staffing. Teams of MBAs and engineers compete for simulated sales and profitability. Innovative use of market research as a design tool, immersion in hands-on manufacturing process, product definition communication, and sales. Emphasis on process and material selection, design for productability, failure modes and effects analysis (FMEA), design for serviceability, environmental product design, and organization issues for simultaneous engineering. Enrollment limited to 40. No maximum enrollment for Stanford Instructional Television Network (SITN) students. Minimum enrollment of two per viewing site; single student site by prior consent of instructor. Prerequisite: 217A.
4 units, Aut, Win (Beach, Srinivasan)


211A,B,C. Product Design Master’s Thesis—For Product Design or Design (Art) majors only. Students create and present two masters’ theses under the supervision of engineering and art faculty. Theses involve the synthesis of aesthetics and technological concerns in the service of human need and possibility. Product Design students take for 4 units, Art students take for 2 units. Corequisite: Art and Art History 360.

211A. 2-4 units, Aut (Faste, Kelley)
211B. 2-4 units, Win (Faste, Kelley)
211C. 2-4 units, Spr (Faste, Kelley)

212. Calibrating the Instrument—Open to Product Design or Design (Art) majors. Calibrating the designer’s mind/body “instrument” in regards to aesthetic, kinesthetic, sensory, behavioral and experiential self-knowledge. Improvisation, educational kinesiology, Brain Gym, Zazen, and other methods are used to center and inform the designer. Shared stories and goal setting begin building community.
2 units, Aut (L. Faste, R. Faste)

3 units, Spr (Milroy)

214. Good Products and Bad Products—An analysis of characteristics of industrial products that can cause them to be successes or failures: the straight-forward (performance, economy, reliability), the complicated (human and cultural fit, compatibility with the environment, craftsmanship, positive emotional response of the user), the esoteric (elegance, sophistication, symbolism). Engineers and business people must better understand these factors to produce more successful products. Readings, lectures, projects, papers, guest speakers, and field trips. Enrollment limited.
3 units, Win (Adams, Beach)

215. The Designer in Society—Open to all graduate students. Participants’ career objectives and psychological orientation are compared with existing social values and conditions. Emphasis is on assisting individuals in assessing their roles in society. Readings on political, social, and humanistic thought are related to technology and design. Experiential, in-class exercises, and term project. Attendance mandatory. Enrollment limited to 24.
3 units, Win (Roth)

216. Introduction to Aircraft Design, Synthesis, and Analysis—(Enroll in Aeronautics and Astronautics 241A.)

217A. Design for Manufacturability: Product Definition—Systematic methodologies to define, develop, and produce competitive products. Methods cover the characterization of user values, design for manufacturability, and environmental compatibility. 217A addresses the key issues for product competitiveness. Student teams identify opportunities for improvement and develop a comprehensive product definition. Topics: design for value, functional analysis, quality function deployment, value engineering, design for assembly, product line structuring, process and material selection, design for productability, failure modes and effects analysis (FMEA), design for serviceability, environmental product design, and organization issues for simultaneous engineering. Enrollment limited to 40. No maximum enrollment for Stanford Instructional Television Network (SITN) students. Minimum enrollment of two per viewing site; single student site by prior consent of instructor.
4 units, Win (Ishii)

217B. Design for Manufacturability: Quality by Design—Building on the product definition process covered in 217A, focuses on the implementation of competitive product design. Student groups apply structured methods to optimize the design of an improved product, and plan for its manufacture, testing, and service. The project deliverable is a comprehensive product and process specification. Topics: concept generation and selection (Pugh’s Method), FMEA applied to manufacturing process, design for robustness, Taguchi Method, SPC and six sigma process, tolerance analysis, flexible manufacturing, product testing, rapid prototyping. Enrollment limited to 40, not including SITN students. Minimum enrollment of two per SITN viewing site; single student site by prior consent of instructor. Prerequisite: 217A.
4 units, Spr (Ishii)

217C. Manufacturing Systems Design—(Enroll in Management Science and Engineering 264.)
218A. Smart Product Design Fundamentals—Introduction. Lecture, lab, and design project based series on programmable electromechanical systems design. Topics: transistors as switches, basic digital and analog circuits, boolean algebra, combinatorial and sequential logic, operational amplifiers, comparators, software design, programming in FORTH and "C." Team project. Enrollment in 218B,C is contingent on completing 218A or passing a Smart Product Design Fundamentals proficiency examination given at the start of Autumn Quarter. Lab fee. Limited enrollment.

5 units, Aut (Carreyer)

218B. Smart Product Design Applications—Intermediate level in the series of programmable electromechanical systems design, introduced in the context of lab assignments and integrated into a team project. Topics: user I/O, timer systems, interrupts, signal conditioning, software design for embedded systems, sensors, actuators, noise, and power supplies. Team project. Lab fee. Limited enrollment. Prerequisite: completion of 218A or passing of the Smart Product Design Fundamentals proficiency examination.

5 units, Win (Carreyer)

218C. Smart Product Design Practice—Advanced level in the series of programmable electromechanical systems design. Topics: microprocessor communication, system design with multiple microprocessors, architecture and assembly language programming for the PIC microcontroller, design with programmable logic, understanding and controlling the embedded software tool chain, A/D and D/A techniques, electronic manufacturing technology. Lab fee. Limited enrollment. Team project. Prerequisite: completion of 218B.

5 units, Spr (Carreyer)

218D. Smart Product Design Projects—Industrially sponsored project course is the culmination of the Smart Product Design sequence. Student teams take on an industrial project that requires the application and extension of the knowledge gained in the prior three quarters, including prototyping of a final solution with hardware, software, and professional documentation and presentation. Lectures extend the students' knowledge of electronic and software design, and electronic manufacturing techniques. Topics: chip level design of microprocessor systems, real time operating systems, alternate microprocessor architectures, PCB layout and fabrication.

4 units, Aut (Carreyer)

219. Introduction to Robotics—(Enroll in Computer Science 223A.)

220. Introduction to Sensors—See 117.

221. Materials Selection in Design—(Enroll in Materials Science and Engineering 270.)

222. Kinematic Synthesis of Mechanisms—The rational design of linkages. Techniques are presented to determine linkage proportions to fulfill various design requirements using analytical, graphical, and computer based methods.

3 units, Win (Roth)

224. Precision Engineering—Advances in engineering are often enabled by more accurate control of manufacturing and measuring tolerances. Concepts and technology enable precision such that the ratio of overall dimensions to uncertainty of measurement is large relative to normal engineering practice. Typical application areas: non-spherical optics, computer information storage devices, and manufacturing metrology systems. Application experience is gained through the design and manufacture of a precision engineering project, emphasizing the principles of precision engineering. Lectures, structured labs, and field trips. Undergraduate prerequisite: consent of instructors.

4 units, Spr (Beach, DeBra)

225A. Control System Design and Simulation—(Enroll in Engineering 206.)

225B. Analysis and Control of Nonlinear Systems—(Enroll in Engineering 209A.)

226A. Modern Control Design I—(Enroll in Engineering 207A.)

226B. Modern Control Design II—(Enroll in Engineering 207B.)

227. Vehicle Dynamics and Control—See 106.

227D. Vehicle Dynamics and Control Laboratory—See 106D.

228. Introduction to Control Design Techniques—(Enroll in Engineering 205.)

MECHANICS OF SOLIDS


3 units, Spr (Cho)

230. Advanced Kinematics—Kinematics from mathematical viewpoints. Introduction to algebraic geometry of point, line, and plane elements. Emphasis is on basic theories which have potential application to mechanical linkages, computational geometry, and robotics.

3 units, Aui (Roth)


3 units, Aui (Heegaard)


3 units, Win (Heegaard)

232A. Introduction to Computational Mechanics I—Overview of modern computational methods for solving problems arising in the mechanics of solids and structures. Basic concepts of the finite element method (FEM) and boundary element method (BEM). Equations of linear solid mechanics including variational formulations. Elastic bars (elasticity in one-dimension), steady heat conduction (diffusion), and plane elasticity (plane stress and strain, axisymmetric elasticity). Students develop a finite element code in Matlab using the PDE Toolbox pre- and post-processor, solve problems, and visualize results at every stage. Introduction to simulation-based design methodologies.

3 units, Win (Pinsky)

232B. Introduction to Computational Mechanics II—Introduction to convergence analysis of the finite and boundary element method. Advanced element formulations: mixed finite element models for incompressible and constrained media. Variational treatment of constraints based on Lagrange multiplier and penalty methods; contact mechanics. Extension of the finite element and boundary element methods to time-dependent problems, including transient heat conduction and dynamic
analysis. Extension of Matlab finite element code for the time-dependent problems.
3 units, Spr (Pinsky)

3 units (Hughes) alternate years, not given 2001-02

234B. Finite Element Methods in Fluid Mechanics—Continuation of 234A.
3 units (Hughes) alternate years, not given 2001-02

234C. Finite Element Methods in Fluid Mechanics—Continuation of 234B.
3 units (Hughes) alternate years, not given 2001-02

3 units (Hughes) alternate years, given 2001-02

3 units (Hughes) alternate years, given 2001-02

3 units (Hughes) alternate years, given 2001-02

237. Free and Forc ed Motion of Structures—(Enroll in Aeronautics and Astronautics 244A.)

3 units, Aut (Cho)

3 units, Win (Cho)

3 units, Win (Gao)

3 units, Spr (Gao)

3 units (Gao)

241A. Theory of Plates—Analysis of stress, deformation in plates bent by transverse loads. Applications to circular, rectangular, other shapes. Vibrations, buckling. Prerequisite: 111 or Civil and Environmental Engineering 114.
3 units (Steele)

241B. Theory of Shells—Axisymmetric deformation of shells of revolution. Asymptotic expansions, direct and bending stress. Application to design of domes, pressure vessels, expansion joints and pressure sensing devices. Use of asymptotic solutions for "very large finite element computation." Prerequisite: 111 or Civil and Environmental Engineering 114.
3 units (Steele)

3 units, Spr (Steele)

243. Micromechanics—(Enroll in Materials Science and Engineering 350.)

244. Atomistic Simulations of Materials—Fundamental concepts and practical techniques of atomistic simulations. Fundamental concepts of molecular dynamics (MD) and Monte Carlo (MC) simulations are introduced based on the finite difference method. Practical computational techniques of MD and MC simulations. The strength and weakness of atomistic simulations under the light of the accuracy of interatomic potentials. Standard methods of simulation analysis in connection with numerical data analysis and statistical mechanics. Advanced simulation techniques (generalized MD, smart MC simulations, accelerated dynamics, and multiscale analysis).
3 units (Cho) not given 2000-01

3 units, Win (Nelson)

246. Techniques of Failure Analysis—Enroll in Aeronautics and Astronautics 252.

247A. Microstructure and Mechanical Properties—(Enroll in Materials Science and Engineering 251.)

248. Experimental Stress Analysis—Theory and applications of photoelasticity, strain gages, and holographic interferometry. Comparison of test results with theoretical predictions of stress and strain. Discussion of other methods of stress and strain determination (optical fiber sensors, acoustoelasticity, thermoelasticity, brittle coating, Moiré). Student project on use of strain gages. Lab fee.

3 units, Spr (Nelson)

249A. Quantum Simulations of Molecules and Materials—(Enroll in Chemical Engineering 444A.)


3 units (Cho) not given 2000-01

HEAT TRANSFER, FLUID MECHANICS, AND HIGH TEMPERATURE GAS DYNAMICS

250. Heat Transfer—For graduate students; see 131A.

3 units, Aut

251A. Fluid Mechanics—Exact and approximate analysis of fluid flow covering kinematics, global and differential equations of mass, momentum, and energy conversation. Forces and stresses in fluids. Euler’s equations and the Bernoulli theorem applied to inviscid flows. Vorticity dynamics. Topics in irrotational flow: stream function and velocity potential for exact and approximate solutions; superposition of solutions; complex potential function; circulation and lift. Some boundary layer concepts.

3 units, Aut (Lele)

251B. Fluid Mechanics—Laminar viscous fluid flow. Brief review of governing equations, boundary conditions, and constitutive laws. Exact solutions for parallel flows. Creeping flow limit, lubrication theory, and boundary layer theory including free-shear layers and approximate methods of solution; boundary layer separation. Introduction to stability theory and transition to turbulence. Prerequisite: 251A.

3 units, Win (Lele)

252A. Radiative Heat Transfer—The fundamentals of thermal radiation heat transfer; blackbody radiation laws; radiative properties of non-black surfaces; analysis of radiative exchange between surfaces and in enclosures; combined radiation, conduction, and convection; radiative transfer in absorbing, emitting, and scattering media. Advanced material for students with interests in heat transfer, as applied in high-temperature energy conversion systems. Take 252B,C for depth in heat transfer. Prerequisites: graduate standing and undergraduate course in heat transfer. Recommended: computer skills.

3 units, Aut (Mitchell)


3 units, Win (Goodson)


3 units, Spr (Eaton)

254. Computers and Instrumentation in the Fluid Mechanics Laboratory—Experimental methods associated with the interfacing of laboratory instruments, experimental control, sampling strategies, data analysis, and introductory image processing. Instrumentation including point-wise anemometers and particle image tracking systems. Lab. Prerequisites: previous experience with computer programming and consent of instructor.

3 or 4 units, Win (Santiago)

255. Compressible Flow—Recommended for students with little experience in compressible flow. Introduction to compressible flow. Sound waves and normal shock-waves. Quasi-one-dimensional steady flows in variable area ducts with friction, heating, and cooling; unsteady one-dimensional flow, two-dimensional supersonic flow; oblique shock waves, Prandtl-Meyer expansions, detonation waves, method of characteristics.

3 units, Win (Bowman)

256. Turbomachinery, Fluid Dynamics, and Design—Theory, performance, and design of turbomachines (turbines, pumps, compressors, wind turbines, etc.). Turbomachines function as the result of the dynamic interaction of a moving fluid with a bladed rotor. Problems sets, and a final design problem such as the specification of blading for a compressor or a turbine stage to meet prescribed performance criteria. Prerequisites: 251A or equivalent, plus one-dimensional flow of a perfect gas as presented in 131B or equivalent.

3 units, Staff not given 2000-01

257. Fluid Flow in Microdevices—Introduction to the effects of physico-chemical forces on the fluid flow of micron-scale flow devices. Basic descriptions of creeping flow, charge double-layers, and electrochemical transport (e.g., Nernst-Planck equations) lead to a study of the hydrodynamics of solutions of charged and uncharged particles. Device applications of interest include microsystems that perform capillary electrophoresis, drug dispersion, and hybridization assays. Emphasis is on bioanalytical applications where electrophoresis, electro-osmosis, and Brownian motion effects are important. Prerequisite: consent of instructor.

3 units, Aut (Santiago)

258. Heat Transfer in Microdevices—Application-driven introduction to the thermal design of electronic circuits, sensors, and actuators that
have dimensions comparable to or smaller than one micrometer. The impact of thin-layer boundaries on thermal conduction and radiation. Convection in microchannels and microscopic heat pipes. Thermal property measurements for microdevices. Emphasis is on Si and GaAs semiconductor devices and layers of unusual, technically-promising materials, e.g., chemical-vapor-deposited (CVD) diamond. Final project can be based on student research interests. Prerequisite: consent of instructor.

3 units, Spr (Goodson)

259A. Numerical Methods in Fluid Mechanics—(Enroll in Aeronautics and Astronautics 214A.)

259B. Numerical Computation of Compressible Flow—(Enroll in Aeronautics and Astronautics 214B.)

259C. Numerical Computation of Viscous Flow—(Enroll in Aeronautics and Astronautics 214C.)

261A. Statistical Theory and Modeling for Turbulent Flow—Averaging and correlations, vorticity and vortex stretching, and the energy cascade. Reynolds stresses; introduction to transport equations. Length scales and spectra; "universal" scaling of small eddies. Law of the wall, local equilibrium, and eddy viscosity. Properties of boundary layers and other "thin" shear layers; complex flows. Introduction to prediction methods; local equilibrium, stress-transport, and eddy-viscosity transport models. Prerequisite: 251B.

3 units, Win (Staff)

261B. Advanced Topics in Turbulence—Topics vary each year and may include: spectral representation, rapid distortion theory, Cayley-Hamilton theorem and constitutive modeling of turbulence, turbulent dispersion, stochastic differential equations, Reynolds average and modeling for reacting flows, vortical structures (topology), intermittancy, proper orthogonal characteristic eddy decomposition, chaos, Lyapunov exponents, fractals, large eddy simulations, subgrid closure, and geophysical turbulence.

3 units, Spr (Staff)

262A. Physical Gas Dynamics—Concepts and techniques for description of high-temperature and chemically reacting gases from a molecular point of view. Introductory kinetic theory, chemical thermodynamics, and statistical mechanics as applied to properties of gases and gas mixtures. Transport and thermodynamic properties, law of mass action, and equilibrium chemical composition. Maxwellian and Boltzmann distributions of velocity and molecular energy. Examples and applications from areas of current interest, e.g., combustion and materials processing.

3 units, Aut (Cappelli)

262B. Nonequilibrium Processes in High-Temperature Gases—Introduction to chemical kinetics and energy transfer in high-temperature gases. Collision theory, transition state theory, and unimolecular reaction theory. Prerequisite: 262A.

3 units, Win (Golden)

263. Partially Ionized Plasmas and Gas Discharges—Introduction to partially ionized gases and the nature of gas discharges. Topics: the fundamentals of plasma physics emphasizing collisional and radiative processes, electron and ion transport, ohmic dissipation, oscillations and waves, interaction of electromagnetic waves with plasmas. Applications: plasma diagnostics, plasma propulsion and materials processing. Prerequisite: 262A or consent of instructor.

3 units, Spr (Cappelli)

264. Optical Diagnostics and Spectroscopy—Introduction to the spectroscopy of gases and laser-based diagnostic techniques for measurements of species concentrations, temperature, density, and other flow field properties. Topics: electronic, vibrational, and rotational transitions; spectral lineshapes and broadening mechanisms; absorption, fluorescence, Rayleigh and Raman scattering methods; collisional quenching. Prerequisite: 262A or equivalent.

3 units (Hanson) not given 2000-01


4 units, Spr (Hanson)

269A. Computational Methods in Fluid Mechanics—Advanced methods for solving systems of linear equations; multigrid and conjugate gradient methods; methods for potential flow; integral methods for boundary layers and their coupling to potential flow solutions; methods for the boundary layer equations; methods for solving the incompressible flow equations on structured grids: projection, fractional step and artificial compressibility methods. Students use and modify provided codes. Prerequisites: 200C, 251B or equivalents.

3 units, Aut (Ferziger)

269B. Computational Methods in Fluid Mechanics—Review of turbulence modeling; solution of the incompressible flow equations with turbulence models; methods for convective heat and mass transfer; methods for reacting flows, finite volume methods for structured and unstructured grids; direct numerical; simulation; large eddy simulation including subgrid scale models and numerical methods; methods for two phase flows; applications to compressible flow. Project involving solution of a problem of the student’s choosing. Prerequisite: 269A.

3 units, Win (Staff)

THERMODYNAMICS AND ENERGY CONVERSION

270. Engineering Thermodynamics—Thermodynamic analysis of engineering systems, emphasizing systematic methodology for application of basic principles. Introduction to availability analysis. Thermodynamics of gas mixtures and reacting systems. Modern computational equations of state. Thermodynamics of condensed phases, including solutions. Prerequisites: undergraduate background in engineering thermodynamics and computer skills.

3 units, Aut (Bowman)

271. Combustion Fundamentals—Heat of reaction, adiabatic flame temperature, and chemical composition of products of combustion; kinetics of combustion and pollutant formation reactions; conservation equations for multi-component reacting flows; propagation of laminar premixed flames and detonations. Prerequisite: 262A or 270, or consent of instructor.

3 units, Win (Mitchell)

272. Combustion Applications—The role of chemical and physical processes in combustion; ignition, flammability, and quenching of combustible gas mixtures; premixed turbulent flames; laminar and turbulent diffusion flames; combustion of fuel droplets and sprays. Prerequisite: 271.

3 units, Spr (Bowman)

BIOMECHANICAL ENGINEERING


281. Orthopaedic/Cardiovascular Bioengineering and Medicine—Engineering approaches are applied to the musculoskeletal and cardiovascular system within the context of surgical and medical care. Introduction to fundamental anatomy and physiology. The material and structural characteristics of hard and soft connective tissues and organ systems, and the role of mechanics in normal development and pathogen-
282A. Biomedical Device Design and Evaluation I—Introduction to the problems and challenges of biomedical device design and evaluation. Students engage in industry sponsored projects resulting in new designs, physical prototypes, design analyses, computational models, and experimental tests, gaining experience in: the formation of design teams; interdisciplinary communication skills; regulatory issues; biological, anatomical, and physiological considerations; testing standards for medical devices; and intellectual property. Attendance at grand rounds in clinical departments.

4 units, Win (Delp, Andriacchi)

282B. Biomedical Device Design and Evaluation II—Continued industry sponsored projects from 282A. With the assistance of faculty and expert consultants, students finalize product designs or complete detailed design evaluations of new medical products. Attendance at grand rounds in clinical departments. Strategies for funding new medical ventures.

4 units, Spr (Andriacchi)

283. Computational Locomotion Biomechanics—Review of the computational methods used to model and simulate the mechanics of human locomotion. Multibody dynamics, inverse dynamics, simple models of locomotion, torque actuation and energy flow. Joint kinematics and biomechanics, models of articular contact. Optimal control of musculo-tendon units, simulation of locomotion tasks including human gait and athletic performance. Prerequisite: 231, 381, or equivalent.

3 units (Heegaard, Delp) alternate years, given 2001-02

284A. Cardiovascular Biomechanics—See 184A.

284B. Cardiovascular Biomechanics—See 184B.

285. Tissue Engineering—Tissue engineering is an expanding discipline that applies biological and engineering principles to create substitutes or replacements for defective tissues or organs. The principles of cell biology provide a foundation for using engineering approaches to generate tissue structure and function. Emphasis is on how scaffolds, smart polymers, and mechanical forces can be used to reproduce the physical environment that acts, at the whole organ system level, to maintain specialized cellular function through molecular and genetic mechanisms.

2 units, Win (Smith)

286. Neuromuscular Biomechanics—The interplay between mechanics and neural control of movement. State of the art assessment through a review of classic and recent journal articles. Emphasis is on the application of dynamics and control to the design of assistive technology for persons with movement disorders.

3 units, Spr (Delp)

287. Biomechanics and Ecological Physiology of Intertidal Communities—(Enroll in Biological Sciences 277H.)

290. Thermosciences Research Project Seminar—Review of work in a particular research program and presentations of other related work. (AU)

1 unit, Aut, Win, Spr (Staff)

291. Engineering Problems—Directed study for graduate engineering students on subjects of mutual interest to student and staff member. May be used to prepare for experimental research during a later quarter under 292. Students must find a faculty sponsor.

1-5 units, any quarter (Staff)

291X. Teaching Participation—Credit is given for assisting a professor in the teaching of a mechanical engineering course. Prerequisite: consent of supervising instructor.

1-3 units, Aut, Win, Spr (Staff)

292. Experimental Investigation of Engineering Problems—Graduate engineering students undertake experimental investigation under guidance of staff member. Previous work under 291 may be required to provide background for experimental program. Faculty sponsor required.

1-5 units, any quarter (Staff)

293. Interdisciplinary Interaction Design—(Same as Computer Science 447.) Small teams develop innovative technology prototypes that combine product and interaction design. Focus is on software and hardware interfaces, interaction, design aesthetics, and some underpinnings of successful design: a reflective, interactive design process, group dynamics of effective interdisciplinary teamwork, and working with users. Prerequisite: 247A.

3-4 units, Spr (Kelley, Winograd)

293X. Human-Computer Interaction: Interaction Design Studio—(Enroll in Computer Science 247A.)

294. Design Forum—Invited speakers address issues of interest to designers. Brief presentation followed by open discussion. Spring Quarter emphasis on manufacturing and design.

1 unit, Aut (Gerdes)

Spr (Milroy)

295. Seminar in Solid Mechanics—Problems in all branches of solid mechanics. All Ph.D. candidates in solid mechanics are normally expected to attend.

1 unit, Aut, Win, Spr (Staff)

296. Manufacturing Systems Engineering Forum—Invited speakers address issues of interest to design and manufacturing engineers. Brief presentations are followed by open discussion. Sponsored by Stanford Engineering Club for Automation and Manufacturing. (SECAM) (AU)

1 unit, Aut, Win, Spr (Beach)

297. Design Theory and Methodology Forum—A mixture of research reports, literature reviews, and designer interviews promote rigorous examinations of the cognitive basis for designer behavior and design tool development.

1 unit, Aut, Win, Spr (Leifer, Mabogunje)

298. Seminar in Fluid Mechanics—(Enroll in Engineering 298.)

299. Practical Training—Educational opportunities in high-technology research and development labs in industry. Qualified graduate students engage in internship work and integrate that work into their academic program. Following internship, work students complete a research report outlining their work activity, problems investigated, key results, and any follow-on projects they expect to perform. Meets the requirements for Curricular Practical Training for Students on F-1 visas.
Student is responsible for arranging own employment. Register under adviser’s section number.

1 unit (Staff)

2-15 units, any quarter (Staff)

301. Thesis—Dissertation for the degree of Ph.D.
2-15 units, any quarter (Staff)

303. Manufacturing and Design—(Same as 103.)

ADVANCED MATHEMATICS AND COMPUTATION ANALYSIS

3 units (Durbin) not given 2000-01

3 units (Moin) not given 2000-01

DESIGN

309. Finite Element Analysis in Mechanical Design—Part I: basic concepts of finite elements, with applications to problems confronted by mechanical designers. Linear static, modal, and thermal formulations are emphasized; nonlinear and dynamic formulations are introduced. Students implement simple element formulations to obtain a deeper understanding of the essential features of this numerical technique. Part II: application of a commercial finite element code in analyzing design problems. Issues: solution methods, modeling techniques features of various commercial codes, basic problem definition. Individual projects focus on the interplay of analysis and testing in product design/development. Prerequisite: ability to program, Mathematics 103, or equivalent. Recommended: 111, or equivalent in structural and/or solid mechanics; some exposure to principles of heat transfer.
3 units (Sheppard) not given 2000-01

310A. Tools for Team-Based Design—(Same as Engineering 310A.)
For graduate students; open to limited SITN/global enrollment. Project-based, exposing students to the tools and methodologies useful for forming and managing an effective engineering design team in a business environment, including product development teams that may be spread around the world. Topics: personality profiles for creating teams with balanced diversity; computational tools for project coordination and management; real time electronic documentation as a critical design process variable; and methods for refining project requirements to ensure that the team addresses the right problem with the right solution. Computer-aided tools are employed for supporting geographically distributed teams. The final project analyzes a set of industry-sponsored design projects for consideration in 310B,C. The investigation includes benchmarking and meetings with industrial clients. The deliverable is a detailed document with specifications for the project and the optimal design team that should work on the project in subsequent quarters.
Limited enrollment, consent of instructor for off-campus (global) registrants.
4 units, Aut (Cutkosky)

310B.C. Design Project Experience with Corporate Partners—(Same as Engineering 310B,C.) Two-quarter project for graduate students who already have some design experience and want in-depth involvement in an entrepreneurial design team with real world industrial partners. The products developed are part of the student’s portfolio. For some projects, 217 and 218 may be prerequisites or co-requisites (see http://me310.stanford.edu for admission guidelines). Each team functions like a small start-up company, working closely with a technical advisory board, consisting of the instructional staff and a coach. Teams use computer-aided tools for project management, communication, and documentation, and are provided a budget for direct expenses including hiring technical assistants and conducting tests. Teams interact with corporate liaisons weekly via site visits, video conferencing, email, fax, and phone. Hardware demonstrations, peer reviews, scheduled documentation releases, and an intense team environment provide the mechanisms and culture for design information sharing. Enrollment by consent of instructor and depends on the results of a pre-enrollment survey in December and the recommendations made by project definition teams in 310A.
4-5 units, Win, Spr (Cutkosky)

311. Engineering: Women's Perspective—Master's and Ph.D.-level seminar series driven by student interests. Possible topics: time management, career choices, health and family, diversity, professional development, and personal values. Graduate students share experiences and examine scientific research in these areas. Guests speakers from academia and industry, student presentations with an emphasis on group discussion. (AU)
1 unit, Win (Sheppard)

313A. Ambidextrous Thinking—Visual and kinesthetic skills are developed and exercised in solving design problems. Quickly executed perspective, orthographic, diagrammatic, and three-dimensional sketches are emphasized in conjunction with fluent and flexible idea production. Exercises to appreciate and develop the entire body's role in creative thinking. Enrollment limited to 60.
3 units, Aut (Paster)

314. Solid State Physics for Mechanical Engineering—Introductory overview of the principles of statistical mechanics, quantum mechanics, and solid-state physics. Provides graduate mechanical engineering students with the understanding needed to work on devices or technologies which rely on solid-state physics.
3 units (Kenny) alternate years, given 2001-02

316A. Advanced Product Design: Formgiving—See 116A. Prerequisites: 313, 303; art.
4 units, Win (Burnett)

316B. Advanced Product Design: Needfinding—See 116B. Prerequisite: consent of instructor.
4 units, Win

316C. Advanced Product Design: Implementation—Prerequisite: 316B.
4 units, Spr

317. Total Product Integration Engineering—Targets students aspiring to be product development executives and leaders in dFM research and education. Students learn advanced methods and tools beyond the material covered in 217: quality design across global supply chain, robust product architecture for market variety and technology advances, product development risk management, etc. Small teams or individuals conduct a practical project that produces either an in-depth case study
using advanced tools or a significant enhancement to the dfM methods and tools. Enrollment limited to 16. Prerequisites: 217A,B. 3 units, Aut (Ishii)

318. Introduction to Mechatronics—See 118.

319. Robotics and Vision Lab—For graduate students with some familiarity in robotics who want project experience with robotic and vision systems. Current topics in robotics and machine vision with applications to flexible, automated manufacturing; emphasis is on integrated problems and techniques for fine motion control, calibration, acquisition of sensory data, and programming. Cell level topics: architectures and strategies for cell control. Research issues: dexterous manipulation and languages for high-level task specification. Typical projects: robotic deburring, assembly using force feedback and/or vision, part inspection, and cell control. Short assignments provide practice with various equipment. Enrollment limited to 30. Prerequisites: 219 or equivalent, some familiarity with programming.
3 units (Staff) not given 2000-01

327B. Introduction to Computer Vision—(Enroll in Computer Science 223B.)

328. Design for Appropriate Technology—See 128.

ADVANCED MECHANICS OF SOLIDS

349. Engineering Quantum Mechanics—Basic quantum mechanics topics necessary for engineering graduate students to understand the atomic, electronic, magnetic, and optical properties of diverse material systems and the fundamental underlying principles of microscopic measurement processes (e.g., STM, MFM, TEM, SNOM, etc.). Topics: electronic bound states, collision theory, symmetry in quantum mechanics, approximation methods, identical particles and spin, electromagnetic field, and relativistic wave equations.
3 units, Sum (Cho)

ADVANCED FLUID MECHANICS

351A. Advanced Fluid Mechanics—For advanced students specializing in fluid mechanics. Topics: kinematics (analysis of deformation, critical points and flow topology, Helmholtz decomposition); constitutive relations (viscous and visco-elastic flows, non-inertial frames); vortex dynamics; circulation theorems, vortex line stretching and rotation, vorticity generation mechanisms, vortex filaments and Biot-Savart formula, local induction approximation, impulse and kinetic energy of vortex systems, vorticity in rotating frame. Prerequisite: graduate-level courses in compressible and viscous flow.
3 units (Staff) not given 2000-01

351B. Advanced Fluid Mechanics—Waves in fluids: surface waves, internal waves, inertial and acoustic waves, dispersion and group velocity, wave trains, transport due to waves, propagation in slowly varying medium, wave steepening, solitons and solitary waves, shock waves. Stability of fluid motion: dynamical systems, bifurcations, Kelvin-Helmholtz instability, Rayleigh-Benard convection, energy method, global stability, linear stability of parallel flows, necessary and sufficient conditions for stability, viscosity as a destabilizing factor. Focus is on flow instabilities. Prerequisites: graduate-level courses in compressible and viscous flow.
3 units (Staff) not given 2000-01

3 units (Staff) not given 2000-01

3 units (Edwards) not given 2000-01

OTHER

381. Biomechanics of Movement—See 181.

382. Modeling and Simulation of Human Movement—Direct experience with the computational tools used to create simulations of human movement. Lecture/labs on animation of movement; kinematic models of joints; forward dynamic simulation; computational models of muscles, tendons, and ligaments; creation of models from medical images; control of dynamic simulations; collision detection and contact models. Prerequisite: 231, 381, or equivalent.
3 units, Spr (Delp, Heegaard) alternate years, not given 2001-02

384. Medical Device Design—See 194.


396. Product Realization Lab: Special Project—Material varies each year, emphasizing design and technique in either foundry work, machining projects, or wood construction.
1 unit, Spr (Milroy)

459. Frontiers in Interdisciplinary Biosciences—Introduction to cutting-edge research involving interdisciplinary approaches to biotechnology; for specialists and non-specialists. Associated with Stanford’s Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry and physics.
2 units, Aut, Win, Spr (S. Block)

SCIENTIFIC COMPUTING AND COMPUTATIONAL MATHEMATICS PROGRAM

Director: Gene H. Golub
Associate Director: Walter Murray
Core Faculty: Juan Alonso (Aeronautics and Astronautics), Robert Dutton (Electrical Engineering), Ronald Fedkiw (Computer Science), Gene Golub (Computer Science), Joseph B. Keller (Mathematics, emeritus), Walter Murray (Management Science and Engineering), Joseph Oliger (Computer Science), George Papanicolaou (Mathematics); Associate Faculty: Khalid Aziz (Petroleum Engineering), Joel Feziger (Mechanical Engineering), George M. Homsy (Chemical Engineering), Thomas J. Hughes (Mechanical Engineering), Thomas Kailath (Electrical Engineering), T. P. Liu (Mathematics)
Affiliated Faculty: S. Boyd (Electrical Engineering), J. Cioffi (Electrical Engineering), R. Cottle (Management Science and Engineering), T. Cover (Electrical Engineering), G. Dantzig (Management Science and
Engineering, emeritus), A. Dembo (Mathematics), S. Doniach (Applied Physics), D. Donoho (Statistics), C. Eaves (Management Science and Engineering), J. Friedman (Statistics), I. Johnstone (Statistics), J. Koseff (Civil and Environmental Engineering), K. Law (Civil and Environmental Engineering), R. MacCormack (Aeronautics and Astronautics), P. Moin (Mechanical Engineering), A. B. Owen (Statistics), W. Reynolds (Mechanical Engineering, emeritus), B. Roth (Mechanical Engineering), M. Saunders (Management Science and Engineering), C. Steele (Mechanical Engineering), R. Street (Civil and Environmental Engineering)

The Scientific Computing and Computational Mathematics Program (SC/CM) is interdisciplinary and leads to the M.S. and Ph.D. degrees. It is designed for students interested in studying and developing computational tools in those aspects of applied mathematics central to modeling in the physical and engineering sciences. Graduates of this program are expected to be able to deal with a scientific problem from its formulation, moving through its mathematical analysis to algorithm development and implementation. The symbiosis of applied mathematics and numerical computing is stressed.

GRADUATE PROGRAMS

MASTER OF SCIENCE

The University’s basic requirements for the M.S. degree are discussed in the “Graduate Degrees” section of this bulletin.

A candidate must complete a program of 45 units of courses numbered 100 or greater. In addition, a number of courses at the 200 level or above are required. At least 36 of these units must be graded units, passed with a grade point average (GPA) of 3.0 (B) or better. The core curriculum is common to all degrees offered by the program, but is adapted according to the interests and prior education of the student. Deviations from the core curriculum must be justified in writing and approved by the student’s adviser and the SC/CM Committee. Courses that are waived rather than taken may not be counted towards the master’s degree. The student must fulfill credit requirements in each of the categories listed below.

CORE CURRICULUM

1. **Mathematics** (18 units): students are required to take Mathematics 220A,B,C. Nine additional units in math are required with at least 6 units at the 200 level. Suggested courses are Mathematics 173, 205A,B,C, 224, 230, 236, 237, 256A,B,C, 274, 276A,B; Statistics 300A,B,C, 305, 306A,B, 310A,B,C. Other courses can be substituted with consent of the adviser and the SC/CM Committee. Students should take those courses most suitable to their areas of specialization.

2. **Numerical Analysis** (12 units): students are required to take Computer Science 237A,B,C and an advanced course in numerical analysis such as: Computer Science (CS) 335, 336, 337, 339; Management Science and Engineering 312; Mechanical Engineering (ME) 233B, 235A,B,C; Statistics 327.

3. **Computer Science** (6-9 units): students can take a selection of courses from CS 109A,B, 212, 248, 260. This must include a course at the 200 level.

4. **Application Area** (9 units): students must take a focused program in an applications area such as fluid mechanics, operations research, or statistics. Courses must be at the 200 level or higher, and the program of concentration must be approved by the adviser and committee. Examples of suitable courses are: Aeronautics and Astronautics 210A,B, 214A,B,C; Electrical Engineering 363, 364, 365, 378A,B; ME 238A,B, 251A,B, 269.

5. **Seminar** (1 unit): students are required to regularly attend the Scientific Computing/Computational Mathematics seminar for one quarter. The seminar is held weekly during the academic year.

DOCTOR OF PHILOSOPHY

The University’s basic requirements for the Ph.D. degree (residence, dissertation, examination, and so on.) are discussed in the “Graduate Degrees” section of this bulletin. The following are the program’s requirements:

1. Plan and successfully complete a coherent program of study covering the basic areas of Scientific Computing and Computational Mathematics. It must at least satisfy the requirements for the M.S. degree in SC/CM. It is important that the student be able to exhibit depth in some area of application. The student’s adviser has the primary responsibility for the adequacy of the program, which must meet the approval of the SC/CM Committee.

2. To be admitted to candidacy for the Ph.D. degree, a student must have successfully completed 27 units of graduate courses (200 level and above) and at least a 3.3 GPA in the courses. In addition, a student must pass a qualifying examination and find a thesis adviser. The qualifying examination must be taken within one year of admission into the Ph.D. program. The Ph.D. qualifying examination is based on the six required courses, 220A,B,C and 237A,B,C, listed in the core curriculum.

3. Beyond the requirements for candidacy, the student must complete a focused course of study of at least 48 units. The program should be designed to develop a deep, focused background in the research area to be pursued in the dissertation. Approval of the program must be obtained from the SC/CM Committee.

4. In addition, the student must have an adequate knowledge of a coherent area of application and must complete at least 12 units in that area.

5. The most important requirement for the Ph.D. is the dissertation. A reading committee must be selected before the student is admitted to Terminal Graduate Registration (TGR), and this committee should be frequently consulted by the student before the University oral examination. Upon completion of a draft of the dissertation, the student must pass a University oral examination in defense of the dissertation.

Ph.D. MINOR

Students wishing to obtain a Ph.D. minor in the Scientific Computing and Computational Mathematics Program should consult the department office for designation of a minor adviser. A minor in SC/CM may be obtained by completing 20 units of course work, including the sequences Mathematics 220A,B,C and Computer Science 237A,B,C; a GPA of 3.3 or better must be maintained in these courses.

The student’s Ph.D. reading committee and University oral committee must include one faculty member who is associated with the SC/CM program.

COURSES

137. *Introduction to Scientific Computing*—(Enroll in Computer Science 137.) Prerequisites: Computer Science 106A; Mathematics 103 or 113 or equivalents.

3 units, Aut (Fedkiw)

138. *Matlab and Maple for Science and Engineering Applications*—(Enroll in Computer Science 138.)

4 units, Win (Staff)


220A. 3 units, Aut (Levandosky)

220B. 3 units, Win (Levandosky)

220C. 3 units, Spr (Mattingly)

237A,B,C. *Advanced Numerical Analysis*—(Enroll in Computer Science 237A,B,C)

237A. *Numerical Linear Algebra*—Prerequisites: Computer Science 106A, 137; Mathematics 103 or 113.

3 units, Aut (Golub)
237B. Numerical Solution of Initial Value Problems—Prerequisites: Mathematics 130, 131.
   3 units, Win (Oliger)

237C. Numerical Solution of Boundary Value Problems—Prerequisites: Mathematics 130, 131.
   3 units, Spr (Wan)

238. Parallel Methods in Numerical Analysis—(Enroll in Computer Science 238.) Prerequisite: Mechanical Engineering 200A or Computer Science 237A, or consent of instructor.
   3 units, Win (Alonso, Wan)

336. Advanced Methods in Matrix Computation—(Enroll in Computer Science 336.)
   3 units (Golub)

337. Numerical Methods for Initial Boundary Value Problems—
   (Enroll in Computer Science 337.)
   3 units, Spr (Staff)

339. Topics in Numerical Analysis—(Enroll in Computer Science 339.)
   2-3 units, Aut (Van Huffel) alternate years, not given 2001-02
   Win (Golub)

340. SCCM Consulting Workshop
   1-3 units, any quarter (Murray)

398. Curricular Practical Training—Provides students with on-the-job training under the guidance of experienced, on-site supervisors. Students must register the quarter after their training. Students receive credit and a grade after submitting a concise report detailing work activities, problems worked on, and key results. Prerequisite: written consent of adviser.
   1 unit, any quarter (Staff)

399. Independent Project
   any quarter (Staff)

499. Advanced Reading and Research—Prerequisites: majoring in Scientific Computing and Computational Mathematics; consent of instructor.
   any quarter (Staff)

530. Applied Mathematics/Scientific Computing Seminar—(Enroll in Computer Science 530.)
   1 unit, Aut, Win, Spr (Staff)

   1 unit, Aut, Win, Spr (Staff)
School of Humanities and Sciences

Dean: Malcolm R. Beasley
Cognizant Deans: Keith Baker, Russell Berman, John Brauman
Associate Dean for Development: Robert Franklin
Assistant Deans: Judith Cain, Roni Holotien, Geneve Lopez
Department Chairs: Carl Bielefeldt (Religious Studies), Robert Byer (Applied Physics), Carolyn Lougee Chappell (History), Steve Chu (Physics), Gregory Freidin (Slavic Languages and Literatures), Thomas Grey (Music), H. Craig Heller (Biological Sciences), Mark R. Lepper (Psychology), Stanley Peters (Linguistics), Robert M. Polhemus (English), Michael Ramsaur (Drama), Orrin Robinson (German Studies), Kristine Samuelson (Communication), Jeffrey Schnapp (French and Italian), David Siegmund (Statistics), Leon Simon (Mathematics), George Somero (Hopkins Marine Station), Susan Stephens (Classics), Chao Fen Sun (Asian Languages), Barry Trost (Chemistry), Richard Vinograd (Art and Art History), Sylvia Yanagisako (Cultural and Social Anthropology), Yvonne Yarbro-Bejarano (Spanish and Portuguese), Andrew Walder (Sociology), Barry R. Weingast (Political Science), Gavin Wright (Economics); Anthropological Sciences, Comparative Literature, Philosophy to be announced

The School of Humanities and Sciences, with over 40 departments and interdepartmental degree programs, is the primary focus for the superior liberal arts education offered by Stanford University. Through exposure to the humanities, undergraduates study the ethical, aesthetic, and intellectual dimensions of the human experience, past and present, and so are prepared to make thoughtful and imaginative contributions to the culture of the future. Through the study of social, political, and economic events, they acquire theories and techniques for the analysis of specific societal issues, as well as general cross-cultural perspectives on the human condition. And through exposure to the methods and discoveries of mathematics and the sciences, they will become better-informed participants and leaders in today’s increasingly technological societies.

Further, the exciting research environment within the school offers both undergraduates and graduate students the intellectual adventure of working on their own research projects side by side with the school’s distinguished faculty. While a few of the school’s graduate programs offer professional degrees such as the Master of Fine Arts, most are academic and research programs leading to the Ph.D. Doctoral programs emphasize original scholarly work by the graduate students, often at the frontiers of knowledge, and normally require the students to participate in the supervised teaching of undergraduates. Indeed, in the school, as in the University more broadly, graduate students are of central importance in developing a community of scholars.

The fact that so many different disciplines lie within the same organization is one reason why the school has had great success in promoting interdisciplinary teaching and research programs. Whether engaged in studies as wide ranging as ethics, policy, and technological issues, or by applying contemporary social and philosophical theories to classical literature, our undergraduates, graduate students, and faculty are challenging the barriers among scholarly disciplines. The school will continue to strive for a balance between teaching and research, the academy and society.

ORGANIZATION

The School of Humanities and Sciences includes the departments of Anthropological Sciences, Applied Physics, Art and Art History, Asian Languages, Biological Sciences (and the Hopkins Marine Station), Chemistry, Classics, Communication, Comparative Literature, Cultural and Social Anthropology, Drama, Economics, English, French and Italian, German Studies, History, Linguistics, Mathematics, Music, Philosophy, Physics, Political Science, Psychology, Religious Studies, Slavic Languages and Literatures, Sociology, Spanish and Portuguese, and Statistics.

The school also includes 16 interdepartmental degree programs: African and African American Studies; American Studies; Comparative Studies in Race and Ethnicity; East Asian Studies; Human Biology; Feminist Studies; Interdisciplinary Studies in Humanities; International Studies; International Relations; Latin American Studies; Mathematical and Computational Science; Modern Thought and Literature; Public Policy; Russian and East European Studies; Science, Technology, and Society; Symbolic Systems; and Urban Studies.

In addition, the school sponsors programs that do not currently grant degrees: African Studies, Astronomy, Black Performing Arts, Ethics in Society, History and Philosophy of Science, Jewish Studies, Medieval Studies, Overseas Studies, the Social Science History Institute, and Undergraduate Research Opportunities. Faculty and academic staff of the School of Humanities and Sciences are listed under the respective departments or programs.

DEGREES OFFERED

Candidates for the degree of Bachelor of Arts, Bachelor of Science, Bachelor of Arts and Sciences, Master of Arts, Master of Fine Arts, Master of Science, Doctor of Musical Arts, or Doctor of Philosophy should consult appropriate sections of the announcements following. They should consult also the department or program in which they intend to specialize.

PROGRAM IN AFRICAN AND AFRICAN AMERICAN STUDIES

Director: John R. Rickford
Associate Director: Diann W. McCants
Advisory Committee: (Committee Chair) Arnold Rampersad (English); David Abernethy (Political Science), Clay Carson (History), Sandra Drake (English), Morris Graves (Associate Dean of Students), Jerri Kay (African and African American Studies), Kimberly Melton (African and African American Studies), Elaine C. Ray (Assistant Director, University Communications), Michael Thompson (History)

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The African and American Studies (AAAS) program covers a vast and varied field, including: (I) the history, literature, culture, and social science of African Americans as a central component of American culture; and (II) the history, literature, culture, and social science of the peoples of Africa and the African Diaspora. AAAS is an indispensable subject for those interested in the cultural, economic, historical, political, or social study of the United States.

To investigate the rich and varied human tapestry which AAAS spans, students are encouraged to use interdisciplinary methods drawn from anthropology, art, art history, economics, languages, linguistics and literature, music, philosophy, political science, psychology, religion, and sociology, among others. A degree in AAAS prepares students for the many work positions requiring a broad liberal arts perspective, as well as those requiring the specialized knowledge that AAAS offers. Students in AAAS receive training that is especially valuable for graduate study and/or careers in such fields as business, comparative literature, creative writing, education, journalism, law, linguistics, medicine, performing arts, politics, social sciences, social work, and urban studies. The program emphasizes creative scholarship and research through various means.

The AAAS Major—All majors and double majors are expected to complete a total of 60 units, of which 25 units must be selected from the AAAS core courses (AAAS 105 and 187N are mandatory). Since AAAS is affiliated with the program in Comparative Studies in Race and Eth-
nicity (CSRE), AAAS students must also enroll in two CSRE core introductory courses and complete a CSRE senior seminar (a writing intensive course of 5 units) before graduating. Additionally, 20 units are to be selected from areas I (African American Studies) or II (African and the African Diaspora), or a special program, area III, devised by the student. No more than two courses of a general nature (for example, Sociology 145, which deals with race and ethnicity, but without a primary African or African American focus) may be counted towards the major. All majors must include at least one course from area I and II. Each of these options consolidates and broadens the work of the core. Students who choose option III may devise a program with a special theme. This choice allows the student to use up to 20 units to explore issues encountered in other courses in greater depth, or to strike out in new directions. Students who choose option III should work closely with an adviser and must have written approval from the director of the program.

**Directed Reading**—AAAS 190A, B, C allows students to focus up to 10 units of work on a special topic of interest. In organizing this plan, the student consults with the program director and a faculty member specializing in the area or discipline.

**CORE COURSES**

The core consists of 25 units, including the two required courses (*), and 15 additional units selected from the following list:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAAS 105. Introduction to African and African American Studies*</td>
<td>5</td>
</tr>
<tr>
<td>AAAS 106A. African and African American Lecture Series (Aut)</td>
<td>1-3</td>
</tr>
<tr>
<td>AAAS 106B. African and African American Lecture Series (Win)</td>
<td>1-4</td>
</tr>
<tr>
<td>AAAS 106C. African and African American Lecture Series (Spr)</td>
<td>1-3</td>
</tr>
<tr>
<td>AAAS 107. African and African American Learning Expedition: Ghana</td>
<td>1</td>
</tr>
<tr>
<td>AAAS 187N/English 187N. Seminar: W.E.B. Du Bois and American Culture**</td>
<td>5</td>
</tr>
<tr>
<td>Comp. Lit. 170E. Introduction to African Systems of Thought</td>
<td>4</td>
</tr>
<tr>
<td>English 168B. Introduction to African American Literature</td>
<td>5</td>
</tr>
<tr>
<td>French &amp; lt. 133. Literature and Society: Introduction to Francophone Literature from Africa and the Caribbean</td>
<td>4</td>
</tr>
<tr>
<td>Hist. 148. Introduction to African History</td>
<td>5</td>
</tr>
<tr>
<td>Hist. 148C. Africa in the 20th Century</td>
<td>5</td>
</tr>
<tr>
<td>Hist. 150A. African American History to the 20th Century</td>
<td>5</td>
</tr>
<tr>
<td>Hist. 150B. Introduction to African American History: The Modern Black Freedom Struggle</td>
<td>5</td>
</tr>
<tr>
<td>Linguistics 73. African American Vernacular English</td>
<td>4</td>
</tr>
<tr>
<td>Pol. Sci. 118A. Political Change in Tropical Africa</td>
<td>5</td>
</tr>
<tr>
<td>Pol. Sci. 181. African Americans and the Political System</td>
<td>5</td>
</tr>
<tr>
<td>Psych. 174. African American Psychology</td>
<td>3</td>
</tr>
</tbody>
</table>

**[AREA I] AFRICAN AMERICAN HISTORY, LITERATURE, CULTURE, AND SOCIETY**

Area I majors choose at least 20 units in addition to the core, selected from the following list, plus at least one course from the Area II list (below):

**AFRICAN AND AFRICAN AMERICAN STUDIES**

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>106A. African and African American Lecture Series</td>
<td>A</td>
</tr>
<tr>
<td>106B. African and African American Lecture Series—Ghana</td>
<td>W</td>
</tr>
<tr>
<td>106C. African and African American Lecture Series</td>
<td>S</td>
</tr>
<tr>
<td>107. African and African American Learning Expedition: Ghana</td>
<td>S</td>
</tr>
</tbody>
</table>

**SOCIAL SCIENCES**

Area I minors must choose at least two courses below.

**Anthropological Sciences:**

105. Race, Gender, and Biology

**Economics:**

116. American Economic History

**Education:**

141. Race, Education, and the Media

156X. Understanding Racial and Ethnic Identity

175X. African American English in Educational Context

193C. Peer Counseling: The African American Community

201A. History of African American Education through 1940

201B. Education for Liberation

**Cultural and Social Anthropology:**

88. Theories of Race and Ethnicity: A Comparative Perspective

**Linguistics:**

73. African American Vernacular English

173. African American English in Educational Context

**Political Science:**

179G. Black Politics in the Post-Civil Rights Era

192F. Seminar Political of Race and Ethnicity in the United States

196. Issues of Race in American Politics

197P. Seminar: Political Beliefs and Values of Black Americans

197S. Seminar: Prejudice and Group Conflict

296. Seminar: Racial and Ethnic Politics in the U.S.

**Psychology:**

174. African American Psychology

175. Seminar on Topics in Identity Development

180. Social Psychological Perspectives on Stereotyping and Prejudice

**Sociology:**

145. Race and Ethnic Relations

149. The Urban Underclass

**HUMANITIES**

Area I minors must choose at least two courses below.

**Drama (Dance):**

44. Jazz Dance I

44. Jazz Dance II

45. Jazz Dance III

156. Contemporary Ethnic Drama

163. Performance and America

**English:**

161A. Afro-American Writing. 1950-1970

162G. Writings by 20th-Century Women of Color

162H. Literature of African Diaspora

168B. Introduction to Afro-American Literature

187B. Seminar: Central issues in African American Intellectual History

187N. Seminar: W.E.B. Du Bois and American Culture (same as AAAS 187N)

**History:**

47Q. Stanford Introductory Seminar: The Language of African American Names—A History of Naming Traditions

50N. Stanford Introductory Seminar: The Black Atlantic

51S. Sources and Methods Seminar: The Politics of Self-Definition—Ethnic Nationalism in the Civil Rights Era

57Q. Stanford Introductory Seminar: Martin Luther King, Jr.—Interactive

61. The Constitution and Race

64. Introduction to Race and Ethnicity in the American Experience

65. Comparative Studies in Race and Ethnicity

147B. The Idea of Africa among African Americans

150A. African American History to the 20th Century

150B. Introduction to African American History: The Modern Black Freedom Struggle

157. Introduction to African American History: The Modern Black Freedom Struggle

165A. Colonial and Revolutionary America

165B. 19th-Century America

165C. The United States in the 20th-Century

200M. Undergraduate Directed Research: Martin Luther King, Jr. Papers Project

249. Undergraduate Colloquium: Religions, Cultures, and History in West Africa and the African Americas

249A. Undergraduate Colloquium: The Issue of Greatness in Black History

249B. Undergraduate Colloquium: Black Visual Arts and Black History

250. Undergraduate Colloquium: American Popular Culture

250C. Undergraduate Colloquium: Thomas Jefferson and His World

252S. Undergraduate Research Seminar: Museums and History

253A. Undergraduate Colloquium: Culture and Ideologies of Race

259. Undergraduate Colloquium: Black and White in the United States and South Africa

263B. Undergraduate Colloquium: The Making of the Atlantic World, 1600-1960

264S. Undergraduate Research Seminar: The Papers of Martin Luther King, Jr. and the Modern Civil Rights Movement

269. Undergraduate Colloquium: The African-American Community Organizing Tradition

**Music:**

18A. Jazz History: Ragtime to Bebop (1900-1945)

18B. Jazz History: Bebop to Present (1940-)

20A. Jazz Theory

20R. Advanced Jazz Theory

161B. Jazz Ensemble

**Philosophy:**

177. Philosophical Issues Concerning Race and Racism

**Religious Studies:**

2N. Stanford Introductory Seminar: Prophecy and Politics in America—The Religious Thought of Abraham Joshua Heschel and Martin Luther King, Jr.

163. Religion and Ethnicity
AREA II: AFRICAN HISTORY, CULTURE, AND SOCIETY: HISTORY, CULTURE, AND SOCIETY OF THE BLACK DIASPORA

Area II majors choose at least 20 units in addition to the cores selected from the following lists, plus at least one course from the Area I list (above):

AFRICAN AND AFRICAN AMERICAN STUDIES
106A. African and African American Lecture Series
106B. African and African American Lecture Series
106C. African and African American Lecture Series
107. African and African American Learning Expedition: Ghana

SOCIAL SCIENCES
Area II minors must choose at least two courses below.

Cultural and Social Anthropology:
72. Dance and Culture in Latin America
88. Theories of Race and Ethnicity

Linguistics
185/285. Structure of an African Language

Political Science:
25. Colonialism and Nationalism in the Third World
118A. Political Change in Tropical Africa
118B. The Politics of Race and Class in Southern Africa

HUMANITIES
Area II minors must choose at least two courses below.

Comparative Literature:
103. Egyptian East/Egyptian West
170E. Introduction to African Systems of Thought

Drama (Dance):
43. Afro-Brazilian and Afro-Peruvian Dance
143. Afro-American Roots of American Concert Dance

English:
161E. Modern African Writing in English
162H. Literature of the African Diaspora
187T. Literature of South Africa

French and Italian:
133. Literature and Society in Africa and the Caribbean

History:
48Q. Stanford Introductory Seminar: South Africa—Contested Transitions
50N. Stanford Introductory Seminar: The Black Atlantic
50S. Sources and Methods Seminar: Race and Popular Culture (in Black and White)
57Q. Stanford Introductory Seminar: Martin Luther King, Jr.—Interactive
61. The Constitution and Race
65. Introduction to Comparative Studies in Race and Ethnicity
118B. The Politics of Race and Class in Southern Africa
147A. African History in Novels and Film
147B. The Idea of Africa among Africans
148. Introduction to African History
148C. Africa in the 20th Century
246. Undergraduate Colloquium: Successful Futures for Africa—An Inventory of the 1990s-2000s
246D. Undergraduate Colloquium: The Social History of Southern Africa
246S. Undergraduate Colloquium: Popular Culture in Africa
247. Undergraduate Colloquium: Greater East Africa and its Historical Writing
247A. Undergraduate Colloquium: African Identity in a Changing World
247B. Undergraduate Colloquium: Health and Society in Africa
247C. Undergraduate Colloquium: Africa and African Americans since World War II
247D. Undergraduate Colloquium: African Coiffure and its Legacy in the Americas
247S. Undergraduate Research Seminar: The Great Mau Mau Rebellion in 1950s Kenya
248. Undergraduate Colloquium: Governance and Civil Society in Africa
248A. Undergraduate Colloquium: The End of Slavery in Africa and the Americas
248D. Law and Colonialism in Africa
248S. Undergraduate Research Seminar: Colonial States and Societies in Africa
249A. Undergraduate Colloquium: The Issue of Greatness in Black History
249B. Undergraduate Colloquium: Black Visual Arts and Black History
249D. Undergraduate Colloquium: African Cultural History in the 20th Century

Language Center:
100A,B, C. Beginning Amharic
102A, B, C. Beginning Hausa
103A, B, C. Intermediate Hausa
107A, B, C. Beginning Swahili
107A, B, C. Intermediate Swahili
108A, B, C. Advanced Swahili
111A,B, C. Beginning Chichewa
133A, B, C. The African Evening Forum

Overseas Studies—Paris:
76. Contemporary African Literature in French

Political Science:
118B. The Politics of Race and Class in Southern Africa

Religious Studies:
110. Islam in the Modern World

Spanish and Portuguese:
171/272. Black Literature in Brazil

SENIOR SEMINAR

All AAAS majors must take at least one quarter of the CSRE Senior Seminar (see complete description of the seminar in the “Comparative Studies in Race and Ethnicity” section of this bulletin).

MINORS

Students who minor in AAAS must complete either (1) a total of six courses of 3 or more graded units, or (2) a minimum of 25 graded units from the list of AAAS courses listed above. The courses must include AAAS 105 and at least one course from the social sciences and one from the humanities. Students should develop a coherent theme in their course selections, in consultation with the program director or associate director.

AAAS stresses academic advising. The director or associate director advises all AAAS students, including majors, minors, and double majors. Additionally, majors and double majors have the opportunity to participate in individual and group mentoring activities offered by CCSRE. The program prides itself on its responsiveness to student concerns, and its Advisory Committee includes both faculty and student representation.

HONORS

Majors who have maintained at least 3.3 grade point average (GPA) or higher in the major may apply for the honors program. Students should apply in the Spring Quarter of their junior year for the honors program. The honors thesis is intended to enable students to synthesize several of the skills they have acquired and to produce a document or project demonstrating some measure of competence in their specialty. The honors thesis must be discussed with and approved by the major adviser and the program director. A student may receive 5-15 units for the honors thesis. All students completing an honors thesis must participate in at least two quarters of the CSRE Senior Seminar.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.


106A, B, C. African and African American Studies Lecture Series—Weekly lectures on aspects of African or African American artistic expression, culture, history, language, literature, music, politics, religion, society, or sport. One unit for attendance at lectures and submission of brief reports on each. Additional units require participation in preparatory and discussion sections, readings, and the opportunity to conduct and record biographical interviews with speakers in the lecture series for...
the AAAS archives. Students taking 107 must enroll in 106B for 4 units.
1-3 units, Aut (Rickford)
Win (Jackson)
Spr (McCants)

107. African and African American Studies Learning Expedition—
Third in a series of annual expeditions to regions of historical and/or
sociocultural interest in Africa and the African diaspora, this year to
expedition required for credit. Prerequisite: 106B for 4 units.
1 unit, Spr (Staff)

190A,B,C. Directed Reading
5-15 units, Aut, Win, Spr (Staff)

199A,B,C. Honors Project
5-15 units, Aut, Win, Spr (Staff)

AFFILIATED DEPARTMENT OFFERINGS
See the respective department listings for course descriptions and
General Education Requirements (GER) information.

COMPARATIVE LITERATURE
171. Comparative Narrations of Race, Ethnicity, and Nation
3-5 units (Palumbo-Liu) not given 2000-01

COMPARATIVE STUDIES IN RACE AND ETHNICITY
203. Race and Education: Strategies for Change in the 21st Century
5 units, Spr (Montoya, Steyer)

DRAMA
163. Performance and America
5 units, Aut (Elam)

DANCE
43. Afro-Brazilian and Afro-Peruvian Dance
1 unit, Aut (Cashion)

44. Jazz Dance I
1 unit, Aut, Win, Spr (Kramer)

143. Afro-American Roots of American Concert Dance
2 units, Win (Moses)

144. Jazz Dance II
1 unit, Aut, Spr (Moses)

EDUCATION
141. Race, Education, and Media
5 units (Carnoy, Steyer) not given 2000-01

156X. Understanding Racial and Ethnic Identity
5 units (LaFromboise) not given 2000-01

175X. African-American English in Educational Context—(Same as
275.)
3 units (Baugh) not given 2001-02

193C. Peer Counseling: The African-American Community
2 units, Aut (Edwards, Reede-Hoskins)

201A. History of African American Education through 1940
3 units (Williamson) given 2001-02

201B. Education for Liberation
3 units (Williamson) given 2001-02

ENGLISH
126. 20th Century American Fictions
5 units, Win (Saldivar)

161A. African American Writing, 1950-1970
5 units, Win (Drake)

161E. Modern African Writing in English
5 units, Spr (Drake)

162H. Literature of the African Diaspora
5 units, Win (D. Jones)

168B. Introduction to Afro-American Literature
5 units, Win (Rampersad)

187B. Seminar: Central Issues in African American Intellectual
History
5 units, Spr (Drake)

187N. Seminar: W. E. B. Du Bois and American Culture
5 units, Win (Rampersad)

HISTORY
50S. Sources and Methods Seminar: Race and Popular Culture (in
Black and White)
5 units (M. Thompson) not given 2000-01

51S. Sources and Methods Seminar: The Politics of Self-Definition—Ethnic Nationalism in the Civil Rights Era
5 units, Spr (Chavez)

61. The Constitution and Race
5 units (Rakove) not given 2000-01

65. Introduction to Comparative Studies in Race and Ethnicity
5 units, Spr (Camarillo)

147A. African History in Novels and Film
5 units (Jackson) not given 2000-01

147B. The Idea of Africa among African Americans
5 units (Jackson) not given 2000-01

148. Introduction to African History
5 units, Aut (Jackson)

148C. Africa in the 20th Century
5 units, Spr (R. Roberts)

150A. African-American History to the 20th Century
5 units, Aut (M. Thompson)

150B. Introduction to African-American History: The Modern Black
Freedom Struggle
5 units, Spr (Carson)

165A. Colonial and Revolutionary America
5 units, Aut (Wells)

165B. 19th-Century America
5 units, Win (White)

165C. The United States in the 20th Century
5 units, Spr (Kennedy)

200M. Undergraduate Directed Research: Martin Luther King, Jr.
Papers Project
units by arrangement (Carson)
246. Undergraduate Colloquium: Successful Futures for Africa—An Inventory of the 1990s-2000s
5 units, Spr (Jackson)

246S. Undergraduate Research Seminar: Popular Culture in Africa
5 units (Jackson) not given 2000-01

247. Undergraduate Colloquium: Greater East Africa and its Historical Writing—(Same as 347.)
5 units (Jackson) not given 2000-01

247A. Undergraduate Colloquium: African Identity in a Changing World
5 units (R. Roberts) not given 2000-01

247B. Undergraduate Colloquium: Health and Society in Africa
5 units (R. Roberts) not given 2000-01

247C. Undergraduate Colloquium: Africa and African Americans since World War II
5 units (Jackson) not given 2000-01

247D. Undergraduate Colloquium: African Coiffure and its Legacy in the Americas
4 units, Aut (Jackson)

247S. Undergraduate Research Seminar: The Great Mau Mau Rebellion in 1950s Kenya—(Same as 447.)
5 units (Jackson) not given 2000-01

248. Undergraduate Colloquium: Governance and Civil Society in Africa
5 units, Win (R. Roberts)

248A. Undergraduate Colloquium: The End of Slavery in Africa and the Americas
5 units (R. Roberts) not given 2000-01

248D. Undergraduate Colloquium: Law and Colonialism in Africa
5 units (R. Roberts) not given 2000-01

248S. Undergraduate Research Seminar: Colonial States and Societies in Africa
5 units, Win, Spr (R. Roberts)

249A. Undergraduate Colloquium: The Issue of Greatness in Black History
5 units (Jackson) not given 2000-01

249B. Undergraduate Colloquium: Black Visual Arts and Black History
5 units (Jackson) not given 2000-01

249D. Undergraduate Colloquium: African Culture History in the 20th Century
5 units, Win (Jackson)

250. Undergraduate Colloquium: American Popular Culture
5 units, Win (M. Thompson)

250C. Undergraduate Colloquium: Thomas Jefferson and His World
5 units (Rakove) not given 2000-01

252S. Undergraduate Research Seminar: Museums and History
5 units (Corn) not given 2000-01

253. Undergraduate Colloquium: Topics in African American History—The Great Migration
5 units (M. Thompson) not given 2000-01

255A. Undergraduate Colloquium: Culture and Ideologies of Race
5 units, Aut (M. Thompson)

257. Undergraduate Colloquium: Immigrants and Racial Minorities in American Cities—Comparative Perspectives
5 units (Carson) not given 2000-01

259. Undergraduate Colloquium: Race and Ethnicity in the United States and South Africa
5 units (Frederickson) not given 2000-01

264S. Undergraduate Colloquium: Martin Luther King, Jr. and the Modern Civil Rights Movement
5 units (Carson) not given 2000-01

269. Undergraduate Colloquium: The African American Community Organizing Tradition
5 units (Carson) not given 2000-01

LINGUISTICS
73. African American Vernacular English
3 units (Rickford) alternate years, given 2001-02

MUSIC
18. Jazz History
18B. Bebop to Present (1940-)
3 units, Spr (Berry)

20A. Jazz Theory
3 units, Aut (Nadel)

161B. Jazz Orchestra
1 unit, Aut, Win, Spr (Berry)

POLITICAL SCIENCE
25. Colonialism and Nationalism in the Third World
5 units (Abernethy) given 2001-02

118A. Political Change in Tropical Africa
5 units (Abernethy) given 2001-02

118B. The Politics of Race and Class in Southern Africa
5 units, Aut (Abernethy)

179G. Black Politics in the Post-Civil Rights Era
5 units, Win (Gay)

192F. Seminar: Politics of Race and Ethnicity in the United States
5 units (Fraga) not given 2000-01

196. Issues of Race in American Politics
5 units (Sniderman) not given 2000-01

197P. Seminar: Political Beliefs and Values of Black Americans
5 units, Win (Sniderman)

197S. Seminar: Prejudice and Group Conflict
5 units (Sniderman) not given 2000-01

PSYCHOLOGY
174. African American Psychology
3-4 units, Aut (McCants)

175. Seminar on Topics in Identity Development
3 units, Win (McCants)

180. Social Psychological Perspectives on Stereotyping and Prejudice
4 units (Eberhardt) alternate years, given 2001-02
OVERSEAS STUDIES

Courses approved for the African and African American Studies major and taught overseas can be found in the “Overseas Studies” section of this bulletin, or in the Overseas Studies office, 126 Sweet Hall.

PARIS

186F. Contemporary African Literature in French
4 units, Win (Rullier)

AFRICAN STUDIES

Emeriti: Paul F. Basch (Medicine), James L. Gibbs, Jr., Raymond D. Giraud, Joseph H. Greenberg, Bruce F. Johnston, Hans N. Weiler, Sylvia Wynter

Chair: Richard Roberts

Professors: David B. Abernethy (Political Science), Jean-Marie Apostolidis (French and Italian), Russell Berman (Comparative Literature, German Studies), Joan Bresnan (Linguistics), Martin Carnoy (Education), George M. Fredrickson (History), William B. Gould (Law), William R. Leben (Linguistics), Valentin Mudimbe (French and Italian, Comparative Literature), Scott R. Pearson, Richard Randell (Art and Art History), John Rickford (Linguistics, African and African American Studies), Richard Roberts (History)

Associate Professors: Sandra E. Drake (English), Akhil Gupta (Cultural and Social Anthropology), Karen A. Jackson, Jr. (History), Bruce Lusignan (Electrical Engineering), Elisabeth Mudimbe-Boyi (French and Italian, Comparative Literature)

Assistant Professors: Paulla A. Ebron (Cultural and Social Anthropology), Sonia Grier (Business), Joanna Mountain (Anthropological Sciences), Karen Mundy (School of Education)

Associate Professor (Research): David Katzstein (School of Medicine)

Senior Lecturer: Khalil Barhoum (Linguistics)

Consulting Professor: Joel Samoff (Center for African Studies)

Visiting Associate Professor: Ebrahim Moosa (Religious Studies)

Curators: Peter Duignan (Senior Fellow, emeritus, Hoover Institution), Karen Fung (Deputy Curator, Hoover Institution), Thomas Seligman (Director, Stanford Museum of Art and Lecturer, Department of Art and Art History)

Senior Research Fellows: Larry Diamond (Hoover Institution), Stephen Stedman (CISAC)

The Committee on African Studies coordinates an interdisciplinary program in African Studies for undergraduate and graduate students. Under special arrangement with the Stanford/Berkeley Joint Center for African Studies, it is possible to incorporate courses from both institutions into one’s program. Contact the center at (650) 723-0295 for a listing of courses offered at the University of California at Berkeley.

Courses in African Studies are offered by departments and programs throughout the University. Each year the committee sponsors a seminar to demonstrate to advanced undergraduate and graduate students how African topics of interest in African Studies are approached from different disciplinary perspectives. Each week’s presentation is conducted by a different professor, the first hour is a lecture, followed by a one-hour seminar discussion.

Course offerings in African languages are also coordinated by the Committee on African Studies. Along with regular courses in several levels of Swahili and Arabic, the committee arranges with the Special Language Program in the Stanford Language Center to offer instruction in other African languages. In recent years, the Special Language Program has offered courses in Bambara, Chichewa, Ewe, Fulani, Hausa, Maninka, Northern Sotho, Shona, and Wolof.

The Committee on African Studies does not sponsor degree programs, but undergraduates and graduate students can specialize in African Studies under a number of arrangements listed below.

UNDERGRADUATE PROGRAMS

Undergraduates may choose an African Studies focus among several alternatives:

1. A major in a traditionally defined academic department (for example, Anthropological Sciences, Cultural and Social Anthropology, History, Political Science, ...). These departments afford ample opportunity to enroll in courses outside the major, leaving the student free to pursue the interdisciplinary study of Africa.

2. Interdepartmental majors, such as African and African American Studies or International Relations, which offer coordinated and comprehensive interdisciplinary course sequences, permitting a concentration in African Studies.

3. An individually designed major. Under the supervision of a faculty adviser and two other faculty members, the student can plan a program of study focused on Africa that draws courses from any department or school in the University. If approved by the Dean’s Advisory Committee on Individually Designed Majors, the program becomes the curriculum for the A.B. degree.

Undergraduates can study for a year in Africa. In recent years, students have enrolled at the University of Cape Town, South Africa; University of Ghana at Legon; University of Nairobi, Kenya; and at Université du Benin, Togo. Students should check with the Overseas Studies office to see what arrangements are currently available.

MINORS

The Committee on African Studies awards a minor in African Studies. Students majoring in any field qualify for this minor by meeting the following requirements:

1. Taking a minimum of 25 units of African-related courses. Students may not overlap ("double-count") courses for completing major and minor requirements.

2. Having at least one quarter’s exposure to an African language. Africa is a linguistically heterogeneous region, and most Africans are multi-lingual. Learning an African language is an excellent way to learn about African cultures. The Center for African Studies and the Special Languages Program may arrange instruction in any of several languages spoken in West, East, Central, and Southern Africa.

3. Completing one introductory course that deals with more than one region of Africa.

4. Writing a 25-35 page research paper. This paper may be an extension of a previous paper written for an African Studies course.

5. Designate a focus of study (either disciplinary or regional) through a three course concentration.

Upon satisfactory completion of all requirements, final certification of the minor is made by the Center for African Studies and appears on the student’s transcript. For more information, call the Center for African Studies at (650) 723-0295 or see the Center’s website at http://www-leland.stanford.edu/dept/AFR/.

CERTIFICATE

Students may also choose to apply for a certificate in African Studies. Requirements for the certificate are the same as for the minor; however, students may double-count courses applied toward their major or graduate studies. The principal difference between the minor and the certificate, however, is that the certificate will not appear on one’s transcript. For more information and an application, please contact the center.

GRADUATE STUDY

For those who wish to specialize in Africa at the graduate level, African Studies can be designated a field of concentration within the master’s and doctoral programs of some academic departments. Students in the departments of Anthropological Sciences, Cultural and Social Anthropology, History, Political Science, and Sociology, and in the School of Education, may declare African Studies as the area of specialization for their master’s and Ph.D. thesis work. Some other departments, programs, and institutes such as International Policy Studies and the Inter-
national Comparative Education Program also permit students to specialize in African Studies. Stanford graduate students who are U.S. citizens or permanent residents may request an academic year application for a Foreign Language and Area Studies (FLAS) Fellowship from the Center at (650) 723-0295. The academic year FLAS application deadline is mid-January. For summer FLAS applications the deadline is mid-April. Students need not be enrolled at Stanford to apply for the summer Fellowship.

AFFILIATED DEPARTMENT OFFERINGS

See respective department listings for course descriptions and General Education Requirements (GER) information.

AFRICAN AND AFRICAN AMERICAN STUDIES

105. Introduction to African and African American Studies
5 units, Spr (McCants)

106ABC. African and African American Studies Lecture Series
1-3 units, Aut, (Rickford)
Win (Jackson)
Spr (McCants)

107. African and African American Studies Learning Expedition
1 unit, Spr (Staff)

CULTURAL AND SOCIAL ANTHROPOLOGY

88. Theories of Race and Ethnicity: A Comparative Perspective
5 units, Win (Yanagisako)

133A,B,C. Ethics of Development in a Global Environment (EDGE)—
(Same as Engineering 297A,B,C)
1-4 units, Aut, Win, Spr (Lusignan, Gupta)

DRAMA

43. Afro-Brazilian and Afro-Peruvian Dance
1 unit, Aut (Cashion)

143. Afro-American Roots of American Concert Dance
2 units, Win (Moses)

EDUCATION

107. Seminar: The Politics of International Cooperation in Education
3-4 units, Spr (Mundy)

136. World, Societal, and Educational Change: Comparative Perspectives
4-5 units (Ramirez) not given 2000-01

202. Introduction to Comparative and International Education
4-5 units, Aut (Mundy)

2021. Education Policy Workshop in International and Comparative Education
2-3 units, Aut (Mundy)

306A. Education and Economic Development
5 units, Win (Carnoy)

306B. The Politics of International Cooperation in Education
3-4 units, Spr (Mundy)

314. Workshop in Economics of Education
1-2 units, Aut, Win, Spr (Carnoy)

405. Education and Political Change
4-5 units (Mundy) not given 2000-01

ENGLISH

68B/168B. Introduction to Afro-American Literature
3 or 5 units, Win (Rampersad)

FRENCH AND ITALIAN

133. Literature and Society: Introduction to Francophone Literature from Africa and the Caribbean
4 units, Win (Boyì)

HISTORY

148. Introduction to African History
5 units, Aut (Jackson)

148B. Northeast Africa and the Red Sea: Imperialism, Regional Identities, Postcolonial Conflicts
5 units, Win (Killion)

148C. Africa in the 20th Century
5 units, Spr (R. Roberts)

150A. African-American History to the 20th Century
5 units, Aut (M. Thompson)

246/346. Undergraduate/Graduate Colloquium: Successful Futures for Africa—An Inventory of the 1990s-2000s
5 units, Spr (Jackson)

247D/347D. Undergraduate/Graduate Colloquium: African Coiffure and Its Legacy in the Americas
4 units, Aut (Jackson)

248. Undergraduate Colloquium: Governance and Civil Society in Africa
5 units, Win (R. Roberts)

248S/448A. Undergraduate/Graduate Research Seminar: Colonial States and African Societies
5 units, Win, Spr (R. Roberts)

249D/349D. Undergraduate/Graduate Colloquium: African Cultural History in the 20th Century
5 units, Win (Jackson)

305. Graduate Workshop in Teaching
1 unit, Spr (R. Roberts)

306B. Design and Methodology for International Field Research
1 unit, Win (Kollman, R. Roberts)

347B. Graduate Core Colloquium in African History: The Colonial Period
4-5 units, Aut (R. Roberts)

LANGUAGE CENTER

SPECIAL LANGUAGE PROGRAM

106A,B,C. Beginning Swahili
106A. 4 units, Aut (Staff)
106B. 4 units, Win (Staff)
106C. 4 units, Spr (Staff)

107A,B,C. Intermediate Swahili
107A. 4 units, Aut (Staff)
107B. 4 units, Win (Staff)
107C. 4 units, Spr (Staff)

108A,B,C. Advanced Swahili
108A. 4 units, Aut (Staff)
108B. 4 units, Win (Staff)
SCHOOL OF HUMANITIES AND SCIENCES

AMERICAN STUDIES

Administrative Committee: (Chair) Barton J. Bernstein (History); Rudy Busto (Religious Studies), Albert Camarillo (History), Gordon Chang (History), Joseph Corn (American Studies Program Coordinator), Wanda Corn (Art and Art History), Arnold Eisen (Religious Studies), on leave), Jay Fliegelman (English), George Fredrickson (History), Richard Gillam (American Studies Program Coordinator), Doug McAdam (Sociology), Alexander Nemerov (Art and Art History), Jack Rakove (History), Ramon Saldivar (English, and Comparative Literature), William Solomon (English), Richard White (History), Gavin Wright (Economics).

The American Studies program is administered through the office of Interdisciplinary Studies in Humanities; see http://www.stanford.edu/group/HSPI/AmStud/.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The purpose of the American Studies program is to provide students with a comprehensive and critical interdisciplinary understanding of the American experience. The program builds on a series of core courses emphasizing intellectual and cultural as well as historical and legal analysis. American Studies is also a broadly multicultural major that gives serious curricular attention to issues of diversity, especially as raised by distinctions of race, class, ethnicity, and gender. All majors take an intensive seminar, "Perspectives on American Identity," that explores the tension between commonality and difference, and society and group, from a variety of disciplinary perspectives. The program stresses the study of multiculturalism in depth as well as breadth by requiring students to take at least two approved classes focusing specifically on race and ethnicity. Majors who take five or more such courses have the option of graduating with a race and ethnicity specialization in American Studies.

All American Studies majors work closely with a faculty coordinator to develop an independent study plan consisting of 14 (or more) courses totaling at least 60 units. All are to be taken for a letter grade. Study plans must emphasize one of four general concentrations or areas of interest (History and Society; Literature and Thought; Visual and Material Culture; and Politics, Policy, and Economics).

Concentration Requirements—All majors must take a total of eleven courses in four areas of concentration: (1) History and Society; (2) Literature and Thought; (3) Visual and Material Culture; and (4) Politics, Policy, and Economics. These eleven courses, in all cases, include American Studies 150, and History 165A and 165B, plus two courses to satisfy the race and ethnicity requirement (described in the section below). In addition, majors must meet the following minimum distribution requirements: five courses sufficient to provide a solid grounding in a chosen area of concentration; six courses in the other three areas, with at least one course in each area.

Seminar Requirements—All majors must take American Studies 200, Perspectives on American Identity, plus a second seminar (or colloquium) requiring a substantial paper. Neither American Studies 200 nor the second seminar count towards the eleven-course concentration requirement described above. However, students who complete more than these two required seminars may count such additional seminars towards their eleven-course concentration requirement. Most courses that fulfill the second seminar requirement are so noted in the updated list available at the program office. There may be other courses that fulfill this requirement; students should consult the chair or one of the program coordinators in such cases. Seminars taken under the aegis of the Stanford-in-Washington program may also fulfill the second seminar requirement.

Race and Ethnicity Component—Students must take at least two courses in the area of race and ethnicity. One of these two courses may count either towards the eleven-course concentration requirement or, if appropriate, as the second seminar. A list of courses satisfying this requirement may be obtained from the program office.

Optional Specialization in Race and Ethnicity—Students who take at least five approved race and ethnicity courses graduate with an American Studies specialization in race and ethnicity. This is noted on the final undergraduate transcript.

MINORS

Students wishing to earn an undergraduate minor in American Studies must complete seven courses for a minimum of 27 units. All students take the program's core course, American Studies 150/English 121, American Literature and Culture to 1855 (5 units), as an introduction to the critical study of American literature and culture. Students also complete two of the following four courses in American history (10 units) to provide a historical foundation:

- History 165A. Colonial and Revolutionary America
- History 165B. 19th-Century America
- History 165C. The United States in the 20th Century
- History 172A. America since 1945

Additionally, students choose four elective courses appropriate to their particular interests from courses listed under American Studies (12-20 units). These courses should be selected with one of two goals in mind: to give the student a breadth of exposure to various issues in American Studies; and to give the student an opportunity to study an area of American Studies in depth (for example, arts and letters, history, social institutions, policy) or to focus on a particular issue in American Studies (for example, technology in America, race and ethnicity in America, American art and material culture).
All courses counted toward the minor in American Studies must be taken for a letter grade. No course which counts toward the minor can also count toward a student's major.

HONORS PROGRAM

Preferably during the junior year and no later than the third quarter before graduation, majors with demonstrated interest and ability in American Studies may apply to seek honors by writing a senior thesis for 10 to 15 units of credit. This application is to include the topic and a proposed outline of the senior thesis and should be signed by a Stanford faculty member who is willing to direct the student's thesis during the ensuing year. The program may approve the application or request resubmission with revisions. The finished essay must be submitted three weeks before the date of graduation. Units for the honors project must be in addition to the 60-unit major.

COURSES

See departmental listings for complete descriptions and University General Education Requirements (GER) notations. Some courses may require prerequisites that do not apply toward the major. See the Time Schedule each quarter for changes in listings. An up-to-date list is available in the program office.

AMERICAN STUDIES

150. American Literature and Culture to 1855—(Same as English 121.) Required for American Studies major. Reading texts from Cotton Mather to Melville, students examine the major issues in early American cultural and literary history. Developments in the fine and domestic arts, and methodological issues associated with the enterprise called "American Studies." (Literature and Thought) GER:3a (DR:7)
5 units, Win (Fliegelman)

151. The Transformation of American Thought and Culture, 1865 to the Present—Persistent strains and tensions in American intellectual life and culture over the past 125 years. Readings include autobiographies, novels, documentary works, and historical and theoretical analyses that bear on issues of technology and culture, consumerism, mass society, gender, sexuality, violence, political extremism, and power. (History and Society, or Literature and Thought) GER:3a (DR:7 or 8)
5 units, Win (Gillam)

152. American Spaces: An Introduction to Material Culture and the Built Environment—(Same as History 152.) American history through the evidence of things, e.g., spaces, buildings, and landscapes of the "built environment." How to "read" such artifacts using methods and theories from anthropology, cultural geography, history, and other disciplines. (Visual and Material Culture) GER:3b (DR:9)
5 units (Corn) given 2001-02

179. Introduction to American Law—(Same as Law 106, Political Science 182F.) American law for undergraduates. The structure of the American legal system, including the courts; American legal culture; the legal profession and its social role; the scope and reach of the legal system; the background and impact of legal regulation; the relationship between the American legal system and American society in general. (History and Society; or Politics, Policy, and Economics) GER:3b (DR:9)
5 units, Aut (Friedman)

RACE AND ETHNICITY

Two approved race and ethnicity courses are required of all majors. (For details, see previous description of "Undergraduate Programs.") Approved courses include, but are not limited to those offered through the Program in Comparative Studies in Race and Ethnicity. For example, see History 65.
75. The United States and East Asia
115. Technology and Culture in 19th-Century America
150A. African-American History to the 20th Century
159. Introduction to Asian American History

165A. Colonial and Revolutionary America—Required for American Studies major.
165B. 19th-Century America—Required for American Studies major.
165C. The United States in the 20th Century
172A. The United States since 1945
173C. Introduction to Feminist Studies
250B. Undergraduate Colloquium: Constitutional Interpretation in History and Theory
252. Undergraduate Colloquium: Decision-Making in International Crises—The A-Bomb, the Korean War, and the Cuban Missile Crisis
255A. Undergraduate Colloquium: Culture and Ideologies of Race
265. Undergraduate Colloquium: New Research in Asian American History
265A. Undergraduate Colloquium: The History of Sexuality in the United States
274A. Undergraduate Colloquium: Body Works—Medicine, Technology, and the Body in late 20th-Century America
281A. Undergraduate Colloquium: Environmental History of the Americas

PSYCHOLOGY
174. African American Psychology

SOCIOLOGY
25N. Stanford Introductory Seminar: Understanding the Sixties
27N. Stanford Introductory Seminar: Cultural Patterns in Contemporary Society
138/238. American Indians in Comparative Historical Perspective
139/239. American Indians in Contemporary Society
149. The Urban Underclass
150. The Family

SCIENCE, TECHNOLOGY, AND SOCIETY
101. Science, Technology, and Contemporary Society

LITERATURE AND THOUGHT
114. Visions of the 1960s—See description under "History and Society."
150. American Literature and Culture to 1855—(Same as English 121.) See “Core Lectures.”
151. The Transformation of American Thought and Culture, 1865 to the Present—See “Core Lectures.”
214. The American 1960s: Thought, Protest, and Culture

AFRICAN AND AFRICAN AMERICAN STUDIES
105. Introduction to African and African American Studies

COMPARATIVE LITERATURE
24Q. Stanford Introductory Seminar: Ethnicity and Literature—Preference to sophomores.

168. Introduction to Asian American Culture

202. Comparative Ethnic Autobiography

DRAMA
65. American Musical Theater: Broadway/Hollywood

156. Social Dances of North America III
163. Performance and America
179. Teatro America Workshop: The Theater of Native/Chicano America

180Q. Stanford Introductory Seminar: Noam Chomsky—The Drama of Resistance

ENGLISH
104C. Language and Gender in Contemporary American Fiction
105. The Language of Short Stories

112. Masterpieces of American Literature
123D. The Multicultural Moment: American Literature from the Civil War to World War I

125B. American Modernism
125C. American Fiction Between the Wars
127. American Autobiography

161A. African-American Writing, 1950-1970
162H. Literature of the African Diaspora
167A. Americans in Paris

168. American Indian Mythology, Legend, and Lore
168B. Introduction to African-American Literature

179E. Hemingway and Fitzgerald
179H. Mark Twain and the Gilded Age

186B. Seminar: Melville
186J. Seminar: American Thought and Literature—Jefferson to the Jameses

186K. Seminar: The Social Novel in America
187B. Seminar: Central Issues in African-American Intellectual History

187D. Seminar: Modern British and American Poetry
187M. Seminar: The American Long Poem
<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>187N</td>
<td>Seminar: W. E. B. DuBois and American Culture</td>
</tr>
<tr>
<td>229</td>
<td>American Literature and the Grotesque</td>
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<tr>
<td><strong>MUSIC</strong></td>
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<tr>
<td>18A</td>
<td>Ragtime to Bebop (1900-1940)</td>
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<td>18B</td>
<td>Bebop to Present (1940-)</td>
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<tr>
<td><strong>PHILOSOPHY</strong></td>
<td></td>
</tr>
<tr>
<td>177</td>
<td>Philosophical Issues Concerning Race and Racism</td>
</tr>
<tr>
<td><strong>RELIGIOUS STUDIES</strong></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Religion in America</td>
</tr>
<tr>
<td>143</td>
<td>Chicano/Latino Religious Traditions</td>
</tr>
<tr>
<td>163</td>
<td>Religion and Ethnicity/Race</td>
</tr>
<tr>
<td><strong>SPANISH</strong></td>
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</tr>
<tr>
<td>110N</td>
<td>Stanford Introductory Seminar: Introduction to Research in Chicana/o Literature and Visual Art</td>
</tr>
<tr>
<td>132</td>
<td>Mexican and Chicano Cultural Perspectives</td>
</tr>
<tr>
<td>180E</td>
<td>Introduction to Chicana/o Cultural Studies</td>
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<td><strong>VISUAL AND MATERIAL CULTURE</strong></td>
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<tr>
<td>152</td>
<td>American Spaces: Introduction to Material Culture and the Built Environment—(Same as History 152.) See “Core Lectures.”</td>
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<td><strong>ART AND ART HISTORY</strong></td>
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<tr>
<td>130</td>
<td>Art in America and Britain, 1670-1825: Culture and Politics</td>
</tr>
<tr>
<td>167</td>
<td>The Hollywood Musical</td>
</tr>
<tr>
<td>258</td>
<td>Undergraduate Seminar: War and Representation</td>
</tr>
<tr>
<td><strong>COMMUNICATION</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Mass Communication and Society: Media Technologies, People, and Society</td>
</tr>
<tr>
<td>141A</td>
<td>History of Film: The First 50 Years</td>
</tr>
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<td><strong>DRAMA</strong></td>
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<tr>
<td>65</td>
<td>American Musical Theater: Broadway/Hollywood</td>
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<tr>
<td>156</td>
<td>Social Dances of North America III</td>
</tr>
<tr>
<td>163</td>
<td>Performance and America</td>
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<td>179</td>
<td>Teatro America Workshop: The Theater of Native/Chicano America</td>
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<tr>
<td><strong>ENGLISH</strong></td>
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<tr>
<td>160K</td>
<td>Gender and American Cinema: 1930-1950—The Woman’s Film and Film Noir</td>
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<tr>
<td><strong>HISTORY</strong></td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>Undergraduate Colloquium: American Popular Culture</td>
</tr>
<tr>
<td><strong>SPANISH</strong></td>
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<tr>
<td>112N</td>
<td>Stanford Introductory Seminar: The U.S.-Mexico Border Region in Film and Literature</td>
</tr>
</tbody>
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**POLITICS, POLICY, AND ECONOMICS**

179. Introduction to American Law—(Same as Law 106, Political Science 182F.) See “Core Lectures.”

**COMMUNICATION**

1. Mass Communication and Society: Media Technologies, People, and Society

116X | Media Law |

125. Perspectives on American Journalism |

137. U.S. Communication Policy |

155. Interethnic Communication |

160. The Press and the Political Process |

183. Media Economics |

**CULTURAL AND SOCIAL ANTHROPOLOGY**

132. Science, Technology, and Gender |

**ECONOMICS**

116. American Economic History |

157. Imperfect Competition |

158. Antitrust and Regulation |

**EDUCATION**

203X. Education and Inequality in American Culture |

220B. Introduction to the Politics of Education |

**HISTORY**

52N. Stanford Introductory Seminar: The Atomic Bomb in Policy and History |

150B. Introduction to African-American History: The Modern Black Freedom Struggle |

262S. Undergraduate Research Seminar: Science and High Technology in Silicon Valley, 1930-1980 |

**HUMAN BIOLOGY**

102A. Children, Youth, and the Law |

125. Environmental Policy and Law |

131. Natural Resources Policy and Law |

160. Health Care in America |

160A. Seminar in American Health Care Policy |

**POLITICAL SCIENCE**

1. Introduction to Political Science |

10. American National Government and Politics |

60. The American Dream |

101P. Politics and Public Policy—(Same as Public Policy 101.) |

104. Seminar: Urban Policy |

134B. America and the World Economy |
ANTHROPOLOGICAL SCIENCES

Chair: William H. Durham
Consulting Assistant Professor: Nina Jablonski
Consulting Assistant Professor: Dominique Irvine
Visiting Associate Professor: Lawrence A. Hirschfeld
Affiliated Faculty: Carol Boggs, L. Luca Cavalli-Sforza, David Cox, Marcus W. Feldman, Henry Greely, Barbara Koenig, Ellen Porzig, Armin Rosencranz, Robert Sapolsky, Richard White
Fellows: Alec Knight, Flora Lu, Amanda Stronza

The Department of Anthropological Sciences (ANSI) takes as its subject matter the nature and evolution of our species. The department offers students training in archaeology, cultural anthropology, demography, ecology, environmental anthropology, evolutionary theory, genetics, linguistic anthropology, medical anthropology, paleoanthropology, and primatology. Specialties and interests of individual faculty members include applied anthropology, curing systems in western and non-western societies, ethics, gender, genetic and cultural evolution, historical linguistics and linguistic anthropology, human environments and adaptations, human origins, hunters and gatherers, materialism, molecular anthropology, social and psychological anthropology, and tools and technology. The department is united by a common interest in the interrelations of biology, culture, and environment, and by a commitment to a four-field, scientific approach to anthropology.

The departmental curriculum includes courses at three levels. These courses are designed to: (1) expose undergraduates to the theories, methods, and substance of the anthropological sciences; (2) provide undergraduate majors and minors with a program of work leading to the bachelor’s degree; and (3) prepare candidates for advanced degrees in the discipline. Students are also encouraged to pursue ethnographic area studies building on existing faculty research in Asia, Latin America, and North America.

The department offers an undergraduate Bachelor of Arts degree. Undergraduates may elect to specialize in any one of four concentration tracks: (1) Culture, Social Relations, and Language; (2) Archaeology and Evolutionary Studies; (3) Population and Environment; and (4) Medical Anthropology and Genetics. Within each of these concentration tracks, students work with their faculty adviser to design a course of study that includes at least one course from each of five areas of the “Human Evolution Framework” (described below): human nature and variation, human history and prehistory, human evolutionary processes and their interactions, cultural systems and cultural transmission, and laboratory and field methods. The framework is designed to ensure that students of all specializations receive a solid grounding in evolutionary thinking and analysis.

The department offers three graduate degrees: Master of Science, Master of Arts, and Doctor of Philosophy. The graduate curriculum encourages students to pursue individual interests and projects under the supervision of a faculty committee. The backbone of the graduate program is a department-wide Core Seminar devoted to ongoing discussion of issues and approaches in the anthropological sciences. An active Teaching Assistant training program, focused on students in the second year of the Ph.D. program, is an integral part of graduate training. The graduate program offers students a wide range of opportunities for training in theoretical and practical skills, including model-building, ethnographic methods, archaeological and osteological techniques, data analysis, computer imaging, laboratory methods in genetics, and a variety of field training options. At both the undergraduate and graduate levels, the curriculum emphasizes the use of scientific methodology.

The department also offers a variety of hands-on research and training opportunities, including research assistantships, internships on- and off-campus, an active undergraduate Honors program, and a series of field seminars with scholarships in the Amazon, the Andes, the American Southwest, Middle America, and Galapagos. Undergraduate and graduate students are encouraged to work with various faculty at their field sites each summer. The department maintains teaching and research collections in the Iris and B. Gerald Cantor Center for Visual Arts at Stanford University, featuring materials from the Americas, the Pacific Rim, and Africa. Under the “Pritzker Summer Scholars” program, the
department also awards a number of summer grants each year to undergraduates who are planning specialized study in Anthropological Sciences. The grants are of three kinds: (1) Training Grants, to help with the costs of summer field schools and training programs (applications in Spring Quarter); (2) Mentored Research Grants, to enable students to gain research experience by working on faculty research projects (application in Spring Quarter); and (3) Independent Research Grants, to facilitate summer research projects leading to Honors in Anthropological Sciences (application in Winter Quarter). In addition, students have the opportunity to participate in ongoing historical archaeology conducted on campus.

Note—The degree programs in the Department of Anthropological Sciences became available in the Autumn Quarter of 1999-2000. Current students who enrolled in 1998-99 or in any previous year have the option of finishing their degrees under the guidelines and requirements of the former Department of Anthropology (see, for example, Stanford Bulletin 1998-99), or they may opt for the new guidelines and requirements outlined here. The choice of these options should be made in writing, with the faculty adviser’s approval, and filed with the Student Services Coordinator in the Anthropological Sciences office.

UNDERGRADUATE PROGRAMS

The Department of Anthropological Sciences offers a Bachelor of Arts degree together with an Honors program and a minor. The Anthropological Sciences programs include active undergraduate advising (described below).

BACHELOR OF ARTS

The A.B. degree program in Anthropological Sciences gives students an understanding of the breadth and depth of anthropological knowledge, as well as a series of intellectual and practical tools. Majors choose from one of four concentration tracks: Language, Culture, and Social Relations; Archaeology and Evolutionary Studies; Population and Environment; and Medical Anthropology and Genetics. The A.B. in Anthropological Sciences provides solid preparation for careers in anthropology, business, economic development, education, foreign service, health professions, international relations, law, or public policy.

With the addition of courses from the natural, physical, and mathematical sciences, the A.B. degree also provides preparation for further study in a broad variety of scientific areas, including earth sciences, ecology and evolutionary biology, environmental sciences, human genetics, medicine, and psychology. The department is developing a Bachelor of Science degree; and provides guidance for undergraduate students who want to ensure a strong background in the natural and quantitative sciences as they earn an undergraduate Anthropological Sciences degree (see the Student Services Coordinator for details).

REQUIREMENTS

The department offers considerable flexibility in structuring an Anthropological Sciences major. In consultation with a faculty adviser, students develop a program that reflects their individual interests and needs. Majors in anthropological sciences meet with their advisers at least once every quarter. Each student’s progress toward fulfilling the major requirements is recorded in a departmental file. It is the student’s responsibility to see that this file is kept up to date.

All A.B. majors in the Department of Anthropological Sciences (ANSI) must fulfill the following requirements:

1. Course work equivalent to 65 units, with at least 45 units in Anthropological Sciences. The remaining 20 units may be taken in any of the related humanities, social science, and science departments and programs, including the Department of Cultural and Social Anthropology. Outside courses must form a coherent program of study and must be approved by the student’s adviser. Up to 10 of the 65 units may be in Directed Individual Study.

2. Complete ANSI 2A and 2B (Human Biology 2A and 2B), or three other “Introductory Courses” as listed below.

3. Complete at least one course in each of the four traditional subfields of anthropology: archeological, biological anthropology, linguistic, and sociocultural.

4. A letter grade of ‘B’ or better in the theory course, History of Theory in Anthropological Sciences (ANSI 190). This course fulfills the University’s Writing in the Major Requirement (WIM) and should be taken no later than the junior year.

5. Declare a concentration track and complete at least 25 units in that track.

6. Complete at least one course from each of the five Human Evolution Framework (HEF) areas below, including lab and field methods. Note that some courses satisfy multiple areas of the HEF.

7. Complete at least one foreign language course at the second-year level with a letter grade of ‘B’ or better. This requirement may also be met by special examination, presentation of superior foreign language placement scores, or certification in writing from an appropriate department.

8. Complete at least one course in statistics (ANSI 192, Biological Sciences 141, Psychology 60, Statistics 60, or equivalent).

CONCENTRATION TRACKS

Concentration tracks are designed to encourage students to acquire in-depth knowledge and training. Undergraduates in the major program may elect to specialize in one of the four tracks described below. Alternatively, students may design their own specialization(s) with the guidance of a faculty adviser. Each student is required to complete 25 units within the chosen track. With consent of their faculty adviser, students may replace one course with a relevant course offered by another department. The 25 units count towards the total of 65 units required for the major.

Culture, Social Relations, and Language (Track 1)—Emphasizes the unity and diversity of contemporary social, cultural, and linguistic systems. Course offerings include culture and social theory, family, gender, kinship, linguistic anthropology, and political economy. Ethnographic area studies are strongly encouraged for students who choose this track.

Archaeology and Evolutionary Studies (Track 2)—Features primate evolution, human origins and prehistory, and the development of human societies from early hunter-gatherers through complex civilizations. Students choose from courses in anthropological genetics, archaeology, evolutionary theory, historical linguistics, paleoanthropology, and primatology.

Population and Environment (Track 3)—Explores mutual relationships between human populations and their environments. Biocultural adaptations of human societies to diverse environments are examined, as are the causes and consequences of human impact upon local and global environments. Students choose from courses in behavioral ecology, demography, ecological and environmental anthropology, and selected area studies.

Medical Anthropology and Genetics (Track 4)—Examines human biological and cultural variation from a variety of perspectives. Within medical anthropology, the focus is on the social, cultural, and genetic correlates of physical and mental health, as well as disease. In anthropological genetics, students explore the extent, origins, and impact of variation among human genomes. Students choose from courses in epigenetics, genetics, and medical anthropology.

HUMAN EVOLUTION FRAMEWORK (HEF)

Crossing-cutting these concentration tracks is an evolutionary framework designed to familiarize students with the tools of analysis in anthropological sciences. The department divides this framework into five essential components (HEF I-V) as outlined below. Regardless of the concentration track, students are required to take at least one course in each of these component areas. Many courses offered by the department satisfy one or more of these requirements as shown by the HEF designations under “Courses” below.

Human Nature and Variation: Past and Present (HEF I)—Biological nature and variation
Cultural nature and variation
Language capability and linguistic variation
Human universals, human differences

*Human History and Prehistory: Inferring Events of the Past* (HEF II)
- Population events: movements, splits, admixture, extinctions
- Environmental events: changes in climate, resources, disease
- Species events: adaptation, speciation, species extinction
- Social and cultural events: changes in technology, settlement, language, and social organization

*Evolutionary Processes and their Interactions* (HEF III)
- Molecular evolution, population genetics, and speciation
- Cultural and linguistic evolution, ethnohistory, social evolution
- Causes and consequences of environmental change
- Interactions of genetic, cultural, and social evolution

*Cultural Systems and Cultural Transmission* (HEF IV)
- Systemic properties of culture and language
- Transmission of culture in space and time
- Cultural ontogeny and socialization
- Relationship between individual, society, and culture

*Labor and Field Methods: Tools for the Anthropological Sciences* (HEF V)
- Laboratory and field methods
- Ethnographic methods
- Data analysis
- Computational models and methods

### Declaring a Major
To declare an Anthropological Sciences major, students should first discuss their ideas and plans with one or more department faculty, and with at least one peer adviser. When they have a good working plan on paper (forms are available from the Student Affairs Coordinator) for their course of study, they must then fill out the Declaration of Major form in the Registrar's Office, obtain the signature of their student and faculty advisers, and contact the department's Student Services Coordinator who will review the degree requirements and give general guidance. It may be helpful for students to meet with the chair of the department's Student Affairs Committee for initial academic advising and assistance in choosing an appropriate adviser in the department. Students must complete the declaration process (including the signature of their Anthropological Sciences adviser) no later than the last day of the quarter, two quarters prior to degree conferment (Autumn Quarter if Spring graduation is planned).

Undergraduates are actively encouraged to take advantage of funding opportunities to carry out independent research. Funding for undergraduate research is available from Undergraduate Research Opportunities (URO) grants, affiliated area studies programs (for example, Latin American Studies), and the department's own Pritzker Summer Scholars Program described above. Information and applications for the latter are available from the Academic and Student Services Coordinator in the department office.

### Advising Program
The department puts high priority on undergraduate advising. Each student works with one or more peer advisers, as well as a faculty adviser, to design and carry out their Anthropological Sciences major or minor. The advising program is built on a faculty mentoring approach, and to help students develop a good working relationship with at least one faculty member. Students are expected to meet regularly, and for at least two hours per quarter, with their faculty adviser to discuss their progress and to review course selection, research opportunities, graduate or professional schools, and career planning. Peer advisers are the first step in seeking advice; they keep regular hours in the peer advising office in the department.

### MINORS

*Declaring a Minor*—The department offers flexibility in structuring an Anthropological Sciences minor. In consultation with both peer and faculty advisers, students develop a minor that reflects their individual interests and needs. Prospective Anthropological Sciences minors should request an Anthropological Sciences Minor Planning Form and Checklist from the department's Academic and Student Services Coordinator. All minors in the Department of Anthropological Sciences must fulfill the following four requirements:

1. Selection of an Anthropological Sciences faculty adviser and approval of the minor courses by both peer and faculty advisers.
2. Completion of 30 units of course work in Anthropological Sciences with a grade point average (GPA) of 'B+' or better. With the adviser's approval, up to 15 units of required 30 units may be taken in Cultural and Social Anthropology or other social science departments at Stanford. No more than 10 of the 30 units may be taken for an instructor-elected Satisfactory/No Credit grade. Student-elected Satisfactory/No Credit units are not allowed.
3. Completion of ANS12A and 2B (Human Biology 2A and 2B) or three courses from introductory offerings.
4. Completion of at least one course at the 100 level or higher. Note: Human Biology majors who minor in ANSI cannot double count Human Biology 2A and 2B, and must then take 30 units of ANSI course work other than 2A and 2B.

### HONORS
The Honors Program in Anthropological Sciences provides students the opportunity to conduct original research under the guidance of a faculty adviser. Candidates of sophomore and junior standing should submit an application to the student program coordinator no later than the end of the fourth week of the Spring Quarter. It must include a brief statement of a proposed honors project, a complete course of study within Anthropological Sciences, a transcript, and written approval of a faculty sponsor. The Student Affairs Committee reviews applications and notifies accepted students.

Candidates whose application to the honors program has been approved by the Student Affairs Committee must complete all of the requirements for their major and submit an honors thesis no later than three weeks prior to the end of the quarter in which graduation is anticipated. The thesis is read by the candidate's adviser and a second reader.

Students interested in honors are especially encouraged to apply for summer research funding through the department, through the office of Undergraduate Research Opportunities (URO), and through the various area studies centers on campus (for example, African and African American Studies, Latin American Studies, and so on). In most cases, honors students apply for such funding no later than Spring Quarter of their junior year.

### COTERMINAL DEGREES
The Department of Anthropological Sciences accepts applications from Stanford undergraduates to work toward coterminal A.M. or M.S. degrees. Undergraduate students with a grade point average (GPA) of 3.0 or higher may apply between their seventh and eleventh years at Stanford. No more than 10 of the 30 units may be taken for an instructor-elected Satisfactory/No Credit grade. Student-elected Satisfactory/No Credit units are not allowed.

### GRADUATE PROGRAMS
University requirements for the degrees of Master of Arts, Master of Science, and Doctor of Philosophy are described in the “Graduate Degrees” section of this bulletin.

The department offers three graduate degrees: Master of Science, Master of Arts, and Doctor of Philosophy. The graduate curriculum encourages students to pursue individual interests and projects under the supervision of a faculty committee. Specific details of the graduate programs in Anthropological Sciences are outlined in the departmental Graduate Handbooks (available in the department office).

### MASTER OF ARTS
The Department of Anthropological Sciences offers the A.M. degree to four groups of students: Stanford undergraduates who enroll in the
DOCTOR OF PHILOSOPHY

Prospective graduate students should request application materials from Graduate Admissions in the Registrar’s Office. The deadline for applications is January 1. The Graduate Record Exam (GRE) is required. Successful applicants for the Ph.D. program may enter only in Autumn Quarter.

REQUIREMENTS

Requirements 1-9 must be completed within the first two years:

1. Within the first two years, complete 67 units of course work for a letter grade, while maintaining a grade point average (GPA) of 'B+' or better. Of these 67 units, at least 40 units must come from graduate-level courses within the department. The remaining 27 units may include advanced undergraduate courses as well as courses from related humanities, social science, and science departments and programs, including the Department of Cultural and Social Anthropology. Outside courses must form a coherent program of study and be approved by the student’s adviser.

2. Enroll in the departmental Core Seminar (ANSI 290) each quarter while in residence. First year students are expected to enroll in the Core Seminar for a minimum of 3 units per term.

3. Complete Data Analysis in the Anthropological Sciences (ANSI 292), both for a letter grade. Units earned in this course count toward the 45-unit A.M. requirement.

4. Enroll in the departmental Core Seminar (ANSI 290) each quarter while in residence. First year students are expected to enroll in the Core Seminar for a minimum of 3 units per term.

5. Complete Data Analysis in the Anthropological Sciences (ANSI 292) for a letter grade. Units earned in this course count toward the 45-unit M.S. requirement.

6. Students must submit a professional-quality field or library research paper to be read and approved by at least two department faculty members.

7. For those whose native language is English, pass an examination in a language other than English that will either serve as a field or research requirement. Of these 67 units, at least 40 units must come from graduate-level courses within the department. The remaining 27 units may include advanced undergraduate courses as well as courses from related humanities, social science, and science departments and programs, including the Department of Cultural and Social Anthropology. Outside courses must form a coherent program of study and be approved by the student’s adviser.

8. Serve as a teaching assistant for three undergraduate courses. In preparation for this responsibility, students are expected to take part in the departmental Teaching Assistant Training Program organized each year. (Students can petition to substitute an internship or research assistantship for one quarter as a TA.)

9. Petition for and advance to candidacy by the end of the second year. After successful completion of the first two years of the program, and after an accepted petition for doctoral candidacy, advanced graduate students are required to complete the following:

   1. Pass a special examination (written and oral). This examination fulfills the requirement of the University oral examination and may be scheduled at any time during the third year that is directly following admission to candidacy.

   2. Submit the Doctoral Dissertation Reading Committee form before approval of TGR status or before scheduling a University oral examination that is in defense of a dissertation. The reading committee is to be recruited no later than the end of the third year.

   3. Take at least one quarter of Proposal Writing (ANSI 294) and prepare a dissertation proposal to be approved by the dissertation reading committee before the end of the Spring Quarter of the third year. If necessary, obtain Human Subjects clearance.

   4. Take at least one quarter of Dissertation Writing (ANSI 298) and complete an approved dissertation based on independent research.

   5. Give a public presentation of the dissertation in the department.

COTERMINAL PROGRAM

Stanford graduate students taking advanced degrees in other departments or schools at Stanford; Ph.D. students in Anthropological Sciences who fulfill the A.M. requirements in the course of their work toward the Ph.D. degree, and students who apply from outside of Stanford for entry into the terminal A.M. program.

REQUIREMENTS

1. Graduate enrollment at Stanford for at least three quarters of full tuition.

2. At least 45 units of course work for a letter grade (in addition to any pertinent undergraduate courses), with at least 30 units in Anthropological Sciences. The remaining 15 units may be taken from related humanities, social science, and science departments and programs, including the Department of Cultural and Social Anthropology. Outside courses must be approved by the student’s adviser and must form a coherent program of study. No more than 10 of the 45 units may be in Directed Individual Study. Students must maintain a grade point average (GPA) of 'B' or better.

3. At least four graduate-level courses, other than “Special Courses,” in Anthropological Sciences, all for a letter grade. The remaining units may be made up of courses selected in consultation with the student's faculty adviser.

4. Enroll in the departmental Core Seminar (ANSI 290) each quarter while in residence. First year students are expected to enroll in the Core Seminar for a minimum of 3 units per term.

5. Complete Data Analysis in the Anthropological Sciences (ANSI 292) for a letter grade. Units earned in this course count toward the 45-unit A.M. requirement.

6. Students must submit a professional-quality field or library research paper to be read and approved by at least two department faculty members.

MAJOR OF SCIENCE

The Department of Anthropological Sciences offers the M.S. degree to four groups of students: Stanford undergraduate science majors who enroll in the coterminal program; Stanford graduate students taking advanced degrees in other departments or schools at Stanford; Ph.D. students in Anthropological Sciences who fulfill the M.S. requirements in the course of their work toward the Ph.D. degree, and students who apply from outside of Stanford for entry into the terminal M.S. program. Students applying to the M.S. program must have a B.S. degree.

REQUIREMENTS

1. Graduate enrollment at Stanford for at least three quarters of full tuition.

2. At least 45 units of course work for a letter grade (in addition to any pertinent undergraduate courses), with at least 30 units in Anthropological Sciences. The remaining 15 units may be taken from related humanities, social science, and science departments and programs, including the Department of Cultural and Social Anthropology. Outside courses must be approved by the student’s adviser and must form a coherent program of study. No more than 10 of the 45 units may be in Directed Individual Study. Students must maintain a grade point average (GPA) of 'B' or better.

3. At least four graduate-level courses, other than “Special Courses,” in Anthropological Sciences, all for a letter grade. The remaining units may be made up of courses selected in consultation with the student’s faculty adviser.

4. Enroll in the departmental Core Seminar (ANSI 290) each quarter while in residence. First year students are expected to enroll in the Core Seminar for a minimum of 3 units per term.

5. Complete Data Analysis in the Anthropological Sciences (ANSI 292) for a letter grade. Units earned in this course count toward the 45-unit M.S. requirement.

6. Students must submit a professional-quality field or library research paper to be read and approved by at least two department faculty members.

7. For those whose native language is English, pass an examination in a language other than English that will either serve as a field or research requirement. Of these 67 units, at least 40 units must come from graduate-level courses within the department. The remaining 27 units may include advanced undergraduate courses as well as courses from related humanities, social science, and science departments and programs, including the Department of Cultural and Social Anthropology. Outside courses must form a coherent program of study and be approved by the student’s adviser.

8. Serve as a teaching assistant for three undergraduate courses. In preparation for this responsibility, students are expected to take part in the departmental Teaching Assistant Training Program organized each year. (Students can petition to substitute an internship or research assistantship for one quarter as a TA.)

9. Petition for and advance to candidacy by the end of the second year. After successful completion of the first two years of the program, and after an accepted petition for doctoral candidacy, advanced graduate students are required to complete the following:

   1. Pass a special examination (written and oral). This examination fulfills the requirement of the University oral examination and may be scheduled at any time during the third year that is directly following admission to candidacy.

   2. Submit the Doctoral Dissertation Reading Committee form before approval of TGR status or before scheduling a University oral examination that is in defense of a dissertation. The reading committee is to be recruited no later than the end of the third year.

   3. Take at least one quarter of Proposal Writing (ANSI 294) and prepare a dissertation proposal to be approved by the dissertation reading committee before the end of the Spring Quarter of the third year. If necessary, obtain Human Subjects clearance.

   4. Take at least one quarter of Dissertation Writing (ANSI 298) and complete an approved dissertation based on independent research.

   5. Give a public presentation of the dissertation in the department.
Financial Support—The department endeavors to provide needed financial support (through fellowships, teaching and research assistantships, and tuition grants) to all students admitted to the Ph.D. program who maintain satisfactory progress. First-year students in the Ph.D. program who have not entered with outside funding are required to apply for such funding during their first quarter. See Guide to the Ph.D. Program in Anthropological Sciences and the department website (http://www.stanford.edu/dept/anthsci) for details.

Ph.D. MINOR

The requirements for a Ph.D. minor in Anthropological Sciences are the following:

1. Enlist a faculty member of Department of Anthropological Sciences who will consent to serve as the adviser for the minor.
2. Submit an application for admission to the Ph.D. minor to the Department of Anthropological Sciences. The completed application must include the written consent of the adviser. The application and any associated instructions should be obtained from the department’s Student Program Coordinator.
3. Complete 27 units of courses in the Department of Anthropological Sciences at Stanford for letter grades in courses for which letter grades are offered, with a grade average of ‘B’ or better. The University Ph.D. minor requirements state that 20 of these units must be in courses numbered 200 or above, and that course work for the minor cannot also be used to meet the requirements for a master’s degree. Of the additional 7 units, 2 are to be taken in conjunction with the department’s Core Seminar (ANSI 290*) and the additional 5 units are not restricted as to course number.
4. In conjunction with the adviser, determine a coherent course of study related to the student’s interests. Among the 27 units of required Anthropological Sciences courses, the student must take either ANSI 190, 201 A, or 201 B, and must enroll in the department’s Core Seminar (ANSI 290) for at least two quarters, at a minimum of 1 unit per quarter. No more than 10 of the 27 units can be Individual Study or Independent Research. No more than 15 of the 27 units can be counted from courses taken before submission of the application for admission to the Ph.D. minor, and these 15 or fewer only with the approval of the adviser.
5. It is expected that the student’s adviser will participate as a representative of the department at the student’s University Ph.D. oral examination. The student is responsible for this arrangement with the major department.
6. For graduation, complete all necessary paperwork with the department’s student program coordinator.

* The required Core Seminar (ANSI 290) is given for credit only.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

Undergraduate Anthropological Sciences courses 130 and above are organized by concentration tracks, 1 to 4 (see above). (HEF) designations indicate the given course satisfies requirement I, II, III, IV, or V of the Human Evolution Framework, also described above. A course may satisfy more than one HEF requirement.

NUMBERING SYSTEM

Anthropological Sciences courses are numbered according to the following scheme:

01-99 Introductory Courses
01-19 General Introductory Courses
20-29 SIS Courses (freshmen preference)
30-39 SIS Seminars and Dialogues (sophomore preference)
100-129 Culture, Social Relations, and Language
100-109 Culture and Social Relations
110-119 Language
120-124 Area Studies: The Americas
125-129 Area Studies: Asia
130-149 Archeology and Evolutionary Studies
130-139 Evolutionary Studies
140-149 Archeology
150-169 Population and Environment
150-159 Population/Demography
160-169 Environment/Ecology
170-189 Medical Anthropology and Genetics
170-179 Medical Anthropology
180-189 Anthropological Genetics
190-199 Special Courses
200-299 Graduate-level Courses

INTRODUCTORY

Intended to serve as an introduction to the methods, theories, and substance of Anthropological Sciences, introductory courses are for both majors and non-majors. ANSI 2A and 2B (Human Biology 2A and 2B) provide a good introduction to the major; alternatively, a student may take three other Introductory Courses numbered from 3 to 40.

2A. Genetics, Evolution, and Ecology—(Enroll in Human Biology 2A.)
5 units, Aut (Boggs)

2B. Culture, Evolution, and Society—(Enroll in Human Biology 2B.)
5 units, Aut (Klein)

3. Introduction to Prehistoric Archaeology—Aims, methods, and data in the study of human society’s development from early hunters through late pre-historic civilizations. Archaeological sites and remains characteristic of the stages of cultural development are examined for selected geographic areas, emphasizing methods of data collection and analysis appropriate to each. GER:3b, 4a (DR:2 or 9)
3-5 units, Aut (Rick)

4. Language and Culture—Language variants (dialects, registers, jargons, writing, and non-verbal systems) and their use. Language classification and human prehistory. Linguistic determinism, relativism, encodability, and the cultural origins of vocabulary and grammar. The structure of discourse, including conversation, narrative, and poetics. Language, gender, and power. Style, strategy, and ideology in language use. Emphasis is on the comparative reading of monographic studies of language and culture in particular societies.
4-5 units (Fox) not given 2000-01

5. The Biology and Evolution of Language—Language as an evolutionary adaptation of humans. Comparison of communicative behavior in humans and animals, and the inference of evolutionary stages. Structure, linguistic functions, and the evolution of the vocal tract, ear, and brain, with associated disorders (stuttering, dyslexia, autism, schizophrenia) and therapies. Controversies over language “centers” in the brain and the innateness of language acquisition. Vision, color terminology, and biological explanation in linguistic theory.
4-5 units (Fox) not given 2000-01

6. Human Origins—The human fossil record from the first non-human primates in the late Cretaceous or early Paleocene, 80-65 million years ago, to the anatomically modern people in the late Pleistocene, between 100,000 to 50,000 B.C. Emphasis is on broad evolutionary trends and on the natural selective forces behind them. GER:2a (DR:5)
5 units, Win (Klein)

7. Marriage and Kinship—Surveys the variation in human kinship systems, asking whether or not they can be understood as evolutionary products, and considers the contribution to be made by a Marxist perspective. Eurasia and Africa are contrasted with Europe and E. Asia. GER:3b, 4c (DR:9)
5 units, Win (Wolf)
5 units, Win (Mountain)

9. Human Environments and Adaptations—The relationship between diverse human populations and their environments. Theories for how environments influence human behavior and culture, and for how human populations shape their environments. Emphasis is on present-day environmental problems and the human dimensions. How the social and cultural processes can cause environmental problems (e.g., deforestation, soil erosion, habitat degradation), and help to solve them.
3-5 units (Staff) not given 2000-01

STANFORD INTRODUCTORY SEMINARS (SIS)
The SIS program within the Department of Anthropological Sciences provides opportunities for first- (N) and second-year (Q) students to work closely with faculty. Units for these courses count towards the Anthropological Sciences major requirements.

20N. Stanford Introductory Seminar: Modern Human Origins—Preference to freshmen. Analysis of the data and theories bearing on the origins of anatomically modern humans between 1,000,000 and 50,000 years ago. Emphasis is on the two major contending theories: that modern humans originated more or less simultaneously from non-modern humans in many regions of Africa and Eurasia; or that modern humans originated exclusively in Africa and spread from there. How paleontologists test these theories against the empirical data of genetics and the fossil record.
3 units, Spr (Klein)

23N. Stanford Introductory Seminar: Maya Mythology Multimedia Project—Preference to freshmen. Lectures, discussions, and hands-on work in the development of a world-wide web project on the mythology of the ancient and modern Maya, emphasizing the relationships between the Quiche mythological text, Popol Vuh, and ancient Maya art and archaeology, hieroglyphic texts, colonial documents, modern ethnography, modern Maya narrative language, and mythological theory. GER:3b (DR:9)
3 units, Win (Fox)

31Q. Stanford Introductory Seminar: Earthquakes and Archaeology in the Eastern Mediterranean—Lectures and Field Trip—(Enroll in Geophysics 50Q.)
3 units, Win (Nur)

CULTURE, SOCIAL RELATIONS, AND LANGUAGE
In addition to the courses listed directly below, ANSI courses 165 and 170, listed in other concentration tracks, also count towards the Track 1 concentration.

CULTURE AND SOCIAL RELATIONS
102. Women, Fertility, and Work—Is gender culturally or biologically determined or both? The arguments for sociobiological and cultural determinist explanations of the differences between women and men are compared, emphasizing their intersection in work. Case studies: gatherer/hunter, horticultural (Melanesian), southern Chinese, and Anglo-American societies. HEF I, IV GER:4c (DR:†)
5 units (Gates) not given 2000-01

103. Theory and Method in Cultural Evolution—(Graduate students register for 203.) The concept of culture as used in anthropology, and the ways in which culture is socially conveyed and manipulated. The capacity for "descent with modification" in cultural systems. Critical examination of transmission forces, direct and indirect bias, epigenetic theory, cultural selection, gene-culture coevolution, and ethnogenesis. HEF III, IV
5 units (Durham) not given 2000-01

104. The Anthropology of Childhood—Children do not think, talk, or act as adults do. Anthropology studies population differences in thought, language, and behavior. The overlooked convergence of these two observations, examining how cultural differences in child rearing and the conceptualization of childhood across time and space affect child development.
5 units, Aut (Hirschfeld)

105. Race, Gender, and Biology—Critically evaluates the biological arguments for the explanation of race and gender inequality in human societies. The history of the issues, examining the arguments of proponents (to the effect that race and sex role differences are rooted in our biology) and the arguments of their critics. Recent arguments, including those of sociobiology and its critics, because of their influence on contemporary social thought. HEF I
5 units (Durham) not given 2000-01

106. Human Origins in Science and Myth—A comparison of peoples' accounts of their own and others origins, with inferences made from comparative biological, linguistic, and cultural data. Functional, psychological, historical, folkloristic, and literary interpretations of myths and other narratives of origin. The scientific account as narrative. The intellectual accomplishments of supposedly primitive and advanced cultures, asking whether their cognitive models of time, space, and the cosmos justify such differentiation. (HEF IV)
5 units (Fox) not given 2000-01

107. Culture and Cognition—(Graduate students register for 207; same as Psychology 278.) Theories of culture make strong claims about how people represent the world to themselves and others, particularly claims about perception, memory, and reasoning. The basic anthropological assumptions about cultural knowledge (e.g., that members of different cultures deploy incommensurate world views) in light of recent advances in cognitive science, and how well characterizations of thinking and reasoning hold up in a cross-cultural perspective. Enrollment limited to 20.
5 units, Aut (Hirschfeld)

108. The Cultural Politics of Race and Ethnicity—Research on race and ethnicity by cultural anthropologists, historians, and historical sociologists is often independent of (and at times in counterpoint to) research on prejudice, stereotyping, and bias in psychology. The development of both lines of research, appraising them with respect to each other and toward a reconciliation of these approaches to a common theme. Enrollment limited to 10.
5 units, Win (Hirschfeld)

LANGUAGE
110. Introduction to Language Change—Variation and change as the natural state of language. Differentiation of dialects and languages over time. Determination and classification of historical relationships among languages, and reconstruction of ancestral stages. Types, rates, and explanations of change. Parallels with cultural and genetic evolutionary theory. Implications for the description and explanation of language in general. (HEF II, III) GER:3b (DR:9)
4-5 units, Win (Fox)
111. Language and Prehistory—Language classification and its implications for human prehistory. The role of linguistic data in analyzing prehistoric populations, cultures, contact, and migrations. Comparison of linguistic and biological classifications. Semantic reconstruction, proto-vocabularies, and culture. Archaeological decipherment, the origins and evolution of writing, and the relationships between writing, culture, and civilization. (HEF II, III)
5 units (Fox) not given 2000-01

112. Human Diversity: A Linguistic Perspective—The diversity and distribution of human language and its implications for the origin and evolution of the human species. The origin of existing languages and the people who speak them. Where did the languages that we currently see in the world come from and how can this diversity be used to study human prehistory? Evidence from related fields (archaeology and human genetics). Topics: the origin of the Indo-European languages, the peopling of the Americas, and the evidence that all human languages share a common origin.
5 units, Spr (Ruhlen)

115. Maya Hieroglyphic Writing—(Graduate students register for 215.) Lecture/workshop on the decipherment of the hieroglyphic writing of the Classic Maya. Principles of archeological decipherment. Analysis of Maya calendrical, astronomical, political, and religious/mythological texts on stone, wood, bone, shell, ceramic vessels, and screenfold books. Ancient Maya scribal practice and literacy. The origins of Maya writing and related Mesoamerican writing systems. The impact of epigraphy on the archeology and linguistics of the Maya.
5 units, Spr (Fox)

119. Linguistic Field Methods—Practical training in the collection and analysis of linguistic data from native speakers. Research goals, ethics, working in the community, technical equipment, and analytical strategies. Emphasis is on the use of computers in the collection, analysis, and preparation of materials useful to the subject community. Prerequisite: introductory linguistics. (HEF V)
5 units (Fox) not given 2000-01

120. Native American Cultures of North America—Introduction to the diverse cultures of indigenous peoples in N. America before the European conquest. Lectures, readings, and films on the precontact situation, postcontact changes (including government policies), influences of Indian culture on American society and culture, and the contemporary situation of native peoples. An antidote to TV and Western movie stereotypes. (HEF IV) GER:4b (DR:3)
5 units (Barnett) not given 2000-01

121. Native Peoples and Cultures of the Southwest—The development of the rich, varied cultures of the American southwest from earliest prehistory to postmodern times. Emphasis is on the interaction of cultures and their responses to changes in social and natural environments. Recommended: background in Native American cultures, literature, and archaeology. (HEF IV)
5 units (Barnett, Rick) not given 2000-01

122. The Maya—Introduction to the archaeology and culture of the ancient and modern Maya. Archaeological and historical data and classification of periods and variation in Maya culture. The natural world of the Maya: environmental, food, agriculture, technology, and medicine. The life cycle and daily life, power and social structure, language and writing, mythology, time, astronomy, religion, and art. The Spanish conquest and the colonial Maya. The Maya in the modern world system. (HEF II, IV)
5 units (Fox) not given 2000-01

123. Environmental Issues in the Americas—Focus is on the local impacts of major environmental problems in the Americas. Case studies: deforestation of tropical rainforest in the Amazon; co-management of marine fauna in the Arctic; forestry management in Mexico and N. America; and pollution, toxic waste, and environmental justice in the U.S. (HEF III)
5 units (Staff) not given 2000-01

124. Perspectives on Sustainable Development in Latin America—(Same as Latin American Studies 195.) Cross-disciplinary examination of perspectives for "sustainable development" in rural areas of Latin America. Interactions between poverty, development, environmental degradation, and approaches to growth and stability in agroecology, agroforestry, small farm development, and conservation biology. Limited enrollment. HEB III
5 units, Win (Rosset)

AREA STUDIES: ASIA

125A. 20th-Century Chinese Societies—Nationalist China, the People's Republic of China, Taiwan, and the loosely-knit networks of the overseas Chinese are examined through the anthropological methods used in exploring complex societies. Emphasis is on political-economic, demographic, social organizational, gender/kinship, ideological, and transformative aspects of Chinese populations after the 1949 revolution. (HEF IV) GER:3b,4a (DR:2 or 9)
5 units, Spr (Gates, Wolf)

125B. Late Imperial China—Chinese civilization in the late imperial era (960-1911) in its spatial, temporal, structural, institutional, and ideational complexity. Thematic foci: frontiers and empire building, the making of Han Chinese and "barbarians," migrations, colonization, urban and rural living, imperial state and local government, commerce and petty capitalism, kinship and family, gender and marriage, food, money, population, and popular religion. (HEF IV) GER:4a (DR:2)
5 units, Aut (Gates, Wolf)

126. Formosa: An Introduction to Taiwanese History, Culture, and Society—Introduces the history, cultures, and society of Taiwan behind and beyond the headlines: the Dutch Period, the Japanese colonial era, the present day. The social scientific, especially anthropological, scholarship done on Taiwan in the past few decades. Topics: migration, trade, colonization, Han Chinese and the Taiwanese aborigines, social movements, nationalism, political culture, family and kinship.
3-5 units, Spr (Chau)


ARCHEOLOGY AND EVOLUTIONARY STUDIES

In addition to the courses listed directly below, ANSI courses 111, 112, 122A, 180, and 181, listed in other concentration tracks, also count towards the Track 2 concentration.

EVOLUTIONARY STUDIES

130. Modern Human Origins—Analysis of the data and theories bearing on the origins of anatomically modern humans between 100,000 and 50,000 years ago. Emphasis is on the two major competing theories: that modern humans originated more or less simultaneously from non-modern humans in many regions of Africa and Eurasia; or that modern humans originated exclusively in Africa and spread from there, largely replacing non-modern humans elsewhere. (HEF I, II)
5 units (Klein) not given 2000-01

131A. Primate Evolution—(Graduate students register for 231A.) The fossil, molecular, and anatomical data on primate origins, from their mammalian ancestors to the origin of the hominids. The adaptive radiations of lemurs, lorises, tarsiers, New World Monkeys, Old World Monkeys, lesser apes, and great apes. The functional anatomy of primates in relation to habitat and social ecology. (HEF II)
5 units, Spr (Jablonski)
131B. Primate Societies—(Graduate students register for 231B.) Introduction to primatology. Survey of the living primates, primate evolution, distribution, and taxonomy. Life history patterns, dominance hierarchies, reproductive strategies, and social structures. Focus is on cultural behaviors, including tool manufacture and use, language and communication, hunting and warfare, and political behavior. Analysis of current conservation issues. (HEF II)
5 units, Win (Maggioncalda)

131C. Evolution of Primate Intelligence—(Graduate students register for 231C.) Upper-level seminar on the evolution of cognitive abilities in primates. Analysis of selective forces increasing intelligence: from ecological factors impacting early primate species to social and cultural factors affecting hominid evolution. Critical evaluation of hypotheses about relationships between brain morphology and intelligence in humans, nonhuman primates, and hominid ancestors. Prerequisite: 131B or consent of instructor. (HEF V)
5 units, Win (Maggioncalda)

132. Hormones and Behavior—Seminar on primate socioendocrinology. The endocrine correlates of behavior and the behavioral correlates of changes in hormone levels. In-depth analysis of pheromones and other socioendocrine signals and their role in suppression of growth, development, and/or reproduction. The relationship between social rank and endocrine physiology. The evolutionary significance of interactions between social behavior and hormones. Prerequisites: 2A, 2B, 102, or Biological Sciences 150. (HEF I)
5 units (Maggioncalda) not given 2000-01

133A. Beginning Osteology—(Graduate students register for 233A; same as Human Biology 180.) Introduction to the study of the human skeletal system. The biology of the bone: growth and development, structure, and function. Identification of the different bones in the human skeletal system. Methods for assessing age, sex, and the biological affinity of bones from archaeological and paleontological contexts. (HEF I, V) GER:2A (DR:5)
5 units, Aut (Maggioncalda)

133B. Advanced Osteology—(Graduate students register for 233B.) Analysis of human bone remains from archaeological and paleontological sites. In-depth analysis of fragmentary skeletal remains from an archaeological site prior to their reburial. Morphometric measurements and observations of various skeletal elements, and assessment of age, sex, and pathological condition of individual specimens. Cultural influences on skeletal variability, and the assessment of prehistoric population dynamics. (HEF II, V)
5 units, Win (Staff)

134. Human Behavioral Biology—(Enroll in Biological Sciences 150/250.)
6 units (Sapolsky) alternate years, given 2001-02

135. Human Nature in Evolutionary Perspective—Examines selected examples of human behavior (incest avoidance, aggression, attachment, color symbolism, interpretation of facial expressions, etc.), considering the extent to which they are products of our evolutionary heritage. Prerequisites: 2A, 2B, upper-division standing. (HEF I)
5 units (Wolf) not given 2000-01

136. The Human Hand: Evolution, Ontogeny, and Influence—(Enroll in Human Biology 101.)
3 units (Porzig) not given 2000-01

137. Darwin, Evolution, and Galapagos—(Same as Human Biology 161.) Seminar on Darwinian theory as applied to the evolution of flora and fauna on the Galapagos Islands. Darwin’s observations in Galapagos, and their role in the formulation of his theory of evolution; recent research in Galapagos and its implications for our understanding of evolution today. The impact of human activity in Galapagos and emerg-
151. Demography in Anthropology—The study of vital rates in human populations and their social and cultural contexts. Population dynamics in small, non-state societies as contrasted with population dynamics in large industrial states. Emphasis is on the cause of high rates of fertility, mortality, and migration. Introduces demographic methods. (HEF II, V)

5 units (Staff) not given 2000-01

153. The Population Question: From Malthus to Rio—The relationship between the vital rates of human populations (fertility, mortality, and migration) and the social and ecological problems of poverty, hunger, and environmental degradation. To what extent is population growth (and attendant vital rates) the cause of these social ills? To what extent is population growth their consequence? What are the main interactions among social, cultural, ecological, and demographic variables? (HEF II)

3-5 units (Durham) not given 2000-01

154. The Limits to Growth—The past, present, and future of human population growth. Critically evaluates estimates of global and regional carrying capacity and their assumptions, including estimates based upon food, water, energy, and security considerations. Issues raised by inequity, over-consumption, and the role of culture in the history of human populations. The major choices humanity faces in the decades ahead. (HEF II)

3-5 units (Durham) not given 2000-01

156. Colloquium on Population Studies—(Enroll in Biological Sciences 146.)

1 unit, Win (Feldman)


4 units (Staff) not given 2000-01

ENVIRONMENT/ECOLOGY

160. Development and Environment—The cultural and environmental impacts of development projects, focusing on the local level impact of government initiatives to encourage economic development. The role of NGOs in negotiating development priorities and environmental protections. (HEF II)

5 units (Staff) not given 2000-01

161A. Conservation and Development Issues in the Amazon—The prospects for achieving the dual goals of biodiversity conservation and community development in Amazonia. Case studies of recent efforts at biodiversity conservation, including national parks, biosphere reserves, pharmaceutical prospecting, ecotourism, extractive reserves, and agroforestry projects. The costs and benefits of conservation. To whom do these costs and benefits accrue? Critically evaluates Integrated Conservation-Development Projects (ICDPs) in the Amazon today. Optional field trip over Spring Break (at added expense, limited capacity) to selected ICDPs in the Peruvian Amazon. (HEF II) GER:3b (DR:9)

5 units, Win (Stronza, Durham)

161B. Human Ecology of the Amazon—Introduces the various ecosystems of the Amazon and their human inhabitants. The biotic and abiotic factors shaping human adaptation to the region. Ethnographic literature is used to explore subsistence patterns and the resource use of Native Amazonians. Current changes in these economies and life-ways due to acculturation and market forces, and the implications for conservation. (HEF IV)

5 units (Lu) not given 2000-01

162. Indigenous Peoples and Environmental Problems—The social and cultural consequences of contemporary environmental problems. The impact of market economies, “development” efforts, and conservation projects on indigenous peoples, emphasizing the Amazon, E. Africa, and Central America. The role of indigenous grass roots organizations in combating environmental destruction and degradation of homeland areas. (HEF II, IV)

3-5 units (Durham) not given 2000-01

163. Community-Based Conservation—Community-based participatory models for conservation that represent alternatives to conventional top-down approaches. Case studies: pollution control in the U.S., wildlife conservation in Africa, and protection of tropical rainforests in Latin America. The strengths and weaknesses of alternative approaches to conservation, and the potential for community-based models to make a difference. (HEF II)

5 units (Staff) not given 2000-01

164. Ecological Anthropology—(Same as Human Biology 134.) The relationships between human social systems and their environments. How do environments influence the nature and form of human social systems found within them? How do human social systems influence the properties and dynamics of their environments? How can we best conceptualize and understand human social systems, environment, and the links between them? Case studies of human societies in the Arctic, Amazon, E. Africa, the Alps, and Papua New Guinea. (HEF III)

5 units (Durham) not given 2000-01


5 units, Spr (Rosenkrantz)

166A. Indigenous Forest Management—(Enroll in Human Biology 172.) (HEF IV)

5 units, Aut (Irvine)

166B. Fishing for Solutions: Issues in Marine Conservation—(Graduate students register for 266B.) The stories behind communities and their fisheries relate to a resource we cannot see. The history of exploitation of cod, salmon, tuna, and grouper are instructive of the wider challenges facing marine resource management. The complex of cultural, biological, and economic facets that shape a fishery.

3-5 units, Win (Noye)

167. Anthropology of Tourism and Ecotourism—(Enroll in Human Biology 188.)

5 units, Aut (Stronza)

168A. Ecology and Equity—Comparative, cross-cultural perspective on the global environmental debate. The origins, articulations, and resolutions of environmental conflicts, drawing on cases and movements from a variety of societies. Strategies and limits of deep ecology, ecofeminism, alternative technology, Gandhiism, and other approaches. (HEF II)

5 units, not given 2000-01

168B. Environmental Justice—The social movement uniting environmentalism and social justice into one framework. People of color, and people who are socially, economically, and politically disenfranchised often bear the burden of environmental problems. Examples from the U.S., S. America, and Africa are used to examine hazardous waste landfills, petroleum exploitation, and exposure to pesticides and toxic
chemicals in the workplace. The history of environmental justice movement, evidence for its claims, and its challenges and contributions.  
5 units, Aut (Lu)

**MEDICAL ANTHROPOLOGY AND GENETICS**

In addition to the courses listed directly below, ANSI courses 133B and 151, listed in other concentration tracks, also count towards the Track 4 concentration.

**MEDICAL ANTHROPOLOGY**

170. **Medical Anthropology**—(Graduate students register for 270.) For students with interests in health care. Introduction to curing systems in Western and in non-Western cultures; problems of adapting modern medicine to diverse cultures; explication of the social and cultural correlates of physical and mental health and disease (social epidemiology). (HEF IV) GER:3b (DR:9)  
5 units, Aut (Barnett)

171. **Aging: From Biology to Social Policy**—What can we expect when we join the ranks of the elderly? What are the biological processes that contribute to aging and are they the same across all populations and cultures? What are the cultural, social, and economic consequences of a large portion of the elderly? What implications do they have for social policy? Readings, lectures, and films. Students are assisted in research and working with the elderly. (HEF I) GER:3b (DR:9)  
5 units, Spr (Barnett)

172. **Evolutionary Medicine**—(Graduate students register for 272.) Seminar on understanding human health and disease from an evolutionary perspective. Topics: Darwinian medicine, genes and disease, aging, infectious diseases, mental illness, and cancer. Prerequisites: 2A, 2B, upper division standing; or consent of the instructor. (HEF III)  
5 units, Aut (Cronin)

173. **Disease, Health, and Culture Change**—Humans buffer themselves against the consequences of ill health through their capacities for storing and transmitting knowledge, and for dividing the labor of subsistence in flexible ways. Class, ethnic, and sex/gender differences are examined to assess the significance of disease and health as factors in cultural evolution. Prerequisites: 2A, 2B; or consent of the instructor. (HEF III)  
5 units, Spr (Barnett)

174. **Bioethics and Anthropology**—(Graduate students register for 274.) The relevance of moral and ethical issues in health and illness, the development of scientific knowledge, and applications of biomedical technology from an anthropological perspective. The ways moral problems in science and technology are culturally situated, defined, and resolved in specific historical, political, social, and economic contexts. Examine research ethics for anthropologists studying health and illness. Focus is on the cultural production of moral dilemmas in biomedicine and healing practices in diverse cultures.  
5 units, Spr (Koenig)

**ANTHROPOLOGICAL GENETICS**

180. **Human Evolutionary Genetics**—(Graduate students register for 280.) The evolution of modern humans as inferred from available genetic data. Quantitative methods are used to analyze mitochondrial DNA and allele frequencies. Inference of human migrations and expansion. Genetic support for models of the evolution of modern humans. Comparison of genetic data with archaeological and linguistic data. Emphasis is on critical reading of the literature. Prerequisite: 2A, 2B; or equivalents. Recommended: introductory statistics. (HEF II, III)  
4-5 units (Mountain) not given 2000-01

181. **Genes and Culture through Time and Space**—Exploration, through the use of computer modeling, of the parallels and interactions between human history, genes, and culture. When do we observe similarities between genetic and cultural patterns? What are the uses of models? Does greater complexity always improve a model? What are the advantages and disadvantages of simulation? Is it easier to predict genetic or cultural patterns? When do they influence one another? Students generate hypotheses, run simulations necessary to test these hypotheses, and analyze the output of the simulations. Prerequisites: 2A, 2B; or consent of instructor. (HEF III, V)  
5 units (Mountain) not given 2000-01

189. **Research Methods in Anthropological Genetics**—(Graduate students register for 289.) Practical training and experience in the molecular biology and data analysis techniques currently applied in anthropological genetics. Collection of samples, DNA extractions, polymerase chain reaction (PCR), gel electrophoresis, DNA sequencing. Basic techniques in the analysis of population genetic data. Prerequisites: 2A, 2B; or consent of instructor. (HEF V)  
5 units, Spr (Mountain)

**SPECIAL COURSES**

190. **History of Theory in the Anthropological Sciences**—(Graduate students register for 290A.) Required of all majors. Seminar on foundational texts in anthropology, from Darwin and Marx to Geertz and Sahlins. Emphasis is on the materialist and evolutionary theories of culture. Presentations by members of the faculty. (WIM)  
5 units, Aut (Gates)

192. **Data Analysis in the Anthropological Sciences**—The univariate, multivariate, and graphical methods used for analyzing quantitative data in anthropological research. Archaeological and paleobiological examples illustrate various methods. Recommended: knowledge of algebra. (HEF V)  
5 units (Klein) not given 2000-01

193. **Prefield Research Seminar**—Prepares for field or laboratory research. Students develop testable hypotheses and realistic data collection procedures, reviewing common data collection techniques including participant-observation, interviewing, surveys, and sampling procedures as appropriate. Emphasizes theory-guided empirical work. Prerequisites: 2A, 2B, or equivalents; and declared concentration track. (HEF V)  
5 units, Spr (Staff)

194. **Postfield Research Seminar**—Undergraduates analyze and write about material gathered during summer fieldwork. Emphasizes writing and revising as key steps in analysis and composition. Students critique classmates' work and revise their own writing in light of others' comments. (HEF V)  
5 units, Aut (Staff)

195. **Research Project**—Independent research conducted under faculty supervision, normally taken junior or senior year in pursuit of an honors project. May be taken for more than one quarter for credit. Prerequisite: completed application to the honors program.  
1-10 units, any quarter (Staff)

196. **Honors/Master's Writing Workshop**—For students in the process of writing honors' or master's papers. Techniques for interpreting data, organizing bibliographic material, writing, editing, and revising. Preparation of papers for conferences and publications in anthropology.  
2-5 units, any quarter (Staff)

197. **Internship in Anthropological Sciences**—Provides undergraduates with the opportunity to pursue their area of specialization in an institutional setting (e.g., a laboratory, a clinic, a research institute, or a government agency, etc.).  
4-5 units, any quarter (Staff)

198. **Museum Methods**—Individually directed work on anthropology collections. Introduction to the computerized storage and retrieval systems, cataloging, exhibit techniques. Can be taken for one or two quarters...
by arrangement with instructors. (HEF V)
1-4 units, any quarter (Rick)

199. Directed Individual Study—(Graduate students register for 299.)
Opportunity for advanced students to explore special areas of interest.
1-10 units, any quarter (Staff)

GRADUATE

These courses are intended for graduate students. However, advanced undergraduates may be admitted with consent of the instructor.

201A. History of Anthropological Theory, 18th and 19th Centuries—Comparative analysis of the major 18th- and 19th-century social theorists (Boas, Darwin, Freud, Marx, Morgan, Tylor, Weber) and a historical examination of their contributions to the rise of anthropology.
5 units (Wolf) not given 2000-01

5 units (Wolf) not given 2000-01

202. Political Economy and Gender Theory—Evolutionary theory as it relates to the emergence of varied political economies. Readings: Marx, Sahlins, Geertz, and Bloch. Recommended: working knowledge of Darwinian theory.
5 units (Gates) not given 2000-01

203. Theory and Method in Cultural Evolution—Graduate section; see 103.
5 units (Durham) not given 2000-01

204. Culture and Politics in South Asia—Seminar on the ethnographies of S. Asia, a region unparalleled in its ecological and cultural diversity, in its range and intensity of social conflict, and in its cultural expressions. Themes: nationalism, religious violence, class conflict, and the fate of indigenous peoples. A close look at S.-Asia ethnographies and exemplary models, to guide future student research.
5 units (Staff) not given 2000-01

205. Applied Anthropology—Anthropologists apply their knowledge and skills to a variety of problems: developing and evaluating medical care delivery systems and educational programs at home and abroad; assisting in the transfer of technological innovations and predicting and measuring their impact; serving as planners, administrators, and advisers for developing programs. The substance of such programs, the utility of anthropological theory and research approaches in solving contemporary problems, and the ethics of professional practice.
5 units (Barnett) not given 2000-01

207. Culture and Cognition—(Same as Psychology 179.) Graduate section; see 107.
5 units, Aut (Hirschfeld)

208. Models and Imaging in Anthropological Computing—Develops skills in working with digital imagery relevant to anthropology, using ANSI microcomputers. Hands-on seminar in which some specific background information and methodology is made available, and a sharing of skills goes on between participants and instructor.
3 units, Spr (Rick)

209. Research Methods in Cultural Anthropology—Introduction to basic cultural field methods: interviewing; observation; taking and using field notes; linguistic elicitation; mapping; film, video, digital, and tape recording; archival documents and historical materials; questionnaires, surveys, and statistics. The ethics of field research (prefield, field, and postfield); the relationship of methods to research problems and data analysis; and procedures for maintaining physical and mental health in the field.
5 units (Barnett) not given 2000-01

212. Linguistic Anthropology—Seminar on language in its cultural contexts. Topics similar to those in ANSI 4, but reading emphasis is on journal articles rather than monographs.
5 units (Fox) not given 2000-01

213. Topics in Linguistic Anthropology (Vocabulary and Culture)—Seminar on society, culture, and cognition as reflected in vocabulary; semantic analysis and universals of terminological systems; vocabulary size, abstraction, and the issue of primitiveness; variation, tropes, and strategy in vocabulary use. Emphasis is on the vocabularies of identity (kinship, personal names, and the body) and the environment (plants, animals, and place).
5 units, Aut (Fox)

219. Linguistic Field Methods—Graduate section; see 119.
5 units, by arrangement (Fox)

220. China for Social Analysts—The analytic constructs for the holistic study of 19th- and 20th-century China. See instructor for reading list.
5 units (Gates) not given 2000-01

230. Genetics and Modern Human Origins—Graduate seminar focusing on when and where modern humans originated. Did the most recent common ancestors of modern humans exist 1 million or 50,000 years ago? Where did they live, and what other hominid groups existed? Does the available genetic data enable us to distinguish between the competing theories of the origin of modern humans? What kinds of data are necessary for testing these hypotheses? How much can genetic data tell us about our origins? What is the impact of conclusions regarding our origins? Emphasis is on critical reading and discussion of recent literature.
5 units (Mountain) not given 2000-01

232. Human Evolutionary Anatomy—Focus is on the basis for reconstructing the form, adaptation, and life style of prehistoric humans: the interpretation of their skeletal remains. Integrating features: musculature, body size, stance, brain size, organization, activity patterns, sexual dimorphism, and speech potentiality.
5 units (Staff) not given 2000-01

233A. Beginning Osteology—Graduate section; see 133A.
5 units, Aut (Maggioncalda)

233B. Advanced Osteology—Graduate section; see 133B.
5 units, Win (Staff)

235. Human Evolutionary Systematics—Recent developments and debates in the application of evolutionary systematics specifically to the human fossil record; the utility of cladistic vs. phenetic methods, especially at the species and subspecies level; trait definition and conceptualization; and the utility of heterochronic and functional information in phylogenetic reconstruction.
4-5 units (Staff) not given 2000-01

236. Evolution and Aggression—Seminar on aggression in human and non-human primates. Topics: primate and early hominid origins of aggression, the place of aggression in the evolution of complex societies, and critiques of theories of aggression.
5 units (Maggioncalda) not given 2000-01

237. Climate and Human Evolution—Patterns of human morphological diversity and adaptive response to climate has played a pivotal role in human evolution. The role of technology and cultural buffering in
238. Evolutionary Psychology—(Same as Psychology 168.) Graduate section; see 138.
5 units, Win (Hirschfeld)

239. Evolutionary Anthropology: Theory and Methods—The history of evolutionary theory from the 19th century to present, emphasizing anthropological applications. The theory and methods behind classical evolutionary anthropology, unilinear and multilinear evolution, functionalism and neo-evolutionism, sociobiology, evolutionary psychology, and dual inheritance theory. Prerequisite: graduate standing or consent of the instructor.
5 units (Durham) not given 2000-01

240. Stone Tools in Prehistory—Graduate section; see 140.
5 units (Rick) not given 2000-01

241. Hunter-Gatherers in Archaeological Perspective—Graduate section; see 141. (HEF II)
5 units, Win (Rick)

242. Beginnings of Social Complexity—Models and examples of the social evolution of stratification and political centralization in prehistoric human societies. Inferences from the archeological record concerning the forces and mechanisms behind the rise and fall of complex societies, particularly in S. America.
5 units (Rick) not given 2000-01

247. Animal Bones for the Archaeologist (Faunal Analysis)—Seminar focuses on the vertebrate skeleton and methods for reconstructing past environments and ecology from assemblages of fossil bones. Emphasis is on how bones from ancient archaeological sites are used to reconstruct their human environments and ecology. Enrollment limited.
5 units (Klein) not given 2000-01

248. Dating Methods in Archeology and Paleonanthropology—Seminar on the primary geochronological methods used to date archeological and human fossil sites and to calibrate major transitions in human evolution. The fundamental principles of radiometric, paleomagnetic, and thermoluminescence techniques; extensive use of real archeological samples. Field trips to U.S. Geological Survey and Lawrence Livermore Laboratory. Prerequisite: knowledge of algebra. Recommended: basic chemistry.
5 units (Klein, Bischoff) not given 2000-01

5 units, Win (Durham)

251. Anthropological Solutions to Environmental Problems—The actual and potential role of anthropology in helping solve major environmental problems. Case studies: anthropologists and human rights in Central America; anthropologists and indigenous peoples in Brazilian rainforests; anthropologists and development interests in Indonesia, Australia, and sub-Saharan Africa. Emphasis is on the role of culture and social variables in the design of successful solutions to environmental problems.
5 units (Staff) not given 2000-01

252. Political Ecology—Seminar on the causes and consequences of environmental degradation in diverse social and ecological settings. Emphasis is on the role of political and economic forces in ecological change, including forces that promote differential access to resources within and between local populations. Case studies: tropical deforestation, rangeland degradation, soil erosion, drought, and famine.
5 units (Durham) not given 2000-01

266. Human Evolutionary Ecology—How theories and models from evolutionary ecology can elucidate patterns of human adaptation and behavior. Review of various models from optimal foraging theory; analysis of prey and patch choice, mobility, group size, and subsistence risk. Case studies on human populations living in arctic, tropical, and arid environments.
5 units, Spr (Lu)

266B. Fishing for Solutions: Issues in Marine Conservation—Graduate section; see 166B.
3-5 units Win (Novy)

267. Social Policy for Sustainable Resource Use—Graduate section; see 167.
5 units (Irvine) not given 2000-01

269. Research Methods in Ecological Anthropology—The methods utilized in ecological and environmental anthropology. Topics survey techniques for agricultural and demographic data, mapping and field measurement, energy flow, time allocation, and transect and quadrant sampling.
5 units (Staff) not given 2000-01

270. Advanced Medical Anthropology—Students work on a predeter-
mined research problem of their choice in medical anthropology and as it progresses, and present their work for supportive discussion and assistance. Prerequisite: 140 or consent of instructor.
5 units, Win (Barnett)

272. Evolutionary Medicine—Graduate section; see 172.
5 units, Spr (Cronin)

274. Bioethics and Anthropology—Graduate section; see 174.
5 units, Spr (Koenig)

280. Human Evolutionary Genetics—Graduate section; see 180.
4-5 units (Mountain) not given 2000-01

281. Genes and Human Behavior—Graduate seminar focusing on the extent to which genes have been linked to human behavior. The methods used for inferring a genetic basis of human behavior: primate studies, twin studies, medical research. Emphasis is on the critical evaluation of research.
5 units (Mountain) not given 2000-01

282. Colonization and Migration in Human Evolution—For graduate students and advanced undergraduates. Seminar bridging the biological and social science studies of migration, genetic microevolutionary theory, and human evolution. Colonization and migration in human history and prehistory. How have social structure, mating patterns, and other factors influenced the extent and pattern of human migration? How have migration and colonization influenced patterns of human genetic variation? When have humans colonized new areas or invaded regions on a large scale? Can we infer such processes from patterns of modern or prehistoric human genetic variation? Focus is on a set of case studies; in the initial spread from Africa, the peopling of the Americas, and the spread of agriculture through Europe.
5 units, Aut (Mountain)
(Enroll in Law 649.)
2 term units (Greely, Cox) not given 2000-01

289. Research Methods in Anthropological Genetics—Graduate section; see 189.
5 units, Spr (Mountain)

SPECIAL COURSES

290. Graduate Core Seminar—Required of all graduates students in residence. Year-long seminar on topics and issues in anthropological sciences. First quarter emphasis is on the current and future research efforts of departmental faculty. Topics for subsequent quarters include: aggression; race, gender, and inequality; anthropology and evolutionary theory; disease; and demography.
1-5 units, Aut, Win, Spr (Staff)

291. Research Methods in Anthropology—Graduate seminar on the use of the scientific method in anthropological research. Published papers from various subfields illustrate effective research design, the formulation and testing of hypotheses, and comparative methods. Field exercises in interviewing, observation, and the taking and use of field notes. The ethics of field research and procedures for maintaining physical and mental health in the field.
5 units, Win (Barnett)

292. Data Analysis in the Anthropological Sciences—Graduate section; see 192.
5 units (Klein) not given 2000-01

293. First-Year Paper/A.M. Paper Writing Seminar—Provides students with assistance and guidance with first-year paper and masters' thesis.
2-3 units, Win, Spr (Mountain)

294. Proposal Writing Seminar—Required of all ANSI Ph.D. students. Hands-on practical training in grant writing methods. Students draft a research prospectus based on their own interests and proposed projects, and work closely with their advisers and other faculty.
5 units, any quarter (Staff)

295. Research in Anthropological Sciences—Supervised work with an individual faculty member on the student research project. May be taken for more than one quarter.
5 units, any quarter (Staff)

296. Graduate Internship—Provides graduates with the opportunity to pursue their area of specialization in an institutional setting (e.g., laboratory, clinic, research institute, government agency, etc.).
4-5 units, any quarter (Staff)

297. Teaching Assistantship—Supervised experience as assistant in one undergraduate course.
5 units, any quarter (Staff)

298. Dissertation Writing Seminar—Required of all ANSI Ph.D. students. Students work closely with their advisers and committee members to write a draft of their dissertation.
5 units, any quarter (Staff)

299. Directed Individual Study—(Graduate section; see 199.) Opportunity for advanced students to explore special areas of interest.
5 units, any quarter (Staff)

APPLIED PHYSICS

Emeriti: (Professors) Marvin Chodorow, C. Chapin Cutler, Theodore H. Geballe, W. Conyers Herring, Peter A. Sturrock; (Professors Research) Bertram A. Auld, H. John Shaw, Herman Winick; (Courtesy) Gordon S. Kino, William E. Spicer

Chair: Robert L. Byer


Assistant Professors: Ian R. Fisher, Martin Greven, Kathryn A. Moler

Professors (Research): Calvin F. Quate, Helmut Wiedemann

Courtesy Professors: Bruce M. Clemens, James S. Harris, Lamberto Hesselnk, David A. B. Miller, Douglas D. Osheroff, Shoucheng Zhang

Consulting Professors: Richard G. Brewer, John D. Fox, Bernardo A. Huberman, Stuart S. P. Parkin, Daniel Rugar

Visiting Associate Professor: Subramanian Subbiah

The Department of Applied Physics offers qualified students with backgrounds in physics or engineering the opportunity to do graduate course work and research in the physics relevant to technical applications and natural phenomena. These areas include accelerator physics and synchrotron radiation, atomic physics and lasers, biophysics, condensed matter physics, materials physics, solid state and quantum electronics, and space science and astrophysics. Student research is supervised by the faculty members listed above and also by various members of other departments such as Electrical Engineering, Materials Science and Engineering, Physics and occasionally Biological Sciences, Chemistry, and faculty of the Medical School who are engaged in related research fields. Research activities are carried out in research laboratories and centers on campus and at the Stanford Linear Accelerator Center.

The number of graduate students admitted to Applied Physics is limited. Applications should be received by January 1, 2001. Graduate students normally enter the department only in Autumn Quarter.

UNDERGRADUATE PROGRAM

MINORS

Applied Physics currently does not offer an undergraduate major. The following minor program is intended for undergraduate non-physics science and engineering majors seeking to broaden and deepen their knowledge of modern physics, with an applied flavor. The minor consists of three required 4-unit courses, covering quantum mechanics and statistical physics, and a minimum of three breadth courses. The total number of units required for the minor is not less than 21 units and not more than 36 units.

Required Applied Physics courses are:

Course No. & Subject Units
150. Applied Quantum Mechanics I 4
151. Applied Quantum Mechanics II 4
152. Applied Statistical Mechanics 4

Breadth Applied Physics courses (choose a minimum of three) are:

172. Physics of Solids I (Enroll in Physics 172) 3
192. Introductory Biophysics 3
195. Waves and Diffraction in Materials (Enroll in Mat. Sci. & Engr. 195) 4
196. Scattering Physics 4
198. Introduction to Synchrotron Radiation 3
231A. Lasers I (Enroll in Elect. Engr. 231) 3
231B. Lasers II (Enroll in Elect. Engr. 232) 3

Prerequisites for the minor include the Physics 40 series (or equivalent), the Mathematics 40 series and Mathematics 130 (or equivalents), and preferably Mathematics 103 and 132. Applied Physics 150, 151, and 152 provide an extra one-hour section each week for students who need to develop the necessary mathematical and physical background.
All courses fulfilling the minor must be taken for a letter grade, except when letter grades are not offered.

The minor declaration deadline is no later than the last day of the quarter two quarters before the quarter of degree conferred. For example, a student graduating Spring Quarter must declare the minor no later than the last day of Autumn Quarter of the senior year.

**GRADUATE PROGRAMS**

Admission requirements for graduate work in Applied Physics include a bachelor’s degree in physics or an equivalent engineering degree. Students entering the program from an engineering curriculum should expect to spend at least an additional quarter of study acquiring the background to meet the requirements for advanced degrees in Applied Physics.

**MASTER OF SCIENCE**

The University’s basic requirements for the master’s degree are discussed in the “Graduate Degrees” section of this bulletin. The minimum requirements for the degree are 36 units, of which at least 30 units must be graduate-level courses in applied physics, engineering, mathematics, and physics. The required program consists of the following:

1. Courses in physics and mathematics to overcome deficiencies, if any, in undergraduate preparation.
2. Basic graduate courses:
   a) Advanced Mechanics—one quarter, 3 units: Physics 210
   b) Electrodynamics—two quarters, 6 units: Physics 220, 221; Electrical Engineering 241, 242
   c) Quantum Mechanics—two quarters, 6 units: Physics 230, 231
3. Additional advanced courses in science and/or engineering, not including Directed Study (Applied Physics 290) or 1-unit seminar courses, to complete the requirement of 36 units.
4. A final overall grade point average (GPA) of ‘B’ is required for courses used to fulfill degree requirements.

There are no department or University examinations, and a thesis is not required. If a student is admitted to the M.S. program only, but later wishes to change to the Ph.D. program, the student must apply to the department’s Admissions Committee.

**DOCTOR OF PHILOSOPHY**

The University’s basic requirements for the Ph.D. (residency, dissertation, examination, and so on) are discussed in the “Graduate Degrees” section of this bulletin. The program leading to a Ph.D. in Applied Physics consists of course work, research, qualifying for Ph.D. candidacy, a research progress report, a University oral examination, and a dissertation as follows:

1. **Course Work**
   a) Courses in physics and mathematics to overcome deficiencies, if any, in undergraduate preparation.
   b) Basic graduate courses* (letter grades required):
      1) Advanced Mechanics—one quarter: Physics 210
      2) Statistical Physics—one quarter: Physics 212
      3) Electrodynamics—two quarters: Physics 220, 221; Electrical Engineering 241, 242
      4) Quantum Mechanics—two quarters: Physics 230, 231
      5) Laboratory—one quarter: Applied Physics 207, 208, 304, 305; Electrical Engineering 357, 410; Physics 201, 202, 203, 301; Materials Science and Engineering 171, 172, 173
   c) 18 units of additional advanced courses in science and/or engineering, not including Directed Study (Applied Physics 290), Dissertation Research (Applied Physics 390), and 1-unit seminar courses. Only 3 units at the 300 or above level may be taken on a satisfactory/no credit basis.
   d) A final average overall grade point average (GPA) of ‘B’ is required for courses used to fulfill degree requirements.
   e) Students are normally expected to complete the specified course requirements by the end of their third year of graduate study.

2. **Research**: may be conducted under the supervision of a member of the Applied Physics faculty or appropriate faculty from other departments.

3. **Ph.D. Candidacy**: satisfactory progress in academic and research work, together with passing the Ph.D. Candidacy Qualifying Examination, qualifies the student to apply for Ph.D. candidacy which must be completed before the third year of graduate registration. The examination consists of a seminar on a suitable subject delivered by the student before the faculty academic adviser (or an approved substitute) and two other members of the faculty selected by the department.

4. **Research Progress Report**: normally before the end of the Winter Quarter of the fourth year inclusive of pertinent graduate study prior to Stanford, the student arranges to give an oral research progress report of approximately 30 minutes, of which a minimum of 10 minutes should be devoted to questions from the Ph.D. reading committee.

5. **University Ph.D. Oral Examination**: consists of a public seminar in defense of the dissertation, followed by private questioning of the candidate by the University examining committee.

6. **Dissertation**: must be approved and signed by the Ph.D. reading committee.

*Requirements for item 1b may be totally or partly satisfied with equivalent courses taken elsewhere, pending the approval of the Graduate Study Committee.

**ASSISTANTSHIPS**

Research assistantships are available for Ph.D. candidates. Information on applying for financial aid is included in the admission packet received from Graduate Admissions, the Registrar's Office.

**COURSES**

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

79Q. Stanford Introductory Dialogue: Pros and Cons of Energy Options in the 21st Century—Preference to sophomores. Meeting the energy and transportation needs in the 21st century requires technological capability and political wisdom. Both benefit from an understanding of underlying sciences involved. The possibilities for reducing the present day less-than-optimum use of energy and materials. Other topics: automotive transport; electrical power technology including nuclear fission, superconducting power transmission, hydrogen fuel; greenhouse gases, ozone, and global warming.

2 units, Aut (Geballe)

150. Applied Quantum Mechanics I—(Graduate students enroll in Electrical Engineering 222.) For undergraduates. Introduction to quantum mechanics, emphasizing applications in modern devices and systems. Topics: Schrödinger’s equation, eigenfunctions and eigenvalues, operator approach to quantum mechanics, solutions of simple problems (including quantum wells, harmonic oscillators, simple periodic structures), tunneling, calculation techniques (including matrix diagonalization, perturbation theory, variational method), time-dependent perturbation theory (including application to optical absorption), fundamental postulates of quantum mechanics. Prerequisites: Physics 45 and 47, or Physics 65, or equivalents.

4 units, Aut (Miller)

151. Applied Quantum Mechanics II—(Graduate students enroll in Electrical Engineering 223.) For undergraduates. Continuation of 150, including more advanced topics: spin and identical particles; effective mass theory for semiconductors; annihilation and creation operators; density matrices; introductory quantum optics; and other topics in electronics, optoelectronics, and optics. Prerequisite: 150.

4 units, Spr (Miller)

152. Applied Statistical Mechanics—For undergraduates. The principles of statistical mechanics and quantum statistical physics. Fundamental concepts of equilibrium and non-equilibrium systems and noise
processes. Density matrix, master equations, Langevin equations, fluctuation-dissipation theorem. Illustrative in-class problem solving sessions elucidate the central ideas and methods.

4 units, not given 2000-01

172. Physics of Solids I—(Enroll in Physics 172.)
3 units, Spr (Greven)


3 units, alternate years, given 2001-02

195. Waves and Diffraction in Solids—(Enroll in Materials Science and Engineering 195.)
4 units, Win (Clemens)

196. Scattering Physics—For undergraduates; see 218. Prerequisites: 150, 151, and Physics 172 or equivalent.
4 units, not given 2000-01

198. Introduction to Synchrotron Radiation—For students using such radiation for basic and applied research and students in accelerator physics concentrating on source developments and the study of particle beam characteristics and stability. Electromagnetic radiation from relativistic electron beams, derived from first principles. Coherent and incoherent synchrotron radiation, free electron lasers; undulator and wiggler radiation with linear and elliptical polarization. Recommended: electromagnetism, optics, and special relativity.

3 units, Spr (Wiedemann) alternate years, not given 2001-02


207. 3 units, Win (Fox)
208. 3 units, Spr (Fox), alternate years, not given 2001-02

210. Advanced Particle Mechanics—(Enroll in Physics 210.)
3 units, Aut (Petter)

211. Biophysics of Sensory Transduction—(Enroll in Biological Sciences 211.)
4 units, Spr (Block)

212. Statistical Mechanics—(Enroll in Physics 212.)
3 units, Spr (Laughlin)

215. Numerical Methods for Physicists and Engineers—Review of basic numerical techniques with additional advanced material: derivatives and integrals; linear algebra; linear least squares fitting, FFT and wavelets, singular value decomposition, linear prediction; optimization, nonlinear least squares, maximum entropy methods; deterministic and stochastic differential equations, Monte Carlo methods.

3 units, alternate years, given 2001-02


3 units, Spr (Shen)

217. Waves and Diffraction in Solids—(Enroll in Materials Science and Engineering 205.)
3 units, Win (Clemens)

218. Scattering Physics—Introduction to scattering techniques, including neutron, x-ray, and light scattering. Probing of phase transitions and excitations in condensed matter. Emphasis on magnetic scattering from experimental model systems and from novel materials. Topics: low-dimensional magnets, e.g., Heisenberg chains and planes; and magnetic fluctuations in high-temperature superconductors. “Global” scattering probes are contrasted with “local” probes, e.g., nuclear magnetic resonance (NMR) and muon spin resonance (muSR). Prerequisites: 150, 151, and Physics 172 or equivalent.
3 units, not given 2000-01

3 units, Aut (Linde)

220, 221. Classical Electrodynamics—(Enroll in Physics 220, 221.)
220. 3 units, Win (Silbergeist)
221. 3 units, Spr (Zhang)

222. Applied Quantum Mechanics I—Enroll in Electrical Engineering 222.
3 units, Aut (Miller)

3 units, Spr (Miller)

225. Quantum Information—Fundamental concepts of quantum theory: linear superposition, entanglement, non-locality and projective measurement. Two photon interference and Bell’s inequality. Fundamental limit in quantum measurement: quantum nondemolition measurement, non-linear measurement and quantum zero effect. Quantum key distribution and teleportation: information, energy dissipation and reversible computer. Quantum algorithms, physical implementation and scaling law. Quantum hardware. Decoherence of quantum systems and quantum error correction codes.

3 units, Spr (Yamamoto)

230A, B. Quantum Mechanics—(Enroll in Physics 230, 231.)
230A. 3 units, Aut (Shenker)
230B. 3 units, Win (Chu)
optical bistability. Optical pumping and spectroscopy of atomic and other four wave mixing interactions such as wavefront conjugation and related Raman and Brillouin scattering, Coherent Anti-Stokes scattering, harmonic generation, parametric oscillators, modelocking, stimulated emission, and quantum coherent phenomena.

268L. Introduction to Modern Optics Laboratory—Optional laboratory component to 268A.
3 units, Aut (Byer)

272. Solid State Physics: Survey—Crystal structures and symmetry, phonon spectra and energy bands, defects, surfaces, equilibrium and transport properties, Fermi-Thomas and quantum screening, surfaces, optical properties, magnetism, and superconductivity. Prerequisite: some knowledge of quantum mechanics, and preferably undergraduate solids.
3 units, Aut (Byer)

273. Solid State Physics: Continuation—Second quantization, microscopic theory of superconductivity, transition metals and compounds, magnetic resonance, inelastic and many-body effects. Prerequisite: 272.
3 units, Win (Byer)

290. Directed Studies in Applied Physics—Special studies under the direction of a faculty member for which academic credit may properly be allowed. May include lab work or directed reading.
any quarter (Staff)

291. Practical Training—Opportunity for practical training in industrial labs. Arranged by student with the research adviser’s approval. A brief summary of activities is required, approved by the research adviser.
3 units, Sum (Staff)

301. Astrophysics Laboratory—Enroll in Physics 301.
3 units, Sum (Walker)

304. Lasers Laboratory—Laser theory and practice. Lectures on the theoretical and descriptive background for lab experiments, detectors and noise, lasers (helium neon, beams and resonators, argon ion, cw dye, titanium sapphire, semiconductor diode, and the Nd:YAG). Measurements of laser threshold, gain, saturation, and output power levels. Laser transverse and axial modes, linewidth, and tuning, Q-switching and modelocking. Limited enrollment. Prerequisites: Electrical Engineering 231 and 232, or consent of instructor.
3 units, Win (Byer)

305. Nonlinear Optics Laboratory—Emphasis is on laser interaction with matter. The laser devices provide the radiation required to explore the linear and nonlinear properties of matter. Experiments on modulation, harmonic generation, parametric oscillators, modelocking, stimulated Raman and Brillouin scattering, Coherent Anti-Stokes scattering, other four wave mixing interactions such as wavefront conjugation and optical bistability. Optical pumping and spectroscopy of atomic and molecular species. Limited enrollment. Prerequisites: 304, Electrical Engineering 231 and 232, or consent of instructor.
3 units, Spr (Byer)

324. Introduction to Accelerator Physics—Introduction to basic accelerator physics in linear and circular accelerators. Topics: acceleration, phase stability, transfer matrices, beam envelopes, emittance, and the effects of synchrotron radiation. Topics of current research, including nonlinearities and instabilities.
3 units, alternate years, given 2001-02

3 units, Spr (S. Harris)

3 units, Aut (Hesselink) alternate years, not given 2001-02

3 units, alternate years, given 2001-02

3 units, alternate years, given 2001-02

3 units, alternate years, given 2001-02

3 units, alternate years, given 2001-02

3 units, Win (Yamamoto)

390. Dissertation Research
any quarter (Staff)

392. Topics in Molecular Biophysics—Concepts from statistical mechanics are applied to problems in contemporary molecular biology: allosteric transitions; protein folding; molecular recognition; actin polymers and gels; molecular motors; lipids and membrane proteins; ion channels. Some of the basic models used to quantitate fundamental biomolecular functions. Prerequisites: elementary statistical mechanics and chemical kinetics.
3 units, Win (Doniach) alternate years, not given 2001-02
453. Special Topics in Accelerator Physics—Research level discussions of current topics in accelerator physics. Content varies each quarter and year, depending on the interests of staff and students. Course may be repeated. Offered occasionally.

453A. Storage Ring Beam Dynamics—The phenomenology of particles and beams in storage rings. Topics: beam generated signals, instabilities, the beam-beam interaction, and non-linearities. Theoretical treatment combined with discussions of experimental techniques and observations. 3 units, Aut (Siemann)

459. Frontiers in Interdisciplinary Biosciences—Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible. Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford’s Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics. 1 unit, Aut, Win, Spr (Block)

463. Special Topics in Astrophysics—Enroll in Physics 463.

470. Condensed Matter Seminar—Discussion of current research and literature in condensed matter physics offered by faculty, students, and outside specialists. (AU)

473. Special Topics in Condensed Matter Physics—Research-level discussions of current topics in condensed matter physics. Content varies each quarter and year, depending on the interests of staff and students. Course may be repeated. Offered occasionally

473A. Condensed Matter Physics—Students undertake background study prior to each weekly seminar offered through 470 as an introduction to topics of contemporary interest in condensed matter physics; critique each seminar for success in oral communication, and present one-hour seminar on a contemporary topic for critique by the class. Corequisite: 470. 2 units, Aut (Greven)

473B. Physics of Disordered Systems—Disorder effects in electronic materials, e.g., disordered superconductors, magnets, and low dimensional systems. 3 units, Win (Kapitulnik)

473C. Physics of Strongly Correlated Electron Systems—Survey of recent advances in the physics of strongly correlated electron systems: Kondo effect, heavy fermion physics, slave boson methods, models of high Tc superconductivity, fractional quantum hall effect, anyon representations. 3 units, Spr (Doniach)

483. Optics and Electronics Seminar—Weekly presentations and discussions of current research topics in lasers, quantum electronics, optics, and photonics by faculty, students, and invited speakers. (AU)

STANFORD ARCHAEOLOGY CENTER

Co-Directors: Ian Hodder (Cultural and Social Anthropology), Ian Morris (Classics, and History)

Affiliated Faculty: Ian Hodder (Cultural and Social Anthropology), Laura Jones (Campus Archaeology), Richard Klein (Anthropological Sciences), Gail Mahood (Geological and Environmental Sciences), Jody Maxmin (Art and Art History, and Classics), Ian Morris (Classics, and History), Joanna Mountain (Anthropological Sciences), Amos Nur (Geophysics), John Rick (Anthropological Sciences), Tom Seligman (Cantor Art Center), Mike Shanks (Classics)

The Stanford Archaeology Center brings together various faculty and staff members with direct interest in archaeology, and highlights the fact that archaeology is a bridging discipline. From its inception in the 18th and 19th centuries, archaeology has been linked to history and the humanities on the one hand and to the natural sciences on the other. In recent decades archaeological use of the natural sciences has burgeoned, but so too has archaeology as a component of historical enquiry and as a part of ethnographic, social, and cultural research.

The program builds on the well specified research interests of the archaeology faculty in Cultural and Social Anthropology, Anthropological Sciences, and Classics without confining the practice to any one focus in particular. Faculty and staff from Geological and Environmental Sciences, Geophysics, as well as the Cantor Art Museum and the Office of the Campus Archaeologist are also central to the program.

The strength of the program is its holistic approach to an archaeology that is theoretically aware and which makes full use of multiple methods from a variety of sources. Faculty research areas include Greece, Italy, Central Europe, Turkey, Peru, Southern Africa, and North America and cover periods from early humans to historical periods and contemporary study of material culture.

UNDERGRADUATE MINOR

In addition to meeting the University requirements for the undergraduate minor, all undergraduate minors in archaeology are expected to complete a minimum of six courses with a minimum of 27 units. Students who wish to minor in Archaeology should contact the Archaeology program director, who will then assign a faculty adviser.

Required Courses (two courses, 10 units)—Students are required to take both:

Course No. and Subject Units

Gateway:
Anthro. Sci. 3. Introduction to Prehistoric Archaeology* 5

Capstone:
Cult. & Soc. Anthro. 139. Archaeology in the Modern World* 5

* Anthropological Sciences is highly recommended as a first course and many of the upper-level courses in archaeology require this course as a prerequisite. Cultural and Social Anthropology 139 is considered a capstone course, and it is recommended that students take this as the last course in their minor program.

Area of Concentration (two courses, 10 units)—Students must also choose, with the approval of the Archaeology program director, an area of concentration in archaeological research to be defined by a minimum of two courses. These courses should provide both breadth and depth in a specific research area. Concentrations should be focused on the archaeology of a particular geographic area, special topics studies, or focused analyses. Sample concentrations include Mediterranean Archaeology, New World Archaeology, Hunter-Gatherer Archaeology, and the Archaeology of Complex Societies. Concentration courses are as follows:

Hunter-Gatherer Archaeology:
Anthro. Sci. 130. Modern Human Origins 5
Anthro. Sci. 140. Stone Tools in Prehistory 5
Anthro. Sci. 141. Hunter-Gatherer Archaeology 5
Anthro. Sci. 142. Incas and their Ancestors 5
Cult. & Soc. Anthro. 173. Hunter-Gatherers in Latin America 5
Cult. & Soc. Anthro. 174. Trade and Exchange in Archaeology 5

234
ARCHAEOLOGY OF COMPLEX SOCIETIES:

Anthro. Sci. 111. Language and Prehistory 5
Anthro. Sci. 122. The Maya 5
Anthro. Sci. 140. Stone Tools in Prehistory 5
Anthro. Sci. 141. Hunter-Gatherer Archaeology 5
Anthro. Sci. 142. Incas and their Ancestors 5
Anthro. Sci. 143. State Formation in South America 5
Cult. & Soc. Anthro. 137. Introduction to Archaeological Methods 5
Geog. and Envir. Sci. 1. Fundamentals of Geology 5
Geog. and Envir. Sci. 112. Mapping the Geological Environment 4
Geog. and Envir. Sci. 140. Geomorphology 3
Geog. and Envir. Sci. 195. Remote Sensing and GIS 3
Geog. and Envir. Sci. 196. Introduction to GIS 2
Geoph. 50Q. Earthquakes and Archaeology 5
Archaeological Skills (one course, minimum 2 units)—Students must take at least one course in archaeological skills such as archaeological fieldwork, botanical analysis, cartography, ceramic analysis, dating methods, faunal analysis, genetics, geology, geographic information systems, geology, geomorphology, geophysics, osteology, remote sensing, soil chemistry, and statistics. The following are skill courses:
Anthro. Sci./Cult. and Soc. Anthro. 91. Archaeological Field Methods 5
Anthro. Sci. 192. Data Analysis in Anthropological Sciences 5
Anthro. Sci. 282. Colonization and Migration in Human Evolution 5
Classics 129. Archaeological Materials and the Survival 5
Classics 137. Introduction to Archaeological Methods 5
Geog. and Envir. Sci. 1. Fundamentals of Geology 5
Geog. and Envir. Sci. 112. Mapping the Geological Environment 4
Geog. and Envir. Sci. 140. Geomorphology 3
Geog. and Envir. Sci. 195. Remote Sensing and GIS 3
Geog. and Envir. Sci. 196. Introduction to GIS 2
Geoph. 50Q. Earthquakes and Archaeology 5
Archaeological Issues (one course, 5 units)—Students must take at least one course in archaeological issues which integrate theory, skills, and data such as the archaeology of complexity, archaeological theory, or material culture. These courses may be drawn from graduate-level courses with the approval of the instructor. The following are issue courses:
Anthro. Sci. 141. Hunter-Gatherer Archaeology 5
Anthro. Sci. 143. State Formation in South America 5
Classics 181. History of Archaeological Thought 5
Classics 300. The Problem of the East in Archaic Greece (graduate) 5
Classics 306. Archaeologies of the Recent Past (graduate) 5
Cult. and Soc. Anthro. 174. Trade and Exchange in Archaeology 5
Cult. and Soc. Anthro. 259. Approaches to the Body (graduate) 5

ART AND ART HISTORY

Emeriti: (Professors) Keith Boyle, Lorenz Eitner, John LaPlante, Suzanne Lewis, Frank Lobdell, Dwight C. Miller, Nathan Oliveira, Michael Sullivan
Chair: Richard Vinograd
Associate Chair for Studio Art, Director of Studio Art Program, and Principal Adviser to Undergraduate Studio Majors: Kristina Branch
Principal Adviser to Undergraduate Art History Majors: Jody Maxmin
Director of Graduate Studies in Studio Art: David Hannah
Director of Graduate Studies in Art History: Alexander Nemirov

Professors: Wanda M. Corn (American Art, on leave Autumn), Elliot Eisner (Art Education), David Hannah (Painting, on leave Autumn), Matthew S. Kahn (Design), Richard Randell (Sculpture), Paul V. Turner (Architectural History)

Associate Professors: Kristina Branch (Painting/Drawing), Michael Marrinan (18th- and 19th-century European Art, on leave Autumn), Jody Maxmin (Ancient Art), Melinda Takeuchi (Japanese Art), Richard Vinograd (Chinese Art)

Assistant Professors: Paolo Berdini (Renaissance Art, on leave Autumn), Scott Bukatman (Film Studies), Enrique Chagoya (Painting/Drawing, on leave Autumn), Leah Dickerman (Modern Art, on leave Winter, Spring), Pamela Lee (Contemporary Art, on leave 2000-01), Alexander Nemirov (American Art, on leave Autumn)

Affiliated Professor: John H. Merryman (Art and Art History, Law)
Senior Lecturer: Joel Leivick (Photography)
Lecturers: Kevin Bean (Painting/Drawing), Ellen Handler Spitz John Zarobell (Modern/Contemporary Art)
Visiting Assistant Professor: Frazer Ward (Modern/Contemporary Art)

The department offers courses of study in: (1) the history of art, and (2) the practice of art (studio), with major concentrations in painting and drawing, sculpture, design, and photography. The undergraduate program of the department is designed to introduce students to the humankind study of the visual arts. The courses are intended to increase an understanding of the meaning and purpose of the arts, their historical development, their role in society, and their relationship to other humanistic disciplines such as literature, music, and philosophy. The work in classroom and studio is designed to intensify visual perception of the formal and expressive means of art and to encourage insight into a variety of technical processes.

The Iris and B. Gerald Cantor Center for Visual Arts at Stanford University is a major resource for the department. The center offers a 22,000 object collection on view in rotating installations in 18 galleries and the Rodin Sculpture Garden, and a diverse schedule of special exhibitions, educational programs, and events. Through collaborations with the teaching program, student internships, and a range of student activities, the center provides a rich resource for Stanford students.

ART HISTORY

Over the past two decades the study of Art History has changed dramatically to include the study of art forms made far afield from the traditional core of Western Europe and to re-examine its objects in light of new critical frameworks. The Art History program promotes a plurality of approaches to the study of art by encouraging majors to construct a program of study drawn from the broad offerings of the Art History curriculum and the university-at-large.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

Requirements for the Art History major at Stanford depend upon a simplified chronological framework not linked directly to the time periods usually employed in the description of events in the history of Europe. The chronological categories for the major in Art History at Stanford are: pre-classical, classical, medieval, premodern, and modern. At the same time, the faculty has recognized the need to describe geographically the field of inquiry appropriate to Art History. To that end, it has divided the Art History major into four large regions: European; Post-Columbian American; Asian; and the native arts of Africa, Oceania, and the Americas (AOA).

The requirements for the major in Art History introduce students to the general methods of the field (Foundation), help them become familiar with a broad cross-section of its contents (Proficiency and Overview), and encourage them to concentrate in an area where they will develop sharp critical skills and the good habits of sound scholarship (Concentration and Research).

All courses for the major in Art History must be taken for a letter grade.
FOUNDATION COURSES

Foundation courses introduce the specialized vocabulary, forms of analysis, and principal themes of Art History. To this end, Introduction to the Visual Arts (Art History 1) is essential and should be taken early in the student’s career. This course also fulfills Stanford's Writing in the Major requirement (WIM). Other foundation-level courses introduce the broad, but nonetheless specialized, concerns of Asian Art (Art History 2), Architecture (Art History 3), and Film (Art History 4). For the major in Art History, students are required to take Art History 1 and at least one other foundation-level course. Interested students can elect to take more than two Foundation Courses, but no more than three count towards fulfillment of the bachelor’s degree.

PROFICIENCY REQUIREMENTS

The history and criticism of works of art are written in many languages and published in many cultures. Majors in Art History are expected to be able to access some of this work, and in accordance with the University’s language requirements for the bachelor’s degree, students must complete one year of college-level study (or the equivalent) in a foreign language. However, students planning to pursue the study of Art History in graduate school are strongly encouraged to master at least a reading-level proficiency in a second foreign language, and should consult with their adviser about planning this part of their program.

Works of art, by their nature, are material things rather than words, and in this way Art History differs from most of the other humanistic disciplines. In the belief that one cannot understand the physical qualities of works of art without some direct experience with the materials, majors in Art History are required to complete at least one introductory course in Studio Art using the “traditional” materials of painting, sculpture, drawing, photography, or print-making.

OVERVIEW

Because works of art are not simply made and used, but distributed and discussed over wide areas and long periods of time, majors are required to become familiar with a broad spectrum of the overall field of Art History. In the best possible scenario, majors would fulfill this requirement by the middle of their junior year.

Majors are required to take five courses of overview for a total of 20 units, and all must be taken for a letter grade. These courses must be in three different chronological periods and at least three different geographical areas (see above). So, a sample program might include three courses in Asian art (medieval, premodern, and modern), one course in European art, and another in AOA. To aid the student’s selection of overview courses, every Art History offering in the catalogue carries a “tag” that identifies its chronological and geographic focus (such as CL-EUR for “classical European”). Questions about the overview requirement should be directed to the student’s adviser.

CONCENTRATION

Most students of Art History have a “favorite” period, artist, or type of art that has drawn them to the major, and the faculty wants to encourage students to explore this interest in the widest possible manner. By the Winter Quarter of their junior year, majors are expected to file a statement with the Director of Undergraduate Studies, signed by their academic adviser, which describes the area of concentrated study and lists the courses to be taken over the next five quarters to complete the proposed concentration. If a student plans to attend an Overseas Study campus, care must be taken to ensure that any courses intended to contribute to the Art History concentration are approved in advance by their adviser.

A concentration can be defined in several ways: by a specific time-period (medieval art in Europe); by a specific medium (the history of photography); or tied together by a single theme (such as “art and technology,” or issues of gender and visual culture). Concentrations are individual programs of study worked out in discussions between a student and his or her adviser. In general, they are comprised of at least four courses in Art History, of which three must be in addition to courses fulfilling the Overview Requirements (see above).

CONTEXT

Because works of art are produced for many complex reasons, and their forms are affected by a wide range of cultural forces, majors in Art History are encouraged to explore parallel or contemporary developments in literature, history, philosophy, as well as science and the performing arts. As part of defining their area of concentration (see above), students and their advisers identify several upper-division courses in other departments, whose subject matter is directly related to their area of concentration and thus appropriate as context courses. To satisfy the context requirement for the bachelor’s degree in Art History, at least two such context courses, approved in advance by one’s adviser, must be taken for a letter grade.

RESEARCH

An essential component of the Art History major consists of helping students become familiar with works of art and with writing about them. This entails a familiarity with techniques of library research, a facility with the mechanics of art historical scholarship, practice in focusing research on clearly-defined problems, and the experience of presenting one’s findings in written or oral form. Research requirements are designed to ensure that all majors in Art History leave Stanford having mastered these essential skills.

All majors are required to attend an orientation session presented by the professional staff of the Art Library, which introduce the many tools of research and reference available on campus or through the internet. In addition, majors are allowed the special privilege of placing materials on reserve in the Art Library to facilitate their research for seminars or other projects, such as the honor’s theses (see below).

All majors are required to include within their program of study at least two research-oriented seminars that entail preparation of a research paper, a formal presentation, or both. In some cases, students are allowed to substitute a “colloquium” for one of these seminars, although in such cases it is understood that the course requirements must include a substantial research component.

CAPSTONE EXPERIENCE

The faculty are committed to offering every major a culminating (or “capstone”) experience to their investment of time and energy in the study of Art History. The most intense and sustained kind of capstone experience consists of exploring in depth, across several quarters of study, and in close collaboration with several professors, a single topic of great interest to the student. The most conducive vehicle for this kind of scholarly experience is writing an honor’s thesis. However, not every student wants to undertake such a personal commitment nor should they; but every major is required to elect at least one of the capstone options.

HONOR’S THESIS

The minimum requirements for admission to the honors program in the department is a GPA of 3.5 overall, and at least 3.5 in Art History courses. Students wishing to write an honor’s thesis must announce their intention by the middle of their junior year, and enlist at least one member of the faculty to serve as thesis adviser. It is imperative that the thesis adviser be committed to being on campus and in residence during the candidate’s senior year.

In concert with this adviser (who need not be the student’s academic adviser), candidates for the honors program must submit for consideration by the entire faculty a short (five page) thesis proposal, along with at least one completed paper that demonstrates his or her ability to conceptualize issues and to write about them. This material must be submitted to the department no later than the third week of Spring Quarter of the candidate’s junior year so that it can be read, discussed, and voted upon at the faculty’s regular meeting in early May. A candidate is accepted into the honor’s program by a simple majority.

Once admitted to the honor’s program, a student works with his or her thesis adviser to define the scope of the study, to establish a research and writing timetable, and to enlist one other faculty member to serve as the thesis reading committee. To aid the process of research and writing, students preparing an honor’s thesis are paired with a graduate student.
mentor. The summer between junior and senior years is usually devoted to refining the topic and pursuing any off-campus research. During the student's senior year, it is customary to register for up to 8 units of "Individual Work in Art History" (Art History 240) while research and writing of the thesis is advanced. Students should be aware that they can apply for GRO research grants to help finance trips or expenses relative to preparing for the research of their honor's thesis.

Students and thesis advisers should plan their schedule of work so that a complete and final manuscript is in the hands of each member of the thesis reading committee by the seventh week of the student's final quarter at Stanford. Although the thesis adviser assigns a letter grade to the completed work, both faculty readers must approve the thesis for honors before the student is qualified to graduate with that distinction.

SENIOR SEMINAR:
The department offers once a year, usually in the Spring Quarter, an advanced 5-unit seminar reserved for graduating seniors. However, students electing to write an honor's thesis in Art History may petition to take the senior seminar in their junior year. Majors who might not be in residence during the Spring Quarter of their senior year may also petition to enroll in the senior seminar during their junior year. Although the specific topic varies from year to year, the idea is that this seminar will be an opportunity for seniors to synthesize their experience of prior courses in Art History, work closely and at a high level with a faculty member in the setting of a small group, and be encouraged to engage large issues related to the field that they might not otherwise be able to explore. This course must be taken for a letter grade, and does not count as one of the two seminars described under Research Requirements (see above).

SUMMARY OF REQUIREMENTS

<table>
<thead>
<tr>
<th>Courses Required</th>
<th>in Art History</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foundation:</strong></td>
<td></td>
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<tr>
<td>Art History 1 and one other Introductory level course, either Art History 2, 3 or 4</td>
<td>2</td>
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<tr>
<td><strong>Proficiency:</strong></td>
<td></td>
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<tr>
<td>One year of college-level study in a foreign language</td>
<td>0-3</td>
<td></td>
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<tr>
<td>One introductory course in Studio Art</td>
<td>1</td>
<td></td>
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<tr>
<td><strong>Overview:</strong></td>
<td></td>
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</tr>
<tr>
<td>Five art history courses taken in three different chronological periods (Pre-Classical, Classical, Medieval, Premodern and Modern) and at least three different geographical areas (America, Europe, Asia, and AOA)</td>
<td>5</td>
<td></td>
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<tr>
<td><strong>Concentration:</strong></td>
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<tr>
<td>Four art history courses that form an area of concentration within the field to be approved by the student's adviser. Three of these courses must be taken in addition to those counted for overview requirements.</td>
<td>3</td>
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<tr>
<td><strong>Context:</strong></td>
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<tr>
<td>Two upper-division courses in other departments related to the student's area of concentration and to be approved by the adviser</td>
<td>2</td>
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<tr>
<td><strong>Research:</strong></td>
<td></td>
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<tr>
<td>Two research-oriented courses, either two seminars or one seminar and one colloquium</td>
<td>2</td>
<td></td>
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<tr>
<td>Capstone:</td>
<td></td>
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<tr>
<td>The Senior Seminar, an advanced 5-unit course</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total number of courses</td>
<td>13</td>
<td>3-6</td>
</tr>
</tbody>
</table>

MINORS

ART HISTORY

A student declaring a minor in Art History must complete 25 units of course work in one of the following four tracks: Open, Modern, Asian, or Architecture. Upon declaring the minor, students are assigned an adviser with whom they plan their course of study and electives. A proposed course of study must be approved by the adviser and placed in the student's departmental file. Only one class may be taken for credit outside of the Stanford campus (this includes the Stanford Overseas Studies Programs).

Requirements for the Open Track: Art History 1 plus five lecture courses, colloquia, or seminars in any field.

Requirements for the Modern Track: Art History 1 plus five lecture courses, colloquia, or seminars in any aspect of 19th- to 20th-century art.

Requirements for the Asian Track: Art History 2 plus five lecture courses, colloquia, or seminars in Asian art (Art 1 may be one of the five courses.)

Requirements for the Architecture track: Art History 3 plus five lecture courses, colloquia or seminars in architectural history (Art History 1 may be one of the five courses.)

FILM

A minor in Film Studies requires four core courses and three additional courses (electives) for a total of seven courses. The required core courses are comprised of Introduction to Film Study (Art History 4), Film Theory and Formal Analysis (Art History 263), and either History of World Cinema I or II (Communication 141A or B), and a fourth course in a national cinema or film history. These introduce concepts and contexts fundamental to an understanding of the medium. Electives can be selected from courses in other departments approved for the Film Studies minor by the coordinator and core faculty for their stress on methods of film analysis. These may include courses in national cinemas, film genres, experimental and documentary film, or film theory. Courses in which film study is not a central focus may not be eligible for credit in the minor.

Upon declaring the minor, students are assigned an adviser with whom they plan their course of study and electives. A proposed course of study must be approved by the adviser and placed in the student's departmental file. Only one class may be taken for credit outside of the Stanford campus (this includes the Stanford Overseas Studies Programs)

GRADUATE PROGRAMS

MASTER OF ARTS

The Department of Art and Art History offers A.M. and Ph.D. degrees. The A.M. is granted as a step toward fulfilling requirements for the Ph.D. The department does not admit students who wish to work only toward the master's degree.

The University's basic requirements for the master's degree are set forth in the "Graduate Degrees" section of this bulletin.

Completing the University's requirements for an A.B. degree in the History of Art, or equivalent training, is required of students entering a program of study for the A.M. The required curriculum for entering students is determined by the Director of Graduate Studies through an evaluation of transcripts and records during an individual meeting scheduled with each student prior to the opening of Autumn Quarter to discuss course deficiencies.

Requirements for the Degree—The requirements for the A.M. degree in the History of Art are:

1. **Residence**: completing a minimum of three full-tuition quarters or the equivalent in partial-tuition quarters of graduate registration.

2. **Units**: completing a total of at least 36 units of graduate work in the history of art in courses at the 200 level, including a seminar in art historiography/visual theory.

3. **Languages**: reading knowledge of two foreign languages, preferably German and French or Italian. Students in Chinese and Japanese art are ordinarily expected to demonstrate reading competence in modern and classical Chinese or Japanese depending on the student's area of focus. Final determination is made in consultation with the student's primary adviser.

4. **Papers**: submission for consideration by the faculty of two term papers from among those written during the year.

5. **Area Coverage**: demonstration to the faculty, by course work and/or examination, that the student has adequate knowledge of the major areas of the history of art.

DOCTOR OF PHILOSOPHY

The University's basic requirements for the Ph.D. degree are set forth in the "Graduate Degrees" section of this bulletin. The following are departmental requirements.
**Joint Ph.D. in Art History and Humanities**

The department participates in the Graduate Program in Humanities leading to the joint Ph.D. in Art History and Humanities. For a description of this program, see the "Interdisciplinary Studies in Humanities" section of this bulletin.

**Practice of Art (Studio)**

**Undergraduate Programs**

**Bachelor of Arts**

The program is designed to develop in-depth skills in more than one area. It emphasizes the expressive potential of an integration of media, often via a cross-disciplinary, interactive path. Through collaboration and connections with scientists, engineers, and humanities scholars, the program addresses a breadth of topical and artistic concerns central to a vital undergraduate education.

Medium-based courses in digital art, drawing, painting, photography, and sculpture, along with a basic design course, introduce students to visual fundamentals. The student is required to take courses at Level 1 before moving to the intermediate Level 2 where investigations of content are emphasized. At this level, the student focuses on a range of subject matter from historical motifs (figure, still life, landscape) to contemporary ideas in design. After fulfilling Level 2 requirements, the student selects courses at Level 3, which feature combined practices. Level 3 courses are designed to stretch the student's understanding of materials and techniques. Experimental and challenging in nature, these courses cross area boundaries. Level 4 courses comprise a senior capstone experience. The Advanced Undergraduate Seminar emphasizes the investigation of visual concepts interpreted by a single medium, by cross-practices, or by collaboration among students working in a variety of materials. This seminar gives the student an opportunity to be exposed to the work of other majors in a critique-based forum directed by a visiting artist or critic. Advanced courses with a particular focus such as design, photography, or painting are offered on a rotational basis. Independent study supervised by a member of the permanent faculty is also available to the advanced student.

Students are encouraged to move through the requirements for the major in the sequence outlined. Levels 1, 2, 3, and 4 describe a sequence of course choices, not to be confused with the years freshman, sophomore, junior, and senior. Students are exposed to a range of practices early in their development in order to have a good basis of comparison if they choose to concentrate on a particular medium. This sequence of courses also broadens the students’ skills and enables them to combine materials and methods.

The major program in the Practice of Art (Studio) must total 65 units and include the following:

1. Four Level 1 courses (12-13 units) from Art (Studio) 50, 60, 70, 140, 145, 173. Two courses are to be completed before moving to Level 2.
2. Two Level 2 courses from Art (Studio) 141, 146, 160, 170, 175 (6 units) are to be completed before taking Level 3 courses.
3. Two to three Level 3 courses (6-9 units) from Art (Studio) 148, 149, 152, 169, 172, 174, 175A, 176, 271 are to be completed before taking Level 4 courses.
4. Two to three Level 4 courses (6-9 units) from Art (Studio) 142, 147, 153, 175B, 248, 249, 268, 269, 270.
5. Five art history courses (21 units). Art History 1 is taken as the basic course, followed by four additional courses. At least one of the courses must be in the modern art series (Art History 120A through 123A).
6. Electives, any level (7-11 units). As many as 6 elective units may be earned from workshops, internships, and independent study projects, supervised by a member of the permanent faculty. All units must be approved by the adviser prior to taking the workshop, internship, or independent study.
7. Total units: 65. All required course work must be taken for a letter grade; courses may not be taken satisfactory/no credit.
units earned by placement tests or advanced placement work in secondary school are not counted within the 65 units.
8. Majors are required to spend one quarter or summer pursuing studio interests at a site off campus. This requirement may be fulfilled in a number of ways including, but not limited to, Overseas Studies Programs, independent study sponsored by URO grants, the Haas Center, and so on. Students must meet with the Director of the Studio Art Program to discuss how the requirement will be met.
9. Each undergraduate major is required to attend an Art Library orientation session. Majors are to consult with the Art Library staff for scheduling information.
10. Studio majors are required to meet with both their adviser and the department’s undergraduate curriculum adviser during the first two weeks of each quarter to have course work approved and to make certain they are meeting degree requirements. The adviser’s role is important both in regard to guiding the student’s decisions within the program as well as in discussing plans for summer study and graduate work. An adviser is chosen by the student or assigned by the department.

Transfer Credit Evaluation—Upon declaring a Studio Art major, a student transferring from another school must have his or her work evaluated by a Department of Art and Art History adviser. A maximum of 13 transfer units are applied toward the 65 total units required for the Studio Art major. A student wishing to have more than 13 units applied toward the major must submit a petition to the adviser and then have his or her work reviewed by a department committee.

MINORS
The minor program in the Practice of Art (Studio) must include the following:
1. Two Level 1 courses (6-7 units) from Art (Studio) 50, 60, 70, 140, 145, 173 before taking Level 2 courses.
2. Two Level 2 courses (6 units) from Art (Studio) 141, 146, 160, 170, 175 before taking Level 3 courses.
3. Two Level 3 and/or Level 4 courses (6 units) from Art (Studio) 142, 147, 148, 149, 152, 153, 169, 172, 174, 175A, 175B, 176, 248, 249, 268, 269, 270, 271.
4. Three art history courses (13 units), including Art History 1 and one course from the modern art series, Art History 120A through 123B.
5. Total units: 31. All required course work must be taken for a letter grade; courses may not be taken satisfactory/no credit. University units earned by placement tests or advanced placement work in secondary school are not counted within the 31 units.
6. Each undergraduate minor is required to attend an Art Library orientation session. Minors are to consult with the Art Library staff for scheduling information.
7. Minors are required to meet with both their adviser and the department’s undergraduate curriculum adviser during the first two weeks of each quarter to have course work approved and to make certain they are meeting degree requirements.

OVERSEAS CAMPUS CREDIT
A minimum of 52 of the 65 units required for the Studio Art major and a minimum of 21 of the 31 units required for the Studio Art minor must be taken at the Stanford campus. In all cases, a student should meet with his or her adviser before planning an overseas campus program.

GRADUATE PROGRAMS
MASTER OF FINE ARTS
Programs for the M.F.A. degree are offered in painting, sculpture, new genres, photography, and product or graphic design.

PROGRAM IN PAINTING, SCULPTURE, NEW GENRES, AND PHOTOGRAPHY
The program provides a rigorous and demanding course of study designed to challenge and encourage advanced students. Participants are chosen for the program on the basis of work that indicates artistic individuality, achievement, and promise. Candidates should embody the intellectual curiosity and broad interests appropriate to, and best served by, work and study within a university context.

Admission Requirements—
1. Applicants must have an A.B. or B.S. from an accredited school. It is expected that the applicant have a strong background in studio art, either an undergraduate degree or at least three years of independent studio practice.
2. Applications and portfolios for the studio program must be submitted by January 15. Students accepted to the program are admitted for the beginning of the following Autumn Quarter. No applicants for mid-year entrance are considered.
3. Portfolio Specifications: 20 slides of creative work. Some of these can be drawings if relevant to the overall project. Send in a Kodak Universal carousel; no actual work is accepted. All slides must be labeled with the applicant’s name and an accompanying slide list must be included indicating the size, date, and medium of each work. If the applicant wants the portfolio returned, a stamped, self-addressed container must be included.

Requirements for the M.F.A. Degree—
1. Completing a minimum of two years (six quarters) of graduate work in residence or its equivalent at Stanford.
2. Completing 48 units of study. Students must discuss their programs of study with the department’s senior administrator to ensure that the most favorable registration arrangement is made.
3. Six quarters of the Master’s Project, which includes two weekly seminars (the Object Seminar and the Concept Seminar) and Studio Practice, which is an individual tutorial with a selected member of the faculty. In addition, three courses of academic electives are required in the first year. These courses can be chosen from a large variety of disciplines in consultation with the faculty adviser.
4. The student is expected to pass three faculty reviews: (1) at the end of the first quarter (anyone judged to be making inadequate progress is placed on probation and will require an additional review at the end of the second quarter), (2) at the end of the third quarter, and (3) at the time of the M.F.A. exhibition. The purpose of these reviews is to evaluate development and to assess the progress of the student.
5. During the final quarter in the program, students must write a thesis paper addressing the development of their work over the two-year period at Stanford. Participation in the M.F.A. exhibition at the end of the year is required.
6. All students, regardless of their source of funding, are required to assist with the department’s teaching program for a minimum of eight hours per week over the period of six quarters; the particulars of this assignment are at the department’s convenience.
7. The Studio faculty reserve the right to make use of graduate paintings, sculpture, and photographs in exhibitions serving the interests of the graduate program.

Graduate students must remain in residence at Stanford for the duration of the program.

THE GRADUATE PROGRAM IN DESIGN
Working jointly, the departments of Art and Art History, and Mechanical Engineering offer graduate degrees in product and visual design. A large new physical environment, the Design Yard, provides professional-caliber studio space and well-equipped shops. Flexible programs may include graduate courses in fields ranging from graphic to engineering design, typography to biotechnology, marketing to microcomputers. The program centers on a master’s project and may also include work in advanced art and design. The program is structured to balance independent concentration with rich utilization of the University and the community, and personal interaction with the students and faculty of the graduate Design program. Cross-disciplinary interaction is encouraged by a four-person graduate Design faculty.

An A.M. degree with a specialization in Design is offered to qualified students who prefer to participate in the graduate program for only one year.
Admission—The M.F.A. degree program requires:
1. Applicants must have an A.B. or B.S. from an accredited school. It is expected that the applicant will have a strong background in studio art, either an undergraduate degree or at least three years of independent studio practice.
2. Portfolio Specifications: twelve slides or photographs of creative work. All slides must be labeled with the applicant’s name. If a carousel is sent, an accompanying slide list must be included indicating the size, date, and medium of each work; otherwise, slides should be labeled with the same information and sent in the standard cardboard box received from processing. If applicants want portfolios returned, a stamped, self-addressed container must be included.

Requirements for the Degree—The M.F.A. degree with a specialization in design requires:
1. Completing a minimum of two years (six quarters) of graduate work in residence or its equivalent at Stanford.
2. Completing in the first year 54 units of course work chosen in consultation with an adviser. At least 18 of the 54 units must be in Art (Studio) 360A, B, C and Mechanical Engineering 211A, B, C.
3. Participating in a weekly seminar in which the student’s work is criticized and discussed in detail.
4. As a part of their training for the M.F.A. degree, all students, regardless of their source of funding, are required to assist with the department’s teaching program for a minimum of eight hours per week over the period of six quarters; the percentage of work assigned in a given quarter is at the department’s convenience.

Graduate students must remain in residence at Stanford for the duration of the program.

ART EDUCATION
Information concerning the A.M. in Teaching, Doctor of Education, Ph.D. in Education, and Teaching Credential (Single Subject-Secondary) degrees and programs may be secured from the Office of the Dean of the School of Education.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

HISTORY OF ART

BASIC

1. Introduction to the Visual Arts—Introduction to the critical problems of understanding, analyzing, and writing about the visual arts. The approach is multicultural and topical rather than historical. Discussion sections. GER:3a (DR:7) (WIM)
   5 units, Aut (Lewis)
   Spr (Berding)

2. Art and Culture in Asia—The religious and philosophical ideas and social attitudes of India, China, and Japan and how they are expressed in the architecture, painting, woodblock prints, sculpture, and in such forms as garden design and urban planning. Discussion sections. GER:3a,4a (DR:2 or 7)
   5 units, Win (Vinograd)

3. Introduction to the History of Architecture—Selective survey of architecture from antiquity to the 20th-century; mostly Western with some non-Western topics. For each period, specific buildings and general principles relevant to the study of architecture are examined.
   5 units (Turner) not given 2000-01

4. Introduction to Film Study—Develops basic aesthetic and conceptual analytic skills with relevance to cinema, studying formal, historical, and cultural issues. Familiar models of narrative cinema are mixed with alternative structures, documentary, and experimental forms. Issues of cinematic “language” and visual perception, representations of gender, ethnicity and sexuality. Weekly screenings. GER:3a (DR:7)
   4 units, Win (Bukatman)

STANFORD INTRODUCTORY SEMINARS

   4 units Win (Corn)

61Q. Stanford Introductory Seminar: Comics—A Lively Art—Preference to sophomores. The history and aesthetics of comics, a medium that spans the 20th century, existing in dynamic relation to emerging mass media (e.g., cinema) and to modernist and postmodernist aesthetic and narrative practices. The innovators in comic strips (humorous and dramatic), superheroes, Heavy Metal, undergrounds and independents, political intervention, autobiography, and (of course) manga. Required assigned film viewings.
   4 units, Aut (Bukatman)

OVERVIEW COURSES

THE CLASSICAL WORLD

101/301. Archaic Greek Art— (Same as Classics 100A/200A.) The development of Greek art from Protogeometric beginnings to the decades preceding the age of Pericles. (PC-EU) GER:3a (DR:7)
   4 units, Aut (Maxmin)

102/302. Classical and Hellenistic Greek Art—The formation, in 5th-century Athens, of the classical ideal and its development and diffusion in the centuries that followed. (CL-EU) GER:3a (DR:7)
   4 units, Win (Maxmin)

103/303. Greek Painting—Introduction to the study and appreciation of Greek vases and their painters, especially the masters of Athenian black- and red-figure who flourished in the culturally rich and volatile era of the tyrant Peisistratos and his sons. (CL-EU)
   4 units (Maxmin) not given 2000-01

104/304. Roman Art— (Same as Classics 100C/200C.) Introduction to the rich and varied art and architecture of Rome from the Etruscans to the Late Empire. (CL-EU) GER:3a (DR:7)
   4 units, Spr (Maxmin)

THE MEDIEVAL WORLD

105/305. Sites and Images of Power in 12th-Century Europe—Romanesque art and architecture in Western Europe, 1095 to 1200: structuring a new visual discourse to shape and respond to the experiences of political, spiritual, and intellectual expansion resulting from the Crusades, pilgrimage, and new learning in the schools. How spatial environments were built and systems of visual discourse designed within the ideological contexts generated by monastic and feudal institutions in centers such as Cluny, Cîteaux, Moissac, Mont Saint-Michel, Vézelay, Winchester, Canterbury, Durham, Santiago de Compostela, and Monreale. (MED-EU)
   4 units (Lewis) not given 2000-01

107/307. Age of Cathedrals—Gothic art and architecture in Western Europe, 1150 to 1500. The structuring of a “modern” visual discourse within the ideological framework of a new monarchical Church and State, emerging towns and universities, the rise of literacy, the cultivation of self, and the consequent shifts in patterns of art patronage, practice,
Fouquet, and Bosch. The shift from court patronage to entrepreneurial art in the 17th century under the impact of secularization and Westernization, Russian art and architecture. The evolution of Muscovite architecture in the 17th century under the impact of secularization and Westernization, culminating with the reign of Peter the Great.

108/308. Late Medieval "Realism": 15th-Century French and Netherlandish Painting—Restructuring representation and reception in the art of the Limbourg brothers, Van Eyck, Van der Weyden, Van der Goes, Fouquet, and Bosch. The shift from court patronage to entrepreneurial art markets; the new status of the image, artist, viewer, and self; and the problematical premodern context of the end of the Middle Ages. (MED-EU)

4 units (Kollmann)

109/309. Apocalypse: Reading Medieval Images—The multilayered relationships between textual images and their reader-viewers in medieval illuminated Apocalypse manuscripts, and how their production and dissemination provided critical cultural mechanisms for the creation of new technologies of the self. Within this framework of subjectivity, medieval theories of vision invested images with the power to articulate and activate dominant ideological positions regarding the self, society, and the "other." The medieval Apocalypse became a powerful paradigm for the definition of such problematical medieval experiences as the Crusades, anti-Judaism, and expectations of the world's end. (MED-EU)

4 units (Lewis) not given 2000-01

EUROPE 1400-1900

110/310. Renaissance Painting—Survey of 15th- and 16th-century painting in Rome and Florence in light of the artistic practices and cultural attitudes that characterized the visual culture of the Renaissance. The circumstances of patronage, secular and religious, set the framework through which important artistic episodes of Renaissance imagery, from the revival of antiquity to Christian neo-Platonism, find historical explanation. Works by Masaccio, Masolino, Beato Angelico, Filippo Lippi, Paolo Uccello, Ghirlandaio, Piero di Sozimo, Mantegna, Piero della Francesca, Botticelli, and Leonardo. (EM-EU) GER:3a (DR:7)

4 units, Win (Berdini)

112/312. The Venetian Renaissance—Venetian painting of the Renaissance in light of the exchange between the center and periphery that characterizes Venice's visual culture. After the acquisition of land dominions, the terraferma, in the first half of the 15th century, Venice, the center, promised forms of interaction (social, political, and cultural) among the diverse regions of the periphery. By renewing, absorbing, and valorizing the characteristics of the local schools of painting, Venice realized its own Renaissance. The pictorial genre of the pastoral is a typical reception between the urban center and the agrarian periphery. Focus is on the works of Carpaccio, Bellini, Giorgione, Savoldo, Lotto, Titian, Veronese, Bassano, and Tintoretto. (EM-EU)

4 units (Berdini) not given 2000-01

114/314. Renaissance Women—The ways in which models of feminine beauty were constructed and processed in the literary and visual culture of the Renaissance. Whether, in the guise of goddesses, courtesans, or others, the feminine image partook of a discursive arena in which its social, mythological, and erotic valencies required readers and beholders to evolve new forms of response. Reception theory and gender studies offer the theoretical framework for discussing artistic forms from Titian's paintings to Petrarchan poetry. (EM-EU)

4 units (Berdini) not given 2000-01

115/315. Renaissance Architecture, 1420-1580—Established first in Florence with Brunelleschi's buildings and Alberti's theory, Renaissance architecture produced a variety of typological and decorative innovations throughout Italy. The circumstances of patronage and context, physical or cultural, are examined to address the formal and iconographical novelties of a highly theoretical architecture. Context and theory are the privileged criteria according to which works by Brunelleschi, Michelozzo, Francesco di Giorgio, Bramante, Peruzzi, Raphael, Sangallo, Giulio Romano, Michelangelo, Alessi, Sanmicheli, Sansovino, Palladio and Vignola are studied. (EM-EU)

4 units (Berdini) not given 2000-01


4 units (Turner) not given 2000-01

117/317. Baroque Painting—The visual culture of Italy, France, and Spain, 1590-1660, focusing on the works and legacies of Carracci, Caravaggio, Guercino, Guido Reni, Poussin, and Velasquez. Theoretical issues (e.g., Naturalism). Emphasis is on what constitutes a Baroque image and what are the conditions of its beholding. (EM-EU)

4 units (Berdini) not given 2000-01

121/321. 18th-Century Art in Europe, ca. 1660-1780—The major developments in painting across Europe from the High Baroque illusionism of Bernini (Rome) and the founding of the French Academy (Paris) to the international revival of antiquity during the 1760s, with parallel developments in Venice, Naples, Madrid, Bavaria, and London. Lectures situate shifts in themes and styles amidst the emergence of new viewing publics. Artists: the Tiepolos, Giordano, Batoni, and Mengs; Ricci, Pellegrini, and Thornhill; Watteau and Boucher; Chardin and Longhi; Reynolds and West; Hogarth and Greuze; Vien, Fragonard, and the first works by David. Additional hour discussion each week for graduate students. (EM-EU)

4 units (Marrinan) not given 2000-01

122/322. Painting in the Age of Revolution—Survey of painting in Europe within the context of the French Revolution and its aftermath. Lectures align ruptures in the traditions of representation with respect to shifting social formations and political events. Artists: David and his students; Gros and the painters of Napoleon; Gericauld, Blake, Fuseli, and Goya; Turner and Constable; Friedrich, Runge, and the Nazarenes; Ingres and Delacroix. Additional hour discussion each week for graduate students. (M-EU) GER:3a (DR:7)

4 units, Win (Marrinan)

124/324. The Age of Naturalism, ca. 1830-1874—The origins, development, and triumph of naturalist painting in Europe. Lectures underscore the creative tensions between the traditional ambitions of painting and the challenge of new "modern" subjects and the emerging practice of working in the open air. Artists: Corot, Rousseau, and the painters of Barbizon; Courbet, Millet, and Daumier; the pre-Raphaelites; Manet and his circle; the early works of Monet, Renoir, Degas, and friends. Additional hour discussion each week for graduate students. (M-EU) GER:3a (DR:7)

4 units, Win (Marrinan)

126/326. Post-Naturalist Painting—How conceptual models from language, literature, new technologies, and scientific theory affect picture-making following the collapse of the radical naturalism that characterized European painting of the 1860s and early '70s. Bracketed in France by the first Impressionist exhibition (1874) and the first public acclamation of major canvases by Manet and Monet (1869), the related developments in England, Germany, and Austria. Artists: the Impressionists and Cezanne; Moreau, Redon, and Rops; Van Gogh and the Fauves; Gauguin, Les XX, and Munch; Seurat and Signac; Puvis de Chavannes, Burne-Jones, Whistler and Klimt; Horta, van de Velde and...
Guimard; Beardsley, Vallotton, and Toulouse-Lautrec. Additional hour discussion each week for graduate students. Recommended: some prior experience with 19th-century art. (M-EU)

4 units (Marrinan) not given 2000-01

BRITAIN AND AMERICA 1600-1900

130/330. Art in America and Britain, 1670-1825: Culture and Politics—Interdisciplinary study of major themes and genres of British and early American art. Focus is on art in relation to the French and Indian Wars, the American Revolution and the invention of American national identity, and the art of indigenous peoples, particularly the Iroquois. Close readings of works of art. Artists: Copley, West, Trumbull, Allston, Hogarth, Wright of Derby. (EM-AM) GER:3a (DR:7)

4 units, Aut (Nemerov)

131/331. American Art and Culture, 1670-1860—The development of portraiture and history painting in the colonies and of landscape and genre painting in the new nation. The difficulties of establishing artistic communities and patronage in a new society, the exchange and interaction with Europe, and the search for a uniquely American expression. Focus is on Copley, Peale, West, Trumbull, Stuart, Mount, Bingham, and the Hudson River School. (EM-AM)

4 units, Aut (Corn) not given 2000-01

133/333. American Art and Culture in the Gilded Age, 1865-1910—Interdisciplinary study of art, literature, patronage, and cultural institutions of the late 19th century. Aestheticism, conspicuous consumption, the grand tour, and the expatriate experience. The period’s great collectors, taste makers, and artists: Thomas Eakins, Winslow Homer, Mary Cassatt, James Whistler, John Singer Sargent; Albert Pinkham Ryder, William Harnett, and John Peto. (MOD-AM)

4 units (Corn) not given 2000-01

136/336. Decadence and Reserve: Visual Art in Britain, 1880-1915—In-depth study of the great artists working in Britain, 1880-1915, including John Singer Sargent, Aubrey Beardsley, Walter Sickert, Gwen John, etc. Emphasis is on the art, and on the literary productions of the time: the Bloomsbury writers; Arthur Conan Doyle, especially his Sherlock Holmes. The era’s imperial and gender politics, manifested in the Boer War and the women’s suffrage movement. (MOD-EU)

4 units, Win (Nemerov)

MODERN EUROPE


4 units (Berdini, Turner) not given 2000-01

141/341. The Invention of Modern Architecture—The creation and development of new architectural forms and theories, from the late 18th to the early 20th centuries, mainly in Europe but also in America. Emphasis is on the responses to new materials, technologies, and social conditions, and how they shaped the architecture of our own time. Recommended as preparation for 142. GER:3a (DR:7)

4 units, Aut (Turner)

142/342. Varieties of Modern Architecture—The development of competing versions of "modern" and "post-modern" architecture and design in Europe and America, from the early 20th century to the present. Recommended: 141. GER:3a (DR:7)

4 units, Win (Turner)

143/343. A History of Photography—Surveys photography from its invention in the 19th century to the present. Working from images in the collection of the Stanford Museum, the San Francisco Museum of Modern Art, and important primary and critical texts, the focus is on the nature of photographic representation and the changing status of photography as an artistic and social practice. (MOD-EU/AM)

4 units (Dickerman) not given 2000-01

144/344. Modernism and Abstraction—The various histories, ideologies, and meanings of abstraction in 20th-century art Cubism, German Expressionism, suprematism, Constructivism, Neo-Plasticism, Abstract Expressionism, Brutalism, hard-edge abstraction, Minimalism, and process art. (MOD-EU)

4 units (Dickerman, Lee) not given 2000-01

145/345. Making the Modern: European Art, 1890-1914—What is modernism? The avant-garde practice, 1890-1914, as a spectrum of complex responses to issues of modernization (the growth of the metropolis, industrialization, and emergence of modern forms of subjectivity) which radically transformed the nature of the art object itself. Readings emphasize the work of contemporary theorists and critics: Rainer Maria Rilke and Georg Simmel. Movements include: art nouveau, Viennese art and design, German Expressionism, Fauvism, Cubism. Artists: Auguste Rodin, Gustav Klimt, Adolf Loos, Vasily Kandinsky, Henri Matisse, and Pablo Picasso. Sections mandatory. GER:3a (DR:7)

4 units, Aut (Dickerman)

146/346. Rebellion, Revolution, and Reaction: European Art between the Wars—(Enroll in Feminist Studies HOT.)

3 units, Aut (Latimer)

147/347. The Bauhaus—The Bauhaus was an artistic idea, a school, and a social project. Its original curriculum was conceived by architect Walter Gropius in Weimar, Germany, at a time when architecture, painting, sculpture, and the applied arts were theorized and practiced under a common aesthetic and social agenda. Throughout its brief, intense life (1919-1933), the Bauhaus promoted a variety of artistic experiences that explored in different media the relationship between form and technique. Avant-garde and institutional, the Bauhaus constructed a unique visual culture of modernity grounded in experiment and rationality. The pedagogic principles, artistic theory, and practical activity of the school’s individual laboratories (architecture, design, photography, graphics, tapestry). (MOD-EU)

4 units (Berdini) not given 2000-01

148/348. Art under Hitler and Stalin—The role of the visual arts (architecture, exhibition design, painting, sculpture, photography) in Nazi Germany and Stalinist Russia. The relationship between art and totalitarianism, the uses of new systems of mass media, the similarities and distinctions between the two regimes, and the possibilities for critical resistance in the visual arts. (MOD-EU)

4 units (Dickerman) not given 2000-01

MODERN AMERICA

150/350. American Architecture and Urbanism—The development of architecture and city planning in the U.S. since colonial times, concentrating on those characteristics and problems that are distinctively American. (MOD-AM)

4 units (Turner) not given 2000-01
150A/350A. American Vernacular Architecture—Introduction to a variety of N. American building traditions by people who are not academically trained as architects. Focus is on European, African, and Native American traditions that shaped the most familiar and widespread folk architectures, and on the urban landscapes of 19th- and 20th-century African Americans and European and Asian immigrants. Rural and urban house types, vernacular building systems, commercial architecture, the public landscape, the vernacular landscapes of work and religion, and the built environment as expressions of ethnic and racial identities, organizers of social life, and conscious works of art. (MOD-AM)
4 units, Win (Upton)

151/351. Transatlantic Modernism: Paris and New York in the Early 20th Century—Modernism in the American arts at home and abroad, emphasizing transatlantic expatriation, cultural politics, and creative alliances. Painters and sculptors are the focus. The literary figures who interacted with artists (Gertrude Stein, William Carlos Williams, and Langston Hughes). Topics and artists: the Armory Show, Marcel Duchamp, Francis Picabia, Futurism, Fernand Léger, Alfred Stieglitz, Charles Demuth, Georgia O'Keeffe, Gerald Murphy, the Harlem Renaissance, John Storr, and Florine Stettheimer. Discussion sections. (MOD-AM)
153/353. Regionalisms—Comparative study of four cultural regionalisms of the 1920s and '30s: New York City (especially Harlem), the South, the Midwest, and the West (particularly the Southwest). The meanings artists attached to place, the invention of rhetoric and sign systems that stood for geographic districts, and the cultural politics of regional rivalry. Topics: Harlem Renaissance; Southern Agrarians; Midwestern Triumphvrate (Thomas Benton, Grant Wood, and John Curry); the artist colonies of Taos and Santa Fe. The representations of California as "region" in "Pacific Arcadia," a spring exhibition at the Stanford Museum. (MOD-AM)
4 units (Corn) not given 2000-01

155/355. American Art since 1945—Introduces the major figures, movements, and concepts of American art (with examples from Europe) from WW II to the present. Topics: the ideology and aesthetics of high modernism, the relationship between art and popular culture, the "death of painting," the question of postmodernism. Artists: Pollock, Newman, Stella, Johns, Warhol, Andre, Rainer, Smithson, Hesse, Serra, Kruger, Sherman. (MOD-AM)
4 units (Lee) not given 2000-01

157/357. Abstract Expressionism—The painting and sculpture of the major Abstract Expressionist artists 1935-59 (Jackson Pollock, Willem de Kooning, Franz Kline, Mark Rothko, and Adolph Gottlieb); and artists reacting to Abstract Expressionism (Ad Reinhardt, Jasper Johns, and Robert Rauschenberg). Emphasis is on works of art, and the cultural and political context in which these works were made. (MOD-AM)
4 units (Nemerov) not given 2000-01

FILM STUDIES

160/360. Cinema and the City—The 20th-century's ideas of The City are closely tied to the modernist medium of film. Cinema and the city both offer utopian built environments of perceptual and experiential richness; both are products of the same industrial and social transformations. Changing understandings of urban space (including cyberspace) are seen in a range of films from European and American narrative traditions, industrial films, experimental cinema, documentaries, and musical sequences. Emphasis is on the crime film, science fiction, and the "city symphonies" of the '20s. Weekly screenings required. Recommended: 4 or its equivalent. (MOD-EU/AM) GER:3a (DR:7)
4 units, Spr (Bukatman)

162/362. Cyborgs and Synthetic Humans—The synthetic human has a long history in world mythology: fairy tales and children's stories; and in contemporary genres of horror and science fiction. Stories of artificial-ly created life, living statues, clockwork automata, alien body snatchers, robots, cyborgs, and electronic simulations direct our attention to assumed definitions of the human and the self. Synthetic human narratives in film, fiction, and comics. The meaning of labor, gender, sexuality, death, emotion, rationality, bodies, consumerism, cosmetic surgery, and reproductive technologies. (MOD-EU/AM)
4 units (Bukatman) not given 2000-01

163/363. Science Fiction Cinema—Science fiction film's sense of wonder depends upon the development and revelation of new ways of seeing. If cinema is a privileged site of technological representation, then science fiction, the genre most obsessively concerned with technology and its deployment, takes on new relevance. The American SF film's emphasis on the fundamental activity of human perception and its exploration of other worlds, new cities, and other modes of being. Science fiction as the Hollywood genre most directly concerned with the essence of cinema itself, and such new technological spaces as the cyberspaces of the information age. (MOD-AM)
4 units (Bukatman) not given 2000-01

167/367. The Hollywood Musical—The liberation that arises in the film musical, a liberation that is reality and illusion and which can be physical, emotional, aesthetic, and social, all at once. Performance is central to the genre. Musicals connect cinema to other arts. The interplay among song, stage, and screen; and the interplay of cultural identities (regional, racial, gender, and sexual). Musicals provide a place for the staging of issues of identity: sexuality and ethnicity are emphasized onscreen and off. The impact of African-American and Jewish culture on the genre; issues of gay reception and interpretation. The history of the American stage musical. (MOD-AM)
4 units (Bukatman) not given 2000-01

168/368. Subjectivity and Gender in Contemporary European Film—Cinematic reflexivity, gendering film authorship, self-imaging masculine as feminine, modernism/postmodernism, narrative/anti-narrative, sexuality and difference, and allegories of spectatorship and voyeurism are centered on the works of Godard, Beineix, Besson, Bertolucci, Pasolini, Paspandi, Wenders, and others. (MOD-EU)
4 units (Lewis) not given 2000-01

CONTEMPORARY EUROPE AND AMERICA

170/370. Art since the Sixties—Movements in art since the 1960s, especially in performance, and their relations to and implications for other practices, within art and beyond. (MOD-EU/AM)
4 units, Win (Ward)

170B/30B. Art since the Sixties—Movements in art since the 1960s, especially in performance, and their relations to and implications for other practices, within art and beyond. (MOD-EU/AM)
4 units, Spr (Ward)
technology, industrialization, mass culture, communication, and social engineering and control from the invention of photography to recent visual practices. Emphasis is placed less on "machine aesthetics" than the issue of technological rationality, e.g., the art of the last 30 years (kinetic art, video, digital photography, etc.). Recommended: some familiarity with modern art. (MOD-EU)

174/374. Object after Minimalism—Object-based art from the 1960s to the present. Minimalism, process art, earth and land art, installation and site-specific work, body art, work that comments upon the museum and gallery, new media sculpture and environments (e.g., video, digital technologies). (MOD-AM)

4 units (Lee) not given 2000-01

176/376. The Feminist Legacy in Contemporary Art—The impact of Second Wave feminism on art making and art historical practice in the 1970s, and its reiteration and transformation in contemporary feminist work. Topics: sexism and art history, feminist studio programs in the '70s, essentialism and self-representation, themes of domesticity, the body in feminist art making, Bad Girls, the exclusion of women of color and lesbians from the art historical mainstream, notions of "performativity." (MOD-AM)

4 units (Lee) not given 2000-01

180/380. Chinese Art and Culture—Topics in Chinese art from the Neolithic to the 20th century. Emphasis is on recent archaeological discoveries, newly published material, and current issues of understanding and interpretation. (CL-AS)

4 units (Vinograd) not given 2000-01

185/385. Chinese Art in the Modern Era—Topics in Chinese visual 18th century to the present, with an emphasis on the 19th and 20th centuries. Issues of identity, community, and nationality; urban centers of production and consumption; art and politics; international arts, modernity and modernisms, transnational arts and new media. (MOD-AS)

4 units (Vinograd) not given 2000-01

186/386. Theme and Style in Japanese Art—Selected monuments of traditional Japanese architecture, sculpture, garden design, painting, and pots are presented in a chronological framework representing the intersection of art and society from protohistoric times through the early 19th-century. (CL-AS) GER:3a (DR:7)

4 units, Aut (Takeuchi)

187/387. Arts of War and Peace: Late Medieval and Early Modern Japan, 1500-1688—Narratives of conflict, pacification, orthodoxy, nostalgia, and novelty are viewed through the visual culture during the change of episteme from medieval to premodern, i.e., the 16th through early 19th centuries. The rhetorical messages of castles, teahouses, gardens, ceramics, paintings, and prints; the influence of Dutch and Chinese visuality; transformation in the roles of art and artist; tensions between the old and the new leading to the modernization of Japan. (EM-AS) GER:3a (DR:7)

4 units, Spr (Takeuchi)

188/388. Painting in Late Medieval and Early Modern Japan, 1500-1688—Questions of subject and subjectivity, the role of tradition/ideology vs. innovation/resistance, responses to the Other, developing art discourse, and transformation in notions of artist, art-making, and viewer response at different levels of Japanese society. (MED/EM-AS)

4 units (Takeuchi) not given 2000-01

200. Undergraduate Colloquium: Greek Vases in the Stanford Museum—Prerequisite: 100A or equivalent.

4 units, Aut (Maxmin)

201. Colloquium: Aspects of Later Greek Art—(Same as Classics 202C.)

4 units (Maxmin) not given 2000-01

202. Colloquium: Power of Image as Icon—Late Roman and Byzantine Art and Architecture—The formation of a new visual discourse from Constantine (4th century) to the Turkish conquest of Constantinople (1452). Artistic traditions (mosaics, icons, manuscript illumination) and building types centered on patterns of reception, ideology, and patronage in Rome, Ravenna, Istanbul, Mt. Sinai, the Balkans, and Sicily.

4 units (Lewis) not given 2000-01

205. Seminar: Medieval Narrative—Visual and intertextual strategies and structures in some major medieval narrative cycles in mural and manuscript illustration, within the context of current critical theory.

4 units (Lewis) not given 2000-01

207. Colloquium: Multiculturalism and Image Appropriation—Early Medieval Art and Architecture—Western Europe from c. 700 to 1095 centered on the Celtic, Anglo-Saxon, Carolingian, Ottonian, and Spanish Mozarabic phases of hybrid cultural formation and the creation of such works as the Book of Kells, the Sutton Hoo treasure, and the plan of St. Gall. In a period of social upheaval and political fragmentation, new modes of visual discourse emerged, and remnants of the late classical tradition survived within larger ideological patterns of assimilation and change.

4 unit (Lewis) not given 2000-01

210. Seminar: The Pastoral Vision in the Renaissance—Whether secular or profane, nostalgic or premonitory, the encounter with the other offered by the voluntary retreat into the countryside fostered an artistic genre that only could be accomplished by the combined representational naturalism and classical revival of letters pursued during the Renais-
sance. A multimedial discursive field, the pastoral offered a hermeneutic experience that exposed (and continues to expose) the social, gender, and ideological prerogatives of readers and beholders. The cultural and phenomenological implications of images like Giorgione's Tempest. Critical and art-historical models of interpretation are tested from iconology to semiotics.

4 units (Berdini) not given 2000-01

211. Seminar: Humanistic Discourse on Art—The linguistic and literary modes devised by the humanists of the 15th century to account for visual experience. How the humanist form of attention, constructed on an important, limited ensemble of classical disciplines (grammar, rhetoric, poetry, history, and moral philosophy) provided a bridge between the visual and the verbal, establishing the first coherent discourse on art. Readings/discussion survey the range and main themes of humanistic theory and art criticism (mimesis, perspective, composition, emphasis, color structure, etc.) elucidating the emergence of two distinctive modes which condition subsequent discourse on art: the narrative and the descriptive. Texts by Cennini, Alberti, Guarino, Facino, Fazio,
and Leonardo, and the contemporary reception of Pliny the Elder, Plutarch, Cicero, Quintilian, and Horace.
4 units (Berdini) not given 2000-01

212. Seminar: Michelangelo and the Aesthetics of the Unfinished—Michelangelo's sculptures were often left in a state prior to completion, so as to reveal the process and the results of their making. It was left to the beholders to complete these works in their imagination, and in this regard the artist's sonnets, letters, and Neoplatonic conceptions offered critical instruction. For the reader-beholder, Michelangelo's poetry, sculpture, and related drawings constitute a complex aesthetic unity. Readings from Michelangelo's sonnets and letters, art theory, and Platonicism and Neoplatonic works.
4 units (Berdini, Harrison) not given 2000-01

213. Undergraduate Major Seminar: Renaissance Rome—Art and Ideology in the Age of Julius II (1503-13)—The role played by Bernarst’s, Michelangelo’s, and Raphael’s art in shaping Julian Rome. The papal attempt to revise the dual foundation of Rome, i.e., classical antiquity and Early Christianity. Architecture, painting, and sculpture contributed toward construction of a new visual culture for a New Rome, a city destined to be the center of Christianity and the capital of an absolutist state. Antiquarian studies, monarchical ideologies, humanistic discourses, and the new artistic practices were experimented with throughout Italy in the previous century, and shaped a pontifical project which succeeded artistically but failed ideologically, as the subsequent divisions within Christendom demonstrated.
4 units (Berdini) not given 2000-01

215. Seminar: Modified Expectations—Caravaggio and the Beholder—Contrary to academic theory, in which an image should present the beholder with an experience of higher moral value, Caravaggio's paintings, religious or profane, offer no edifying exempla. They modified the beholder with an experience of higher moral value, Caravaggio's paintings, religious or profane, offer no edifying exempla. They modified the beholder’s expectations, and were perceived as a betrayal of artistic ethics. To the classicist Poussin, Caravaggio had destroyed painting. Yet, in the process of defying the ideals of painting, Caravaggio's work discloses dimensions of beholding, and of the beholder. Interpretive strategies from reception theory to psychoanalysis. The historical and theoretical circumstances of beholding Caravaggio's images.
4 units (Berdini) not given 2000-01

221. Undergraduate Seminar: Eugène Delacroix—Born in 1798, scorned by the art establishment in his early years, heralded by the critical "avant garde" (Baudelaire) in mid-life, Delacroix died in 1863 as one of the "old masters" of the French tradition, important to young painters (Manet and Degas) as a role model for their own work. Delacroix painted in every format (small easel pictures, large-scale architectural ensembles, lithographic works, drawings and illustrated notebooks), and left a body of critical writings in the form of letters and journals. Delacroix's life and art are the means for understanding the historical person and the culture of 19th-century France. Student group reports on general topics and individual presentations on specific works by Delacroix. Enrollment limited to 16. Prerequisite: consent of instructor. Recommended: reading knowledge of French.
4 units (Marrinan) not given 2000-01

223. Seminar: Aspects of Realism in 19th-Century Painting
4 units (Marrinan) not given 2000-01

225. Seminar: Paul Cézanne
4 units (Marrinan) not given 2000-01

230. Seminar: Interpretation and History—The Art of Benjamin West—Study of Benjamin West (1738-1820), the American artist who spent most of his career in England as court painter to George III. The "new historical" emphasis on the "West" in terms of the various discourses (British colonial expansion) embodied in his art. Close readings of individual works by West and his contemporaries.
4 units (Nemerov) not given 2000-01

4 units (W. Corn) not given 2000-01

233. Seminar: The Art of the Old West—Major painters and sculptors of the American West 1880-1920, including Frederic Remington, Charles Russell, and Charles Schreyvogel. Cowboys and Indians in the context of evolutionary theory, ethnographic documentation, national symbolism, immigration and the urban world, the advent of movies, other turn-of-the-century nostalgias (e.g., New England and the Middle Ages), and questions about the recoverability of the past.
4 units (Nemerov) not given 2000-01

241. Seminar: Collage/Montage—Case studies in collage and montage practice (including Cubist collage, the films of Dziga Vertov and Sergei Eisenstein, the photomontages of Hannah Höch and John Heartfield, and the early work of Robert Rauschenberg) and the historiographical problems that this work engenders. Important 20th-century theories of fragmentation and recombination including Walter Benjamin's conception of allegory; Claude Levi-Strauss on bricolage and Jacques Derrida's reworking of this term; and Frederic Jameson and Rosalind Krauss on pastiche.
4 units (Dickerman) not given 2000-01

251. Seminar: Frank Lloyd Wright—Examination of this most influential American architect, whose work transformed domestic architecture in particular. Students choose research subjects dealing with specific designs or aspects of Wright's career. Field trips to Wright's buildings in the Bay Area. Prerequisites: 141, 142, or 150.
4 units, Spr (Turner)

253. Seminar: Le Corbusier—A study of this controversial figure in modern architecture and city planning, whose designs and writings shaped much of the contemporary environment throughout the world. Students conduct research on selected aspects of Le Corbusier's work, theory, influence, or connection with related subjects. Prerequisite: 141 or 142.
4 units (Turner) not given 2000-01

254. Seminar: Utopia and Reality in Modern Urban Planning—Primarily for Urban Studies majors, but others may be admitted. Utopian urbanist thinkers (Ebenazer Howard, Le Corbusier, Frank Lloyd Wright, etc.) who established the conceptual groundwork of contemporary urban planning practice. Student participation and research-oriented term paper required.
4 units (Stout, Turner)

255. Seminar: The American College Campus—The college and university campus is a distinctively American type of environmental planning. The historical development of the campus, its spaces and architecture. Focus is on issues relating to Stanford and other Bay Area campuses. Prerequisites: 141, 142 or 150.
4 units (Turner) not given 2000-01

256. Seminar: The Everyday Landscape—The Ordinary, the Vernacular, and the Extraordinary—The common places we visit every day, and the things we do there, asking about ways that the banal landscape is made extraordinary through the construction of odd or striking buildings or landscapes (e.g., roadside structures or "outsider" art), the attribution of religious significance to otherwise unexceptional spaces, or the commemoration of catastrophic or exceptional events in ordinary spaces. Studies of the folk and the vernacular, current works on the "everyday" by Lefebvre, deCerteau, Bourdieu, and others, and psychological and philosophical works on perception, cognition, and concepts of the self.
4 units, Spr (Upton)
257. Undergraduate Seminar: Jackson Pollock—The works of the most famous of all 20th-century American modernists, his career from the early 1930s to his death in 1956. Emphasis is on the students' abilities to think, speak, and write cogently about paintings that seem to defy discourse.

4 units, Win (Nemerov)

258. Undergraduate Seminar: War and Representation—Focus is on the battle scene in visual culture, emphasizing the period from 1770 to the present. The art of Benjamin West and John Trumbull, the Civil War photography of Alexander Gardner, and 20th-century treatments of battle, including the propaganda films of the 1940s, the epic films of the 1960s (“The Guns of Navarone”) and the uses of representation in the Gulf War.

4 units, Win (Nemerov)

259. Seminar: The Art Museum—History and Practices—Workshop on contemporary museum culture, with emphasis on the collecting and exhibiting practices of art museums. Selected readings, field trips, and discussions with museum professionals. Each student creates a detailed proposal for a museum exhibition and presents it to a panel of faculty and curators.

4 units (Corn) not given 2000-01

261. Seminar: Theories of the Moving Image—Cinema and Models of Perception—A continuing tradition in film theory has emphasized cinema in relation to human perception. What are the implications of a visual medium that is so similar to, but equally distinct from, the operations of the eye? The question becomes fully relevant in an increasingly technologized and mediated world. Theorists: Benjamin, Kracauer, Epstein, Vertov, Eisenstein, Bazin, Münsterberg, Deren, Braukhage, Baudry, Mulvey and Deleuze. Weekly screenings required. Recommended: 4.

4 units (Bukatman) not given 2000-01

263. Undergraduate Seminar: Film Theory and Formal Analysis

4 units, Spr (Bukatman)

265. Seminar: French New Wave Film (1958-68)—Theory and Practice—Exploration of a radical paradigmatic shift in cinematic modernism in the works of Godard, Resnais, Truffaut, Varda, etc. New visual narratives of existentialist freedom, eroticism, and reflexivity.

4 units (Lewis) not given 2000-01

267. Seminar: Beyond the New Wave—French Film in 1970s, ’80s, and ’90s—Postmodernism, narrative/anti-narrative, spectatorship and voyeurism, auterism and cinematic reflexivity. America as problematic intertext, inter and sexual politics, crises in gendered identity, and the “New History.” The later works of Godard, Chabrol, Renais, Tanner, Truffaut, and Varda, and younger filmmakers, such as Beineix and Kieslowski.

4 units (Lewis) not given 2000-01

271. Seminar: Site Specific and Installation Art—Drawing on precedents in early 20th-century art (De Stijl, the Bauhaus, the Russian and Soviet Avant-Garde, Schwitters), considers the thematic of place in the production and reception of site-specific work, art made for, and bound to, a particular place. Topics: the legacy of the Gesamtkunstwerk, the notion of community and the public sphere, the viewer of art as phenomenological body, the body as site, the politics of liminal space, and the critique of the museum and gallery as institutions. Artists: Smithson, Heizer, Morris, Serra, Situationist International, Antin, Piper, Asher, Buren, Matta-Clark, Broodthaers, Haacke, Wilke, Gonzalez-Torres, Holzer, Green, Wodiczko, the Border Arts Collective, Wilson, Luna, Mendieta.

4 units (Lee) not given 2000-01

280. Seminar: Mapping Urban Visual Culture in 17th-Century Nanjing—Early urban visual modernity in China is considered through a discussion of aristocratic, religious, literati, commercial, and leisure culture spaces in 17th-century Nanjing. Problems in mapping physical, social, and cultural spaces of production and consumption; discourses of taste and value; and networks of relationship.

4 units, Aut (Vinograd)


4 units (Vinograd) not given 2000-01

283. Seminar: Court and City—Pictorial Art in Qianlong Period China—Painting and printmaking in later 18th-century China, focusing on the Qianlong era (1736-95). Topics: court partonage and collecting, political and ideological functions of art-making, and the contemporary urban visual cultures of the Yangzhou-Hangzhou region in the southeast.

4 units, Spr (Vinograd)

285. Seminar: Japanese Discourse on Painting and Its Chinese Antecedents—Primarily for graduate students in Asian art and Asian languages. The “information explosion” of the 17th century, brought about by advanced technologies of printing, made accessible to the Japanese the vast body of Chinese literature on painting theory. The major texts and their influence in Japan. Material is in English; some texts are read in the original to understand key aesthetic terms.

4 units, Spr (Takeuchi)

286. Seminar: Conformity and Rebellion in 18th-Century Japanese Painting—The rise of new styles and artistic revivals, the extraordinary number of “eccentric” painters, influences from China and the West, the proliferation of art-historical treatises, and the redefinition of the role of the artist in Japanese society. Prerequisites: 2, 186, 187, 188.

4 units (Takeuchi) not given 2000-01

287. Colloquium: “Pictures of the Floating World”—Images from Japanese Popular Culture—Examines printed objects produced during the Edo period (1600-1868), including the famous Ukiyo-e (“pictures of the floating world”) and lesser-studied genres like printed books (ehon), and popular broadsheets (kawaraban). How a society constructs itself through images; questions concerning the borders of the acceptable/censorship; theatricality, spectacle, and slippage; the construction of play, set in conflict against the dominant neo-Confucian ideology of fixed social roles. Prerequisites: 2, 186, 187, 188.

4 units, Aut (Takeuchi)

288. Seminar: Warrior Culture of Japan—The ethos and cultural legacy of the Japanese warrior: how those in power stay in power; the “tools of the trade;” how the image of the warrior was constructed in literature and in the visual arts; and the relationship between visual ideology and codes of legitimacy.

4 units (Takeuchi) not given 2000-01

288A. Seminar: Nostalgia in Japanese Art—Revivals, Reformations, Representations—The foundations of classical court culture in Japan as a sphere discourse, and its various afterlives: major themes, interpretations, text-image relationships, and the ideological uses to which the classical past was put throughout traditional Japanese culture.

4 units (Takeuchi) not given 2000-01

289. Colloquium: Arts of Zen Buddhism—Primarily for seniors. Since its introduction to Japan in the medieval period, Zen and its attendant arts have produced reams of discourse, despite the well-publicized Zen distrust of the intellect. The arts produced in the Zen milieu in the context of this literature, and the myths perpetrated about Zen art in the modern era. Prerequisite: familiarity with Japanese art and culture.

4 units (Takeuchi) not given 2000-01
297. Undergraduate Major Seminar: Methods of Art Historical Research—The historiography and methodology of the discipline of art history.
4 units (Lee) not given 2000-01

298. Independent Study: Art History—Reserved for approved independent research with individual faculty members. Letter grades only. any quarter (Staff)

299. Honors Thesis Research in Art History any quarter (Staff)

GRADUATE SEMINARS

HISTORICAL STUDIES

400. Greek Vase Painting 4 units (Maxmin) not given 2000-01

401. Political Iconography—Study of 6th-century painters and the extent to which their work can be seen to reflect the history and political shenanigans of their age. Prerequisite: 100A or 102.
4 units (Maxmin) not given 2000-01

420. Crossroads of the Enlightenment—The Artistic Culture of Rome in the mid-18th Century—Rome, as a long-privileged site for training young artists, acquired new importance following the discovery of ruins at Herculaneum and Pompeii (1730-1780). Roman artistic culture, as the arena where international artists and critics, dealers, and dilettantes met and were visited by wealthy young people making the Grand Tour, became the center of the contemporary art in Europe. Students research topics and presentations on any relevant aspect of artistic life in Rome at this time: patronage and patterns of collecting, monographs on artists or writers working in the city, art practices characteristic to Rome (e.g., copying antiquities), or constructions of the "mythic" Rome in visual renderings or written accounts. Prerequisite: working knowledge of at least one non-English language.
4 units (Marrinan) not given 2000-01

434. The Visual and Literary Art of Edwardian England—Interdisciplinary study focusing on England 1895-1918. The works of major painters (John Singer Sargent); writings of Thomas Hardy, Henry James, Arthur Conan Doyle, Kenneth Grahame, and Beatrix Potter; the relation to contemporaneous American art and literature; and the English visual art and poetry of WW I and later 20th-century constructions of the Edwardian period.
4 units (Nemerov) not given 2000-01

435. Women and the Arts 1860-1930: Issues of Class and Gender—Qualified upperclass undergraduates may enroll with consent of the instructor. Research seminar examining the advent of the professional woman artist, patron, and collector and all-female art clubs and educational institutions. Cultural comparisons are encouraged: high society with women in bohemia; women in Europe with those in the Americas; mature women with those of younger generations.
4 units, Spr (Corn)

4 units (Nemerov) not given 2000-01

438. The Visual and Literary Culture of San Francisco, 1890-1915—The major artists and writers in San Francisco around the turn of the century, including Douglas Tilden, Arthur Putnam, Jack London, and Frank Norris. Publications such as The Wave and Sunset, and larger cultural phenomena such as the City Beautiful movement. An analysis of the Panama-Pacific Exposition of 1915.
4 units, Aut (Nemerov)

439. Darkness and Light—American Illustration, 1895-1915—The turn of the century, the so-called "golden age" of American illustration, produced three well-known American artists, Maxfield Parrish, Howard Pyle, and N. C. Wyeth, and many talented, now largely forgotten artists whose images fill the pages of Scribner's, Century, and other illustrated periodicals and books. Yet early 20th-century illustration is still regarded as a "low" art form not worth serious visual analysis and critical study. American illustration in historical and theoretical frameworks, emphasizing the oddness (if not the outright darkness) of this ostensibly good-natured art.
4 units (Nemerov) not given 2000-01

4 units (Dickerman) not given 2000-01

442. Russian Avant-Garde—The work of key avant-garde figures in the wake of the Bolshevik Revolution (Kazimir Malevich, Vladimir Tatlin, El Lissitzky, Liubov Popova, Varvara Stepanova, Alekandr Rodchenko, and Gustav Kluitis) as shifting responses to the question of "How is one to be an artist in the new society?" Focus is on the relation of avant-garde work to the simultaneous phenomena of revolution and the rise of a new media culture. Issues of new media, the relationship between public and private, the body and technology, the development of the model of socialist realism and avant-garde collaboration with the Stalinist regime. Commentary on this period by Soviet works from the 1980s to the present.
4 units, Aut (Dickerman)

450. World Fairs and Theme Parks—World Fairs and theme parks as communications media and social discourse. From the 1851 Crystal Palace Exhibition in London, to expositions in Paris, Philadelphia, Chicago, New York, etc., fairs have been a fascinating and conflicted site of meaning. Technological and ideological utopianism were supported by nationalist discourse, capitalist enterprise, anthropological exhibition, and varied modes of popular address. The issues that recur across the history of the fairs: display culture; utopian space; sensory immersion; technological trauma; the place of nature, art, and design; urban planning; and virtual realities. The importance of fairs in understanding the contradictory foundations of American self-definition (e.g., moral uplift vs. popular entertainment). Amusement parks, contemporary themed entertainment sites, and the 1996 Internet World’s Fair.
4 units (Bukatman) not given 2000-01

452. 1944—A year of cultural production in painting, film, and literature. Jackson Pollock's "Gothic" and Vincente Minelli's "Meet Me in St. Louis," Mark Rothko's Slow Swirl by the Edge of the Sea and Val Lewton's Curse of the Cat People. Their production in 1944 over- or undergirded the momentous events of that year. The possibilities, or impossibilities, of relating disparate but coeval cultural products to one another. The possibilities, or impossibilities, of relating these cultural products to "context." The mechanics, or organisms, of the historical method, as well as the year 1944.
4 units, Spr (Nemerov)

455. Gender, Modernism, and Art History—Revisionist scholarship of gender and sexuality in Impressionism, Dada and Surrealism, abstraction, and pop art. Students elect their own topics for research and interpretation.
4 units (Corn) not given 2000-01
460. Experimental Cinemas— Against the background of film’s novelty in the early 20th century and the ponderous movements towards an “art” derivative of literature and theater, the avant-garde has located cinematic art in spatio-temporal experiment. Beginning with Futurism, the avant-gardes of Europe, the U.S.S.R., and the U.S. celebrated and produced films that opposed narrative cinematic conventions. Through a reflexive engagement with the medium’s metamorphic fluidity, film could produce abstraction, political argument, an entry into the rhetoric of the unconscious and the realm of cognition, refusals of meaning, and explorations of perception. Films from the ‘20s through the ‘70s through historical context and formal operations.

4 units. Win (Bukatman)

474. Conceptual Art— Issues surrounding conceptual art from the ‘60s to the mid-’70s. Topics: the end of the work of art and the notion of “art as idea” or philosophical proposition; the relationship between art, language, and the document; ephemeralty and “dematerialization;” body art performativity and the public sphere. Artists: Sol Lewitt, Joseph Kosuth, Hans Haacke, Adrian Piper, Vito Acconci. Art and language: Joan Jonas, Chris Burden, Dan Graham, Bruce Nauman, Lawrence Weiner, Hannah Darboven, Danien Buren.

4 units (Lee) not given 2000-01

474A. Innocent Bystanders: Performance, Audience, Ethics— What does it mean to agree to watch an artist be shot? Seminar examines a series of violent or otherwise provocative performance by artists including Abramovic, Acconci, Burden, Ono and Smith, in terms of an inquiry into the demands they place on audiences and publics.

4 units. Win (Ward)

486. Methods and Historiography in Japanese Art— Introduces graduate students in Asian art and other disciplines to issues of historiography, research techniques, dictionaries for deciphering script styles, and other tools for advanced work in Japanese art.

4 units (Takeuchi) not given 2000-01

487. Chinese and Japanese Painting Discourse— The relationship between the large body of Chinese painting treatises and their rearticulated roles in Japan: subjectivity and ideology, realism/idealism; legitimacy; visuality; social formations. Prerequisite: knowledge of Chinese or Japanese.

4 units (Takeuchi) not given 2000-01

488. Problematizing the Japanese Landscape of Travel— The cultural construction of landscape in medieval and premodern Japan. The representation of landscapes, seen and imagined, in painting, literature, religion, and social practice. Topics: religious visions and ritual fields (mandalas, sacred mountains), sites of cult and cult of sight (Fuji, Kumano), narratives of itinerary (travel diaries, illustrated hand scrolls), and topographic taxonomies (Meisho, Shinkeizu, guidebooks).

4 units (Takeuchi) not given 2000-01

CRITICAL STUDIES

500. Methods and Historiography of Art History— Close analysis of key historical and methodological texts, providing a graduate-level introduction to the writing, history, and interpretative approaches of the discipline of art history. Authors: Berenson, Mirelli, Wolfflin, Riegl, Panofsky, Fry, Greenberg, Schapiro, Clark, Krauss, Bois.

4 units (Dickerman) not given 2000-01

501. The Vision of Art History

4 units (Marrinan) not given 2000-01

502. Visual Theory— Introduction to some major theoretical approaches in the contemporary praxis of art history and film studies. Readings/discussion are centered on the problematics of poststructuralism, semiotics, narratology, phenomenology, reception theory, issues of gender, context, and the new Marxism.

4 units (Lewis) not given 2000-01

503. Notions of “The Public” in Art Historical Discourse

4 units (Marrinan) not given 2000-01

504. Photography and Visuality— Using various case studies in 19th- and 20th-century photographic practice, explores the intersection of issues of social context, technology, and vision in the definition of historical modes of perception. Weekly meetings at San Francisco Museum of Modern Art or other collections.

4 units (Dickerman) not given 2000-01

505. Phenomenology of Film— Film and phenomenology are 20th-century developments historically and conceptually interdependent. Phenomenology investigates consciously experienced phenomena, apart from causality or presupposition. Embodied subjectivity is central to the intensely experiential medium of cinema. The ways that film foregrounds, distills, and recasts aspects of phenomenological process. The analysis of the embodiment of vision replaces the “decoding” of narrative or symbolic systems, and the easy link between cinematic illusion and ideological duplicity is replaced by an exploration of visual knowledge and subjective development. Writers and filmmakers shared the task of mapping a phenomenology of film. Authors: Bazin, Cavell, Michelson, Deleuze, Sobchack, Gunning. Filmmakers: Brakhage, Warhol, Snow, Kubrick, Gebr. Screenings emphasize experimental cinema, often an interrogation of these very issues. The historical movement away from, and the return to, phenomenology in film analysis.

4 units (Bukatman) not given 2000-01

510. Theories of the Sublime and Art— For graduate students and advanced art history majors only. The notion of the sublime through the terms of art and art history. Readings in philosophy and literary criticism (Kant, Burke, DeMan, Lacoue-Labarte, Lyotard, Nancy, Weiskel, etc.) and art historical “case studies” (European Romanticism, American landscape, modernist abstraction, earth work, and recent video).

4 units (Lee) not given 2000-01

512. The Time of the Object— How artists, art historians, philosophers, and critics have theorized the temporality of the art object. Topics: the origin of the work of art, duration, repetition, entropy, kineticism, the monument, the end of death of art, “schizophrenia.” Writers: Bergson, Deleuze, Foucillon, Fried, Hegel, Heidegger, Jameson, Kubler, Krauss, Riegl.

4 units (Lee) not given 2000-01

514. Psychoanalytic Perspectives on Art and Literature— Experiments with and critiques of psychoanalytic perspectives on a broad spectrum of visual images and literary texts. Book illustration, advertising, and the cartoon strip, and conventional media such as theater, novel, painting, and sculpture. Topics: symbolism, play, dreams, madness, the biography of the artist, fetishism, trauma. Texts: Freud, Lacan, Melanie Klein, and Winnicott.

4 units, Win (Spitz)

516. Narrative Theory and Visual Forms

4 units (Marrinan) not given 2000-01

518. Scopophilia— On Visual Pleasure— What kind of images give pleasure and why? The modalities of attention and expectation in the visual experience that resolve in what psychologists call scopophilia are analyzed within a historical horizon which moves from the neo-Platonic legitimation of aesthetic pleasure during the Renaissance (including its reconciliation with Christian faith) to the modernist emancipation of visual pleasure from mimetic representation. Readings focus on the structure and modifications of the language of appreciation as it relates to understanding, from the early theories of Leonardo, to the criticism of Diderot, modern connoisseurship, the psychoanalytic theories of Freud and Lacan, and contemporary forms of reception such as Derrida’s notion of the Gift.

4 units (Berdini) not given 2000-01
519. **Looking at Violence**—Violence in the media and its effect upon viewers, especially the young, is an issue of national concern that has produced legislation for the ratings of movies, television shows, and computer and video games. “V-chips” can be programmed to censor electronically what TV programs they play. These are political and legal fixes. Why do we watch violence in the first place? Why are images of violence compelling? Texts of aesthetics, psychology, and moral philosophy help develop detailed analysis for specific examples of visual media (painting and sculpture, film, and video). Preliminary ideas about a history of our desire to look at images of violence.

4 units (Marrinan) not given 2000-01

**RESEARCH**

600. **Art History Bibliography and Library Methods**—Primarily for art history graduate students; upper-class undergraduate majors who plan to continue in art history on the graduate level may enroll with the consent of the instructor. Introduction to reference works and library techniques essential to the study of architectural and art history. Sources of artistic, historical, and cultural information in their printed and automated forms.

3 unit, Aut (Ross)

601. **Graduate Proseminar: Graduate Studies in Art History**—For first-year art history graduate students only. Introduction to fields, issues, and practices in art history.

2 units, Aut (Nemerov)

610. **Teaching Praxis**

1-5 units, any quarter (Staff)

620. **Core Area Exam Preparation**—For art history Ph.D. candidates. Prerequisite: consent of instructor.

4 units, any quarter (Staff)

630. **Core Area Examination**

any quarter (Staff)

640. **Dissertation Proposal Preparation**

any quarter (Staff)

650. **Dissertation Research**

any quarter (Staff)

660. **Independent Study**—Reserved for approved independent research project with individual faculty members (for graduate students only).

any quarter (Staff)

**PRACTICE OF ART**

14. **Drawing for Nonmajors**

2 units, Aut, Win, Spr (Kilgallen, Dorosz)

15. **Printmaking for Nonmajors**

2 units, Aut (Colburn)

16. **Sculpture for Nonmajors**

2 units, Win (Fin)

17. **Photography for Nonmajors**

2 units, Spr (Mueller)

50. **Clay Modeling**—Entry level. The representational ideas and techniques of Rodin, Picasso, Medardo Rosso, Segal, and Duane Hanson, and the irrational approach of Jean Arp, Dubuffet, and Giacometti. Students work from the life model: library readings and slide lectures.

3 units, Aut, Win, Spr (Randell)

60. **Design I: Fundamental Visual Language**—Formal elements of visual expression (color, composition, space, and process) are experienced analytically and intuitively through hands-on projects. mediums vary and are two- and three-dimensional. Originality and inventiveness are emphasized within the constraints of each assignment. Content is realized abstractly. Centered in design, but relevant to all visual art study and meaningful to the general university student who seeking to develop visual perception.

3 units, Aut (Kahn)

70. **Photography I**—The critical, theoretical, and practical aspects of creative photography are addressed through basic camera and lab techniques. Lecture/discussion, viewing of slides, and field work. Stanford Museum and Art Gallery viewing are scheduled according to current exhibitions. 35mm camera required.

4 units, Aut, Win, Spr (Leivick, Staff)

117. **History and Philosophy of Design**—(Enroll in Mechanical Engineering 120.)

3-4 units, Spr (Katz)

130. **Inscription Technology**—The basics of sensors, processors, and actuators needed to create artworks that interact, record, and communicate. Emphasis is on the sculpture and interactive dimensions.

3 units, Aut, Spr (DeMarinis)

131. **Sound Art I**—Acoustic, digital and analog approaches to sound art. Familiarization with techniques of listening, recording, digital processing and production. Required listening and readings in the history and contemporary practice of sound art.

3 units, Aut (DeMarinis)

132. **Sound Art II**—Advanced sound production techniques, emphasizing presentation, including performance and interactive sound installation. Prerequisite: 130 or 131, or consent of the instructor.

3 units, Win (DeMarinis)

133. **Phenomena Art**—Focus is on the creation of works of art that have natural or unnatural phenomena at their root: the movements of light and water, the chaos of living and computing systems, and the response characteristics of the human sensory apparatus.

3 units, Win (DeMarinis)

140. **Drawing I**—Introduction to functional anatomy and perspective as these apply to problems of drawing the form in space. Individual and group instruction as student’s work from still life set-ups, nature, and the model. Emphasis is on the development of critical skills and perceptual drawing techniques for those with little or no previous experience with pastels, inks, charcoal, conte, and pencil. Lectures alternate with studio work in the investigation of drawing fundamentals.

3 units, Aut, Win, Spr (Staff)

141. **Drawing II**—Intermediate/advanced drawing. Observation, invention, and construction. Development of conceptual and material strategies, with attention to process and purpose. May be repeated for credit. Prerequisite: 40 or 140, or consent of instructor.

3 units, Aut, Win, Spr (Staff)

142. **Drawing III**—Advanced drawing. Emphasis is on student initiative with respect to composition, color, and use of a variety of drawing materials. Work from imagination, still life, and model. May be repeated for credit. Prerequisite: 40 or 140, or consent of instructor.

3 or more units, Aut, Win, Spr (Staff)

145. **Painting I**—Introduction to techniques, materials, and vocabulary in oil painting. Still-life, landscape, and figure are used as subject matter. Painting and drawing directly from life is emphasized.

3 units, Aut, Win, Spr (Staff)

146. **Painting II: The Self-Portrait in Painting**—Symbolic, narrative, and representational self-portraits. Introduction to the pictorial strategies, painting methods, and psychological imperatives of Durer, Rem-
brandt, Cezanne, Kahlo, Beckmann, Schiele, and Munch. Students paint from life, memory, reproductions, and objects of personal significance to create a world in which they describe themselves. Prerequisites: 140, 145, or consent of instructor.

3 units, Aut, Win, Spr (Staff)

147. Painting III—Advanced painting with emphasis on the individual point of view. May be repeated for credit. Prerequisites: three quarters of 145, 146, or equivalent, or consent of instructor.

3 or more units, Aut, Win, Spr (Staff)

148. Printmaking—Introduction to print-making using monotype, a graphic art medium used by such artists as Blake, Degas, Gauguin, Pendergast, etc. May be repeated for credit. Prerequisite: 40 or 140.

3 units, Win, Spr (Chagoya)

149. Collage—The generative principles of this most characteristic 20th-century art form. Along with assemblage (its three-dimensional equivalent) and montage (its counterpart in photography, film, and video), collage has introduced many of the crucial aesthetic issues of the modern and postmodern eras. Typically, collage creates an expressive visual language through juxtaposition and displacement, and through sheer materiality, difference, and event. Issues of location (where it happens), object (what it is), process (how it is realized), and purpose (why it is). Prerequisites: 140, 145, or consent of the instructor.

3 units, Win (Hannah)

152. Constructed Art—The non-objective inventions of the Russian Constructivists are the departure point which parallels the development of non-representational sculpture beginning in the early 20th century. Found Art, welded sculpture, Assemblage, and Kinetic Art projects direct the students’ attention to the continuing evolution of art ideas. Lectures, readings, and projects culminate in sculptures concerning art of the 1960s and ‘70s: Minimalism, Earth Works, and Process Art.

3 units, Aut (Randell)

153. Recent Sculpture Concepts and Projects—Study and practice of the art of recent decades, emphasizing current post-abstraction procedures. Various materials and nonmaterials. Prerequisite: any one of 50, 60, or 70.

3 units, Win, Spr (Randell)

160. Design II: The Bridge—The historical spectrum of design, from practical to ritual, while maintaining contact with the basic values and the conceptual orientation of visual fundamentals. Two- and three-dimensional projects are sequentially grouped to relate design theory to application, balancing imaginative and responsible thinking. Prerequisite: 60.

3 or more units, Win (Kahn)

168A. Introduction to Urban Design—(Enroll in Urban Studies 170.)

5 units, Win (Gast)

169. Professional Design Exploration—Six to eight mature projects are stimulated by weekly field trips into significant areas of design activity or need.

3 or more units, Spr (Kahn)

170. Photography II—Students individually pursue a topic of their own definition. Class sessions meet for individual and group critiques, lab demonstration, discussions, and slide lectures.

3 units, Win, Spr (Staff)

172. Alternative Processes—Priority to advanced students. Technical procedures and the uses of primitive and hand-made photographic emulsions. Enrollment limited to 10. Prerequisites: 70, 170, 270, or consent of instructor.

3 units, Aut (Leivick)

173. Digital Narratives—Focus is on developing visual narrative skills based on digital production and distribution media. Topics: digital imagemaking, storyboarding, dramatic structure, image manipulation, image sequencing, manipulation of virtual time and space, quicktime movie production and interactive web authoring. Prerequisite: working knowledge of Macintosh and hypertext.

3 units, Aut (Niemeyer)

174. Digital Art in Public Spaces—The relationship between digital art, public policy, and community action. Large-scale works are produced for installation in Bay Area public spaces using digital art media. Final project is a collaborative effort between student artists, community administrators, and the public involving issues of public concern, communication strategies, fundraising, and interacting with the press. For pre-enrollment, see http://www-leland.stanford.edu/dept/SUDAC. Prerequisites: 60 or 145, 70; working knowledge of Photoshop and Illustrator.

3 units, Spr (Niemeyer)

175. Motion Studies: An Introduction to Animation, Cartoon Physics, and Funny Walks—Hands-on animation, providing a foundation for future work in computer graphics, digital art, and animation. The techniques, tools, principles, and methods of traditional animation. Through lectures, hands-on exercises, motion analysis, and screenings, students learn a variety of animation techniques and gain a background of timing, spacing, weight, and expressive motion.

3 units, Aut (Loeb)

175A. The Virtual Object—Introduction to modeling, shading, and lighting in Maya, a high-end 3D modeling and animation application. Prerequisite: 173 and/or 175.

3 units, Win (Niemeyer)

175B. Digital Narrative Production—Third in a year-long sequence to produce full screen, multiple character, short animation.

3 units, Spr (Niemeyer)

176. The Illusion of Life—The analysis of visual and temporal perceptions of reality provides the basis for advanced modeling, shading, and lighting exercises for virtual 3D environments. For pre-enrollment, see http://www-leland.stanford.edu/dept/SUDAC.

3 units, Win (Dym)

200. The Work of Art and the Creation of Mind—(Enroll in Education 200.)

4 units, Win (Hannah, Rehm, Ross, Sano)

246. Individual Work: Drawing and Painting—Prerequisites: at least two quarters of painting or drawing and consent of instructor.

Aut, Win, Spr (Staff)

248. Advanced Monotype—Continuation of monotype, dealing with advanced technical and aesthetic problems in the medium. Prerequisite: 148.

3 or more units (Chagoya)

249. Advanced Undergraduate Seminar—Interdisciplinary concepts, engaging in collaborative projects using a variety of materials and techniques. This capstone experience for the major and minor in Art involves an exhibition open to the public or a final project review to which visiting critics may be invited. Taught by visiting artists.

3 units, Win, Spr (Staff)

250. Individual Work: Sculpture

any quarter (Randell)

260. Individual Work: Design

any quarter (Kahn)
268. Design Synthesis—Mature semi-elective problems in composite and multi-media design areas. Prerequisites: any two design courses above 160.
4 or more units (Kahn) not given 2000-01

269. Advanced Creative Studies—Seminar based on elective design projects in areas of individual specialization. Prerequisite: consent of instructor.
3 or more units, Aut, Win (Kahn)

270. Photography III—Student continues with own work, showing it in weekly seminar critiques.
Aut, Win, Spr (Leivick, Staff)

271. The View Camera, Its Uses and Techniques—Designed for serious students of photography who wish to gain greater control and refine skills in image-making. 4 x 5 view cameras are provided. Enrollment limited to 8.
3 units, Aut, Win, Spr (Leivick, Staff)

272. Individual Work: Photography—Student continues with own work, showing it in weekly seminar critiques.
any quarter (Leivick, Staff)

273. Individual Work: Digital Media
any quarter (Niemeyer)

310A,B,C. Directed Reading: Studio
3 units, any quarter (Staff)

342. Master’s Project—Two weekly seminars and studio practice (individual tutorial). The Object Seminar is a forum in which student work is critiqued on issues of identity, presentation, and the development of coherent critical language. The Concept Seminar explores various modes of conceptualization to broaden the base of cognitive and generative processes. Readings, discussions, writing.
any quarter (Staff)

360A,B,C. Master’s Project (Seminar): Design
Aut, Win Spr (Kahn)

AFFILIATED DEPARTMENT OFFERINGS

See respective department listings for course descriptions and General Education Requirements (GER) information.

GERMAN

128. The Beauty of Evil: Art and Morality in German Modernism

167N. Stanford Introductory Seminar: German Film to 1945

181A. The Aesthetics of Perception

MECHANICAL ENGINEERING

101. Visual Thinking

SLAVIC LANGUAGES AND LITERATURES

154/254. History of Russian Theater

152/252. Russian Modernist Theater: Naturalism, Expressionism, Symbolism, and Futurism

133A/233A. Deviation from Dogmas: Film in East Europe from 1956 to 1968

OVERSEAS STUDIES

The following courses are approved for the Art and Art History majors and taught overseas at the campus indicated below. Students should discuss with their major advisers on campus which courses would best meet their educational needs. Course descriptions can be found in the "Overseas Section" section of this bulletin or in the Overseas Studies Program office, 126 Sweet Hall.

BERLIN

110Y. Architecture and the City, 1871-1990: Berlin as Nucleus of Modernity—(Same as Overseas Studies 143U.)
4 units, Spr (Neckenig)

141Y. The Industrial Revolution and its Impact on Art, Architecture, and Theory—(Same as Overseas Studies 117V.)
5 units, Aut (Neckenig)

FLORENCE

111Y. From Giotto to Michelangelo: Introduction to the Renaissance in Florence
4 units, Win (Verdon)

115Y. The Duomo and Palazzo della Signora: Symbols of a Civilization
4 units, Aut (Verdon)

OXFORD

152Y. Museums, History, and Culture
4 units, Aut (J. Corn, W. Corn)

PARIS

123Y. French Painting from 1780-1900
4-5 units, Win (Halevi)

PUEBLA

190Y. Popular Mexican Art
4 units, Win (Staff)

ASIAN LANGUAGES

Emeriti: (Professors) Albert E. Dien, David S. Nivison, Makoto Ueda;
(Associate Professors) William A. Lyell*, Susan Matisoff
Chair: Chao Fen Sun
Professor: John C. Y. Wang (on leave)
Associate Professors: Thomas W. Hare (Asian Languages, Comparative Literature), Yoshiko Matsumoto, Haun Saussy (Asian Languages, Comparative Literature; on leave), Chaofen Sun
Assistant Professors: Wan Liu, James Reichert, Deborah Tze-lian Sang
Senior Lecturers: Kazuko M. Busbin, Kimie N. Nebrig
Lecturers: Fumiko Arao, Shelly W. Chan, Marina Chung, Keiko Fukuma, Grace Li, Hisayo O. Lipton, Momoyo K. Lowdermilk, Aki Mori, Yu-hua Rozelle, Xiao Yu, Hong Zeng, Qi Zhu
Acting Assistant Professor: John Wallace
Visiting Assistant Professor: David Schaberg

Chinese-Japanese Language and Area Studies Faculty:
Professors: Masahiko Aoki (Economics), Peter Duus (History), Harold L. Kahn (History, emeritus), Lawrence Lau (Economics), John W. Lewis (Political Science, emeritus), Jeffrey Mass (History), Daniel I. Okimoto (Political Science), Jean Oi (Political Science), Thomas P. Rohlen (Education), Andrew Walder (Sociology), John C. Y. Wang (Asian Languages), Arthur P. Wolf (Anthropological Sciences), Lee H. Yearley (Religious Studies)
Associate Professors: Carl W. Bielefeldt (Religious Studies); Bernard Faure (Religious Studies), Thomas W. Hare (Asian Languages, Comparative Literature), William A. Lyell (Asian Languages), Yoshiko Matsumoto (Asian Languages), David Palumbo-Liu (Comparative Literature), Haun Saussy (Asian Languages, Comparative Literature), Peter Sells (Linguistics), Chaofen Sun (Asian Languages) Melinda Takeuchi (Art and Art History), Richard Vinograd (Art and Art History)

* Active in the U.S.
Assistant Professors: Wan Liu (Asian Languages), Ellen Neskar (History), James Reichert (Asian Languages)

Senior Lecturers (Asian Languages): Kazuko M. Busbin, Kimie N. Nebri

Lecturer: Hill Gates (Anthropological Sciences)

Recalled to active duty.

The Department of Asian Languages offers courses in the languages, linguistics, cultures, and literatures of China, Japan, and Korea. The department accepts candidates for the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy in Chinese or Japanese. It also offers an undergraduate and a Ph.D. minor in Chinese or Japanese language and literature.

For information concerning other opportunities for study in the Asian field, see listings under the following departments and programs: Anthropological Sciences, Art and Art History, Business, Comparative Literature, East Asian Studies, Economics, History, Interdisciplinary Studies in Humanities, Law, Linguistics, Philosophy, Political Science, Religious Studies, and Sociology. Students interested in Asian languages not listed should contact the Special Language Program, Language Center.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The A.B. degree is granted both in Chinese and in Japanese. The following courses and their prerequisites must be completed with a grade point average (GPA) of 'C' or better:

1. Concentrations in Chinese: Asian Languages 91 and 92, Chinese 207, Asian Languages 131, 132, 133, and four other content courses dealing with China primarily at the 100 level, as approved by the undergraduate adviser. Asian Languages 133 is the required Writing in the Major (WIM) course.

2. Concentrations in Japanese: Asian Languages 91 and 92, Japanese 103, and seven other content courses dealing primarily with Japan at the 100 level, as approved by the undergraduate adviser. At least two of these courses must be selected from the sequence 135, 136, 137, 138. Asian Languages 138 is the required WIM course. Asian Languages 51/151 and Japanese 30/130 are not counted toward the major.

These requirements are in addition to the University's basic requirement for the bachelor's degree. Letter grades are mandatory for all required courses.

MINORS

The undergraduate minor in Asian Languages has been designed to give students majoring in other departments an opportunity to gain a substantial introduction to Chinese (Mandarin) or Japanese language, as well as an introduction to the culture and civilization of East Asia. The minor consists of:

1. Completion of one year of language study at the second-year level (that is, Chinese 21, 22, 23 or Japanese 21, 22, 23) for students with no previous training in Chinese or Japanese. Students who already have first-year competence in Chinese or Japanese must complete the third-year course (Chinese 101, 102, 103 or Japanese 101, 102, 103) before undertaking any training in the Department of Asian Languages. Students who already have a competence at the second-year level may fulfill the language component of the minor by taking three courses in the department using materials in either Chinese or Japanese. These courses may be language courses such as the third-year sequence mentioned above, or they may be advanced literature and linguistics courses, depending on the capabilities and interests of the student in question.

2. The core courses, Asian Languages 91 (Traditional East Asian Civilization: China), and Asian Languages 92 (Traditional East Asian Civilization: Japan).

3. Two courses selected from among the department's other offerings in the literature, linguistics, and civilization of a given minor area. All courses for the minor must be completed with a GPA of 'C' or better.

HONORS PROGRAM

Majors with an overall GPA of 3.5 may apply for the honors program by submitting a senior thesis proposal to the honors committee during Winter or Spring Quarter of the junior year. The proposal must include a thesis outline, a list of all relevant courses the student has taken or plans to take, a skeleton reading list including a work or works in Chinese or Japanese, and the name of a faculty member who has agreed to act as honor's supervisor.

If the proposal is approved, research and writing begins in the Spring Quarter of the junior year, and for the first two quarters takes the form of directed reading with the chosen supervisor; the finished essay (normally about 15,000 words) is submitted to the committee no later than the end of the Winter Quarter in the senior year. From 10 to 15 units of credit are granted for the finished thesis.

COTERMINAL PROGRAMS

With department approval, students may be able to combine programs for the A.B. and A.M. degrees in Chinese or Japanese. For details, see the "Graduate Degrees" section of this bulletin.

EAST ASIAN STUDIES THEME HOUSE

EAST House, located at Governor's Corner on campus, is an undergraduate residence that houses 60 students and offers them a wide variety of opportunities to expand their knowledge, understanding, and appreciation of East Asia. Assignment is made through the regular undergraduate housing draw.

SUMMER PROGRAM

A nine-week summer program of intensive instruction is offered, on three different levels, in both Chinese and Japanese. The intensive courses provide the equivalent in instruction to regular academic-year courses. (See courses Chinese 5, 25, 105 and Japanese 5, 25, 105, and 114 as described below.) For detailed information about these and other aspects of the summer program, inquire at the Department of Asian Languages.

GRADUATE PROGRAMS

Admission—All students contemplating application for admission to graduate study must have a creditable undergraduate record. The applicant need not have majored in Chinese or Japanese as an undergraduate, but must have had the equivalent of at least three years of training in the language in which he or she intends to specialize, and must also demonstrate a command of English adequate for the pursuit of graduate study. Applicants should not wish merely to acquire or improve language skills, but to pursue study in one of the following fields: Chinese history (premodern), Chinese linguistics, Chinese literature, Chinese philosophy, Japanese cultural history, Japanese literature, and Japanese linguistics.

MASTER OF ARTS

The A.M. is granted in Chinese and in Japanese. The normal length of study for the degree is two years.

Applicants who wish to obtain only the A.M. and who do not intend to proceed to the Ph.D. are considered only if no financial aid is requested. Students who wish to spend the first year of graduate study at the Taipei or Yokohama centers must obtain department approval first. Candidates for the degree must be in residence at Stanford in California during the final quarter of registration.

A thesis or an annotated translation of a text of suitable literary or historical worth is required for the A.M. degree. Under special circumstances, a paper approved by the graduate adviser may be substituted.

The University's basic requirements for the master's degree, including a 36-unit minimum requirement, are given in the "Graduate Degrees" section of this bulletin. Department requirements are set forth below.

CHINESE

The candidate must:

1. Meet the department's requirements for the A.B. in Chinese or their equivalent.
2. Complete the following course work: 103, 201, 221, 222, 223, 299; four courses in Chinese numbered between 230 and 292; and two upper-division or graduate-level courses in fields such as Chinese anthropology, art, history, philosophy, and politics as approved by the graduate adviser in consultation with the student’s individual adviser. Students may be exempted from 101, 102, 103, and 221, 222, 223 by passing examinations to demonstrate that they have attained equivalent language competence. Letter grades are mandatory for all required courses and their prerequisites.

JAPANESE

The candidate must:

1. Meet the department’s requirements for the A.B. in Japanese or their equivalent.
2. Complete the following course work: 201, 211-213, 246, 247, 248, 299; four courses in Japanese numbered between 256 and 298; one course in literary theory or methodology at the 100 level or higher; and two courses in such fields as Japanese anthropology, art, history, politics, and religion, as approved by the graduate adviser in consultation with the student’s individual adviser. Students may be exempted from 211, 212, 213, and 246 by passing examinations to demonstrate that they have attained equivalent language competence. Letter grades are mandatory for all required courses and their prerequisites.

DOCTOR OF PHILOSOPHY

The Ph.D. degree is granted in Chinese and Japanese. Candidates for the degree are expected to acquire a thorough familiarity with Chinese or Japanese literature, an adequate command of both languages, and a comprehensive knowledge of East Asian history, social institutions, and thought. The University’s basic requirements for the Ph.D. are given in the “Graduate Degrees” section of this bulletin. Department requirements are set forth below.

ADMISSION TO CANDIDACY

Students admitted with an A.B. only are evaluated by the graduate faculty during the Autumn Quarter of their second year at Stanford. The evaluation is based on written work and at least a portion of the A.M. thesis or translation. If the faculty have serious doubts about a student’s ability to work for the Ph.D., they will convey this to the student. During the subsequent Spring Quarter, the faculty formally decides whether a student should be admitted to candidacy for the Ph.D. or be terminated. In the case of a student who already has an A.M. in Chinese or Japanese when admitted to the department, the evaluation takes place in the Spring Quarter of the student’s first year. If a student goes to the Taipei or Yokohama centers during his or her first two years, the department will consider an extension for admission to candidacy. The timing of the evaluation of a student admitted with an A.M. in East Asian Studies is decided on an individual basis.

Admission to candidacy does not mean that the student has fulfilled all requirements for the degree except the dissertation, but that the department faculty consider the student qualified to pursue a program of study leading to the Ph.D. and that, subject to continued satisfactory progress, the student’s status in this department is secure.

REQUIREMENTS

A candidate must fulfill the following requirements:

1. Demonstrate a reading knowledge of French, German, or another European language approved by the graduate adviser.
2. Complete two seminars at the 300 level. These seminars must be in different subjects.
3. Pass an examination in the supporting Asian language. A candidate whose field is Chinese is examined on his or her ability to read modern Chinese works relevant to his or her field of study. This requirement may be met by taking Chinese 101, 102, and 103 or 104 for letter grades. A candidate whose field is Japanese is examined on the ability to read classical Chinese works relevant to his or her field of study. This requirement may be met either by taking Chinese 205, 206, and 207 for letter grades.
4. Pass a set of four comprehensive written examinations, one of which tests the candidate’s methodological competence in a discipline. The remaining three fields are chosen, with the approval of the graduate adviser in consultation with the student’s individual adviser, from the following: anthropology, art, Chinese literature, history, Japanese literature, linguistics, philosophy, and religion.
5. Demonstrate pedagogical proficiency by serving as a teaching assistant for a minimum of one quarter, and taking Chinese, Japanese, or Korean 208 (Teaching Asian Languages).

University Oral Examination—General regulations governing the oral examination are found in the “Graduate Degrees” section of this bulletin. The candidate is examined on questions related to the dissertation, after acceptable parts of it have been completed in draft form.

Dissertation—The candidate must write a dissertation demonstrating ability to undertake original research based on primary materials in Chinese or Japanese.

Ph.D. MINOR

A student taking a minor in Asian Languages must complete at least 30 units of work within the department at the 200 and 300 level, chosen in consultation with a department adviser. The student must elect either Chinese or Japanese 201 unless the department is satisfied that work done elsewhere has provided similar training. The student must also pass a written examination in the Chinese or Japanese language.

STUDYING ABROAD

Students interested in a serious study of Japanese language, history, culture, and social organization are encouraged to apply to the Kyoto Center for Japanese Studies (KCJS), a September-to-April program managed by Stanford and including students from other American universities. Students with two years of Japanese may attend the full academic year, or Autumn or Spring semester only. In Spring Quarter, the Stanford Center for Technology and Innovation (SCTI), also in Kyoto, focuses on Japanese organizations and the political economy of research, development, and production of high technology and advanced industries, followed by a two-to-three-month internship in an agency, firm, or laboratory in Japan. For students in a technical major, two quarters of Modern Japanese or Japanese Language, Culture, and Communication B (5 units), or five quarters of Japanese Language, Culture and Communication A (3 units) fulfill the SCTI language requirement; for students in a non-technical major, five quarters of Japanese Language, Culture, and Communication B (5 units) fulfill the SCTI language requirement. For information about either program in Kyoto, students should contact the Overseas Studies office in Sweet Hall.

Students should take note of the programs of the Inter-University Board for Chinese Language Studies and the Inter-University Center for Japanese Studies located in Yokohama. Stanford is a member of these consortia programs. See “The Institute for International Studies” section in this bulletin.

Attention is also called to the exchange program established with the Department of Chinese at Peking University in Beijing. Those interested in the program should consult the chair of the department early in the academic year.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirement.

Since unavoidable changes occasionally have to be made in course offerings after the Stanford Bulletin has gone to print, students are advised to consult the department each quarter.

GENERAL

These courses are open to all undergraduate and graduate students, are taught in English, and do not require a knowledge of an Asian language.

51/151. Japanese Business Culture—Japanese group dynamics in industrial and corporate structures, negotiating styles, decision making,
and crisis management. Emphasis is on strategies to manage intercultural differences.

3 units, Win (Dasher)

71N. Stanford Introductory Seminar: Language and Gender in Japan—Myths and Reality—Preference to freshmen. The social position of women in Japan is believed to be reflected in a characteristically feminine form of the language. The past and present speech styles of women, linguistic ideology, class, generation differences, and identity in Japan. How belief and reality are refracted through mass media and fictional representations. Comparisons with male speech styles and with similar phenomena in other cultures. GER:3a,4c (DR:7)

3 units, Win (Matsumoto)

73/173. Chinese Language, Culture, and Society—Introduction to important functions of the language in Chinese culture and society. Topics: the origin of the language, developments of dialects, emergence of the standard, evolution of Chinese writing, language policies in Greater China, language and gender, formulaic expressions preferred in Chinese, etc. Recommended: one quarter of Chinese 1 or 1B, or equivalent. GER:3a,4a (DR:2 or 7)

4 units (Sun) not given 2000-01

75A. Visible Bodies, Unseen Bodies—Body and Ethics in Japanese Films—Innovative Japanese films, 1950s through the 90s. An examination of each filmmaker’s style and technique asks how ethics are implicated in the presentation of the body (e.g., bodies of women, athletes, criminals, etc.) and how visible and hidden dimensions of cinematic meaning subvert that initial interpretation.

4 units, Aut (Kage)

78. New Chinese Cinema—Introduction to the artistic films of contemporary mainland China, Taiwan, and Hong Kong. How the anxieties of culture are mediated through film. The issue of individual style. Film as ethnography, revisionist history, fantasy, and sculpting in time. GER:3a (DR:7)

4 units, not given 2000-01

78A. Chinese Cinema: The Fifth Generation—The works of a group of Chinese directors who became known in the early 1980s, explored through a chronological presentation of 16 major films and thematic discussions (narrative and non-narrative forms, symbolism, individuality, idiosyncrasy, satire, gender relations). Each film is contextualized within the literary and historical traditions of China. Films shown with English subtitles; readings in English, with optional readings distributed in Chinese.

4 units, Aut (Chou)

91. Traditional East Asian Civilization: China—Introduction to Chinese culture in a historical context. GER:3a,4a (DR:2 or 7)

5 units, Aut (Liu)

92. Traditional East Asian Civilization: Japan—Perspectives on Japan’s traditional civilization, focusing on the literature, religion, history, music, and visual arts of Japan’s medieval period (approximately 1200 to 1600 A.D.). The historical context from which the medieval period emerged, and some of the social and intellectual contributions it made to the development of modern Japan. The focus is on the society of samurai, priests, actors, and poets which created the rich culture of Japan’s middle ages. GER:3a,4a (DR:2 or 7)

5 units, Win (Hare)

95. The Japanese Language in Culture and Society—Introduction to the essentials of how the language functions in Japanese society and culture; salient characteristics are contrasted with English. Topics: politeness rules, conversational strategies, language and gender, formulaic expressions, and factors that make certain linguistic forms preferred in Japanese. Recommended: one quarter of Japanese 1 or equivalent, GER:3a (DR:7)

4 units (Matsumoto) not given 2000-01

98A. Desire and Modern Chinese Literature—The place of desire in 20th-century Chinese literature, focusing on the intertwined relationship between desire and, e.g., nationalism, nativism, modernity, and accelerated globalization. 98A deals with May Fourth authors (e.g., Ding Ling, Yu Dafu, Shen Congwen) and Mandarin Ducks and Butterflies (fiction; 98B looks at groundbreaking authors in the 1980s and ’90s. Recommended: knowledge of Chinese.

98A. 4 units (Sang) not given 2000-01

98B. 4 units (Sang) not given 2000-01

114. Haiku—Japanese haika from the 16th century to the present. Works of Basho, Buson, Issa, and other representative poets in English translation. Students exchange their readings of individual poems in class, learning how others have filled in the blanks in the text. Aspects of traditional Japanese aesthetics.

3 units (Staff) not given 2000-01

115. History of Japanese Popular Culture—Overview of current and historical trends in Japanese popular culture focusing on, e.g., puppet plays, woodblock prints, detective novels, theatrical reviews, comic books, and animated films. Emphasis is on how individual cultural products operate in conjunction with contemporaneous networks of social, technological, economic, and political signification. GER:4a (DR:2)

4 units, Spr (Reichert)

131/231. Chinese Poetry in Translation—The Chinese poetic tradition from the first millennium B.C. to the 14th century. Traditional verse forms representative of the classical tradition; highlights of the most distinguished poets. Topics on the history, language, and culture relevant to the literary works under study. GER:3a,4a (DR:2 or 7)

4 units, Win (Liu)

132/232. Chinese Fiction and Drama in Translation—Fiction and drama from early times to the 18th century, emphasizing literary and thematic discussions of major representative works available in English translation. GER:3a,4a (DR:2 or 7)

4 units, Spr (Schaberg)

133/233. Modern and Contemporary Chinese Literature in Translation—Required for Chinese majors. Readings in representative 20th-century works of fiction, drama, and poetry. GER:3a,4a (DR:2 or 9) (WIM)

4 units, Win (Lyell)

133A/233A. Introduction to Modern Chinese Literature—Developments in literature and literary theory in 20th-century China. The May Fourth Period, Mandarin Ducks and Butterfly urban popular fiction, the socialist realism era beginning in the 1930s and extending through the Yan’an days in the ’40s, the Cultural Revolution, and the rapidly changing literary forms of post-Mao society. Readings in English.

4 units (Sang) not given 2000-01

135/235. Classic Japanese Drama—The development of drama from early religious ritual forms through noh, puppet theater, and kabuki. Plays are analyzed as dramatic literature and in terms of performance. Texts are in English translation. Video tapes supplement lectures. GER:3a,4a (DR:2 or 7)

4 units, Aut (Hare)


4 units, Spr (Wallace)
137/237. Classical Japanese Fiction in Translation—Introduction to major works of prose narrative from premodern Japan (7th through mid-19th centuries) read in English translation, and emphasizing the historical, intellectual, and cultural context in which they were written. Works vary each year; may be repeated for credit with instructor's consent.
4 units (Staff) not given 2000-01

138/238. Modern Japanese Literature in Translation—Required for Japanese majors. Introduction to Japanese literature since 1868. Authors: Futabatei Shimei, Higuchi Ichiyo, Natsume Soseki, Yoshimoto Banana, etc. GER:3a, 4a (DR:2 or 7) (WIM)
Futabatei Shimei, Higuchi Ichiyo, Soseki, Tanizaki, and Mishima. GER:3a,4c (DR:7f)

141. Chinese Mythology and Lyrical Imagination—Introduction to Chinese mythology. The mythic narratives about Chinese ancestry, legendary dynasties, natural deities, and divine heroes in Chinese culture, and the dissemination of myths in poetry that reenact earlier legendary dynasties, natural deities, and divine heroes in Chinese culture. Approach is eclectic, incorporating Chinese and Western perspectives and drawing on theories of sinologists and general mythologists. GER:3a (DR:7 or 8)
4 units (Li) not given 2000-01

168. Introduction to Asian American Culture—(Enroll in Comparative Literature 168.)
5 units, Win (Palumbo-Liu)

181. Japanese Women Writers—Works in translation by women novelists and poets from the Meiji period to the present. Focus is on women's response to their marginal role in Japanese society and the literary establishment.
4 units (Staff) not given 2000-01

187/287. Romance, Desire, and Sexuality in Modern Japanese Literature—Constructions of romance, desire, and sexuality (sexual consciousness, love suicide, nanoshuku, etc.) in Edo Japan and how these paradigms are reconfigured by modern writers. Readings: Saikaku, Chikamatsu, Chiyo, Soseki, Tanizaki, and Mishima. GER:3a,4c (DR:71)
4 units (Reichert) not given 2000-01

200. Directed Reading—By instructor's assignment. For both Chinese and Japanese literatures.
units by arrangement, Aut, Win, Spr (Staff)

273. The Postmodern Pacific—(Enroll in Comparative Literature 273.)
5 units (Palumbo-Liu) not given 2000-01

372. Literary Theory and the Necessary Fiction of Asia—Examination of effective multiculturalism (fantasy, misunderstanding, exaggeration, projection, and mirror effects) in the theories about literature and culture. The enabling role of a hypothetical ‘other’ culture, integrating the lessons into our practice as students of Asia. Readings from Hegel, Nietzsche, Segalen, Pound, Husserl, Corbin, Heidegger, Poucalt, Derrida, de Man, Goetz, Said, Kristeva, Clifford, etc.
5 units (Saussy) not given 2000-01

CHINESE
FIRST- AND SECOND-YEAR LANGUAGE

Note—Students registering for the first time in a first- or second-year course must take a placement test if they have had any training in Chinese before entering Stanford. All entering students must take Part I (written) of the placement test on-line during the summer, followed by Part II (oral), to be administered on campus 9/26/00. Consult the Stanford Language Center for further information or see the web site.

1,2,3. First-Year Modern Chinese—Conversation, grammar, reading, elementary composition. Daily sections may be set at the beginning of the quarter to suit schedule requirements.
1. 5 units, Aut (Leung, Zeng, Staff)
2. 5 units, Win (Leung, Zeng, Staff)
3. 5 units, Spr (Leung, Zeng, Staff)

1B,2B,3B. First-Year Modern Chinese for Bilingual Students—For students with elementary comprehension and speaking skills. Provides a basic knowledge of modern Chinese literature and culture, improving conversation and grammar.
1B. 3 units, Aut (Rozelle, Chu)
2B. 3 units, Win (Rozelle, Chu)
3B. 3 units, Spr (Rozelle, Chu)

5. Intensive First-Year Modern Chinese—Equivalent to 1, 2, and 3 combined. Five weeks at Stanford and four weeks at Peking University.
8 units, Sum (Staff)

6,7,8. Beginning Conversational Chinese—Three-quarter sequence equips students with basic language skills in Mandarin to function abroad.
2 units, Aut, Win, Spr (Rozelle, Yu)

10,11,12. Beginning Southern Min (Taiwanese) Conversation
2 units, Aut, Win, Spr (Lin)

15,16,17. Beginning Cantonese Conversation—Three-quarter sequence designed to equip students with the basic language skills needed in everyday life situations.
2 units, Aut, Win, Spr (Leung)

21,22,23. Second-Year Modern Chinese—Further study in grammar, conversation, composition. Prerequisite: 3 or equivalent.
21. 5 units, Aut (Chung, Staff)
22. 5 units, Win (Chung, Staff)
23. 5 units, Spr (Chung, Staff)

21B,22B,23B. Second-Year Modern Chinese for Bilingual Students—For students with advanced comprehension and speaking skills, but lacking equivalent knowledge of grammar, reading, and writing Chinese characters. Equivalent to 21, 22, 23.
21B. 3 units, Aut (Zhu)
22B. 3 units, Win (Zhu)
23B. 3 units, Spr (Zhu)

25. Intensive Second-Year Modern Chinese—Equivalent to 21, 22, 23 combined. Five weeks at Stanford and four weeks at Peking University. Prerequisite: 3 or equivalent.
8 units, Sum (Staff)

27,28,29. Intermediate Chinese Conversation—Prerequisite: 3 or consent of instructor.
27. 2 units, Aut (Wu)
28. 2 units, Win (Wu)
29. 2 units, Spr (Wu)

51. Chinese Calligraphy—Practice in writing Chinese characters with a brush and learning different scripts. Limited enrollment. May be repeated for credit. Prerequisite: 3 or equivalent. (AU)
1-2 units, Win, Spr (Chuang)

99. Language Specials—With consent of department only. See instructor for section number.
1-3 units, Aut, Win, Spr (Staff)

ADVANCED
101,102,103. Third-Year Modern Chinese—Designed to help students solidify and further their communicative ability in Chinese through contact with various written and spoken styles of modern Chinese. Reading and discussion of authentic writings on cultural topics; newspaper reports,
radio, and TV broadcasts and films; on-line Chinese software and e-mail network to facilitate study. Prerequisite: 23 or equivalent.

5 units, Aut, Win, Spr (Chu)

101B,102B,103B. Third-Year Modern Chinese for Bilingual Students—For students with advanced listening and speaking abilities, but lacking equivalent knowledge in reading and writing. Equivalent of 101, 102, 103.

3 units, Aut, Win, Spr (Chu)

105. Intensive Modern Chinese—Equivalent to 101, 102, 103 combined. Five weeks at Stanford and four weeks at Peking University. Prerequisite: 23 or equivalent.

8 units, Sum (Staff)

121,122,123. Advanced Chinese Conversation—Prerequisite: 23 or equivalent.

121. 2 units, Aut (Chung)
122. 2 units, Win (Chung)
123. 2 units, Spr (Chung)

125,126,127. Beginning Classical Chinese—For students who need to develop a reading knowledge of Classical Chinese and have completed at least two years of Modern Chinese, or its equivalent. Students who have no background in Classical Chinese and are taking 127 to satisfy Chinese major requirements must begin with 125. Introduces basic grammar and commonly used vocabulary of classical Chinese. Prerequisite: 23 or equivalent.

125. 5 units, Aut (Sun)
126. 5 units, Win (Sun)
127. 5 units, Spr (Staff)

131,132,133. Business Chinese—Chinese for doing business (specialized vocabulary on commercial, economic, and business-related subjects). Materials include a text of formal conversations of typical business transactions, newspaper and journal articles, and TV news broadcasts on foreign trade and economic development in the world. Students achieve a familiarization with the technical language and business etiquette, and report in spoken and written Chinese based on their own research regarding recent economic developments, using sources in Chinese. Prerequisite: 23 or equivalent.

131. 3-4 units, Aut (Yu)
132. 3-4 units, Win (Yu)
133. 3-4 units, Spr (Yu)

191/291. The Structure of Modern Chinese—Designed to help students, who have had one year or more of modern Chinese, develop a sophisticated knowledge of Chinese grammar. Introduction to the grammatical structure of Chinese, focusing on syntax and semantics. Prerequisite: 3 or equivalent, or consent of instructor.

4 units, Spr (Sun)

192. The History of Chinese—Historical changes in the Chinese language in the last 2,000 years, emphasizing syntactic and semantic changes, and grammaticalization. Students use a computer corpus to do research on the history of Chinese. Prerequisite: 206 or consent of instructor.

4 units (Sun) not given 2000-01

193. Chinese Narratives of War and Honor—The origins in premodern history, fiction, and drama of one popular contemporary genre, the martial arts novel. Focus is on the varieties of heroic action, games with gender, visions of justice, and the continuity of these themes. Reading selections from Zuoqiu, Shiji, Shishuo xinyu, Tang wonder tales and transformation tales, Song and Ming loyalist tales, Yuan variety plays, Sanguoyanyi, and Shuihu Zhuan. Prerequisite: reading ability in Chinese.

4 units, Spr (Schaberg)

199. Individual Reading in Chinese—Asian Languages majors only. Prerequisite: 103 or consent of instructor.

4 units, Aut, Win, Spr (Staff)

GRADUATE

200. Directed Reading in Chinese—Prerequisite: 213 or 223, or consent of instructor.

units by arrangement, Aut, Win, Spr (Staff)

19. Proseminar—Introduction to the research tools and sources relevant to Chinese humanistic studies, taught as a workshop with participation by faculty from various departments. Prerequisite: knowledge of classical Chinese.

5 units (Sauvy, Staff) not given 2000-01

205,206,207.—For graduate students; see 125, 126, 127.

205. 5 units, Aut (Sun)
206. 5 units, Win (Sun)
207. 5 units, Spr (Sun)

208. Teaching Asian Languages—Lectures on teaching methods, class visits, and in-class teaching exercises prepare students for a career in teaching. May be repeated for credit. Pass/no credit only. Prerequisite: consent of mentor teacher.

2 units, Win (Sun)

211,212,213. Advanced Modern Chinese—For advanced learners, including those with overseas experience. Year-long sequence helps students become functional speakers, readers, and writers of modern Chinese through articles and essays from newspapers, magazines, scholarly journals, and the internet. Classes alternate between focus on cultural themes and on social science material; students may take both for 5 units or one part for reduced units. Prerequisite: minimum three years of Chinese language.

211. 5 units, Aut (Zhu)
212. 5 units, Win (Zhu)
213. 5 units, Spr (Zhu)

214. Introduction to Modern Chinese Literature I—Introduction to modern and contemporary Chinese literature (short stories, novels, plays, and poetry) through annotated texts. Students discuss materials in Chinese during class. Prerequisite: three years of modern Chinese.

5 units (Lyell) not given 2000-01

215. Introduction to Modern Chinese Literature II—Continuation of 214. Prerequisite: advanced Chinese.

5 units (Lyell) not given 2000-01

221,222,223. Advanced Classical Chinese—Prerequisite: 207 or equivalent.

221. Philosophical Texts
5 units, Aut (Sahleen)

222. Historical Narration
5 units (J. Wang) not given 2000-01

223. Literary Essays—Prerequisite: basic classical Chinese.

5 units, Win (Liu)


241. The Short Story—Prerequisite: three or four years of Chinese.

5 units (Lyell) not given 2000-01

242. Essay
5 units (Staff) not given 2000-01

243. The Novel
5 units (Lyell) not given 2000-01
244. Workshop in Translation—Students practice translating modern and contemporary Chinese works of literature into good English. Books and articles on the theory and practice of translation are required. Students use identical works and criticize and improve each other's work. Tool books are introduced and discussed. Prerequisite: advanced Chinese.

3-4 units, Win (Lyell)

251, 252, 253. Business Chinese—For graduate students; see 131, 132, 251, 252, 253.

251. 3-4 units, Aut (Yu)
252. 3-4 units, Win (Yu)
253. 3-4 units, Spr (Yu)

261. Sources of Chinese Poetry—Selections from the Book of Songs (c. 1000-500 B.C.) and the Songs of Ch’u (c. 400 B.C.), the two earliest anthologies of Chinese poetry.

4 units, Win (Schaberg)

262. Early Chinese Prose and Verse Genres—Readings from the 6th-century anthology Wen xuan, encompassing examples of the shi lyric, the fu rhapsody, critical essays, letters, deliberations, memorials, eulogies, etc. Focus is on the intrinsic interest of the texts and on the anthologists' reasons for singling them out as model compositions. Readings in classical Chinese. Prerequisite: 207 or consent of instructor.

4 units (Saussy) not given 2000-01

263. Lyric (shi) I—Selected readings in the early history of the lyric (shi), Han through Sui dynasties.

4 units (Liu) not given 2000-01

264. Lyric (shi) II—In-depth examination of T’ang poetry, focusing on major figures and forms.

4 units, Aut (Liu)

266. Chinese Tz’u Poetry (Song Lyrics)—Highlights from the Northern and Southern Sung periods. Patterns of generic development are correlated to social changes in historical context. Prerequisite: classical Chinese.

4 units (Liu) not given 2000-01

267. Methodologies in Approaching Modern and Contemporary Chinese Literature—Survey of the methodologies various scholars have employed in looking at, and writing about, modern and contemporary Chinese literature. Students are expected to write a reasoned summary of their own methodology.

5 units (Lyell) not given 2000-01

271, 272. Traditional Chinese Fiction—Selected readings in short stories and novels from early times to Ch’ing. Prerequisite: 127/207 or consent of instructor.

271. Short Stories
4 units (J. Wang) not given 2000-01
272. Novels
4 units (J. Wang) not given 2000-01

273. Chinese Drama—Selected readings in the dramatic works of the Yuan, Ming, and Ch’ing periods emphasizing literary, not theatrical qualities. Prerequisite: 207 or consent of instructor.

4 units (J. Wang) not given 2000-01

274. Apparitions of Women in Traditional Chinese Fiction—Selections from Lieni chuan (a Han Dynasty exemplar book), Sui Yangdi yanshi, Ni caizi shu, and Hong lou meng.

4 units (Saussy) not given 2000-01

286. Women Writers of Transnational China—Chinese women writers across national borders, focusing on contemporary novelists in Taiwan, Hong Kong, and the mainland. Their stylistic innovations and approaches to gender, culture, and national identities. The contours and boundaries of transnational China through the female imaginary. Writers: Wang Anyi, Lin Bai, Chen Ran, Zhu Tianxin, Li Ang, Chen Xue, Xi Xi, Anchee Min.

4 units (Saussy) not given 2000-01

291. The Structure of Modern Chinese—For graduate students; see 191.

4 units, Spr (Sun)

292. The History of Chinese—For graduate students; see 192.

4 units (Sun) not given 2000-01

299. Master’s Thesis or Translation—A total of 5 units taken in one or more quarters.

Aut, Win, Spr (Staff)

334. Seminar in Modern Chinese Literature—May be repeated for credit. Prerequisite: 243 or consent of instructor.

5 units (Lyell) not given 2000-01

371. Seminar in Chinese Literary Criticism—Readings/discussion of Chinese critical texts vis-a-vis relevant literary theories in the West. May be repeated for credit. Prerequisite: 127/207 or consent of instructor.

5 units (J. Wang) not given 2000-01

373. Seminar on the Tso-chuan—In-depth reading and study of the Tso-chuan as history and literature. Prerequisite: 127/207 or consent of instructor.

5 units (J. Wang) not given 2000-01


1-12 units, Aut, Win, Spr, Sum (Staff)

400. Advanced Language Training—Open only to students in the Inter-University Board for Chinese language programs in Beijing or Taipei. For more information, contact the consortium office at U.C. Berkeley (510) 642-3873.

1-15 units per quarter (Staff)

JAPANESE

FIRST- AND SECOND-YEAR LANGUAGE

Note—Students registering for the first time in a course must take a placement test if they have had any training in Japanese before entering Stanford. All entering students must take Part I (written) of the placement test on-line during the summer, followed by Part II (oral), to be administered on campus 9/26/00. Consult the Stanford Language Center for further information or see the web site.

1,2,3. First-Year Modern Japanese—Provides students with a solid foundation in grammar, conversation, reading, and basic composition (150 Kanji characters introduced).

1. 3 units, Aut (Busbin)
2. 5 units, Win (Busbin)
3. 5 units, Spr (Busbin)
5. Intensive First-Year Modern Japanese—Equivalent to 1, 2, and 3 combined.
   12 units, Sum (Staff)

7A/107A, 8A/108A, 9A/109A. First-Year Japanese Language, Culture, and Communication A—Strongly recommended for those interested in studying in Japan in a program such as SCTI. Focus is on the skills necessary to communicate successfully in Japanese, offering a practical means of acquiring a working knowledge of current Japanese. On-line listening exercises, audiovisual materials, and Kanji tutorials enhance students’ competence. At the completion of the course, students are able to talk, write, and read on topics such as personal history, experiences, familiar people, and places. Serves as the core course of the 5 units option of JLCC (7B/107B, 8B/108B, and 9B/109B). See http://www.stanford.edu/class/japanese/1fj7a.html.
   7A/107A. 3 units, Aut (Okano)
   8A/108A. 3 units, Win (Okano)
   9A/109A. 3 units, Spr (Okano)

7B/107B, 8B/108B, 9B/109B. First-Year Japanese Language, Culture, and Communication B—Strongly recommended for those interested in studying in Japan in a program such as SCTI. Enhances the students’ ability to use Japanese as a tool, building on language competence developed in 7A/107A, 8A/108A, 9A/109A. Two components focus on the cultural background necessary for successful communication, and on speaking and listening strategies for effective communication. See http://www.stanford.edu/class/japanese/1fj7b.html.
   7B/107B. 5 units, Aut (Okano, Shimizu, Mori)
   8B/108B. 5 units, Win (Okano, Shimizu, Mori)
   9B/109B. 5 units, Spr (Okano, Shimizu, Mori)

   17A/117A. 3 units, Win (Mori)
   18A/118A. 3 units, Win (Mori)
   19A/119A. 3 units, Spr (Mori)

   17B/117B. 5 units, Aut (Kubo, Shimizu)
   18B/118B. 5 units, Win (Kubo, Shimizu)
   19B/119B. 5 units, Spr (Kubo, Shimizu)

21,22,23. Second-Year Modern Japanese—Continuation of Japanese 3 (or 5). Students develop conversation and expression of ideas, master more advanced grammatical patterns, use 600 kanji, write simple compositions, and have an enhanced understanding of Japanese culture. At the completion of the sequence, students can read original source material. Prerequisite: 3 or equivalent.
   21. 5 units, Aut (Arao)
   22. 5 units, Win (Arao)
   23. 5 units, Spr (Arao)

25. Intensive Second-Year Modern Japanese—Equivalent to 21, 22, and 23 combined. Prerequisite: 3 or equivalent.
   12 units, Sum (Staff)

27,28,29. Intermediate Japanese Conversation—Develops oral proficiency (“survival level”) through the practice of simple sentence patterns, use of audiotapes, and oral presentations. Targeted for the practical use of Japanese. Prerequisite: 3 or consent of instructor.
   27. 2 units, Aut (Kuge)
   28. 2 units, Win (Nakamura)
   29. 2 units, Spr (Suzuki)

99. Language Specials—With consent of department only. See instructor for section number.
   1-5 units, Aut, Win, Spr (Staff)

101,102,103. Third-Year Modern Japanese—Third-year Japanese students move beyond acquisition of fundamental grammatical forms to reading and discussion of more complex material. Emphasis is on the accurate understanding of Japanese sentence structure in newspaper and journal articles; and readings from other genres (fiction, poetry, and essays). Polite language (keigo) skills and additional written and spoken patterns are mastered. Videos of everyday Japanese spoken at normal speed develop listening skills. Sequence course. Prerequisite: 23 or equivalent.
   101. 5 units, Aut (Arao)
   102. 5 units, Win (Arao)
   103. 5 units, Spr (Arao)

105. Intensive Third-Year Modern Japanese—Equivalent to 101, 102, and 103 combined. Prerequisite: 23 or equivalent.
   12 units, Sum (Staff)

111,112,113. Business Japanese—Conducted entirely in Japanese. Readings/discussions focus on business-related topics: cultural attitudes and approaches, work ethic, the stock market, import-export trade. Introduction to business letters, job interviews, and resume writing. May be repeated for credit. Prerequisite: 23 or 25 or consent of instructor.
   111. 3 units, Aut (Fukuma)
   112. 3 units, Win (Fukuma)
   113. 3 units, Spr (Fukuma)

114. Japanese for Business—Eight-week summer course designed to improve Japanese language skills as used in business circles in Japan. Focus is on cultural attitudes and approaches, the stock market, international trade, business letters, usage of honorific forms and expressions, telephone etiquette, etc. Entirely in Japanese. Prerequisite: 23 or equivalent.
   3 units, Sum (Staff)

121,122,123. Advanced Japanese Conversation—Creates “paragraph persons” with three focal points: fine tuning grammatical points, practice explaining things in Japanese, more fluency in speech. Use of audio/visual tapes, oral presentations, and discussions. Prerequisite: 23, 29, or consent of instructor.
   121. 2 units, Aut (Kubo)
   122. 2 units, Win (Kubo)
   123. 2 units, Spr (Kubo)

127A,128A,129A. Third-Year Japanese Language, Culture, and Communication A
   3 units, not given 2000-01

   127. 5 units, Aut (Shimizu)
   128. 5 units, Win (Shimizu)
   129. 5 units, Spr (Shimizu)
177/277. The Structure of Japanese—Linguistic analysis of the major grammatical structures of Japanese, focusing on their salient characteristics and functions. Prerequisites: two years of Japanese. Recommended: previous course in linguistics.

4 units, Aut (Matsumoto)

199. Individual Reading in Japanese—Asian Languages majors only. Prerequisite: 103 and consent of instructor.

4 units, Aut, Win, Spr (Staff)

GRADUATE

200. Directed Reading in Japanese—Prerequisite: 213 or equivalent. Prerequisite by arrangement. Aut, Win, Spr (Staff)

201. Proseminar—Bibliography and research methods in Japanese studies. Prerequisite: 103 or equivalent.

5 units (Staff) not given 2000-01

208. Teaching Asian Languages—Lectures on teaching methods, class visitations, and in-class teaching exercises prepare students for a career in teaching. May be repeated for credit. Prerequisite: consent of mentor teacher.

2 units, Win (Matsumoto)

211,212,213. Advanced Modern Japanese—Increase the ability to understand the structure of Japanese, become familiar with writings in different genres and styles, utilize such knowledge in writing, and discuss and express verbally questions and opinions on a variety of topics. Original writings, including fiction, essays, newspaper, and journal articles. Recommended taken in sequence. Prerequisite: 103 or equivalent.

211. 3-5 units, Aut (Matsumoto)
212. 3-5 units, Win (Kubo)
213. 3-5 units, Spr (Kubo)

246. Introduction to Classical Japanese—The basic principles of the classical literary language, concentrating on grammar and vocabulary. Prerequisite: 103 or equivalent.

5 units, Aut (Wallace)


247. 5 units, Win (Wallace)
248. 5 units, Spr (Reichert)

258. Japanese Buddhist Texts—(Enroll in Religious Studies 258.)

5 units, Spr (Bielefeldt)


4 units (Hare) not given 2000-01

280. Medieval Japanese Texts—Reading/discussion of selected works of the Kamakura and Muromachi periods. The problems of subjectivity in medieval texts in the writings of Shunzei, Dogen, Chomei, Zeami, and Ikkyu. Prerequisite: 247, 248 or equivalent.

4 units, Spr (Hare)

281. Japanese Pragmatics—Japanese language from the point of view of pragmatics, focusing on socio-cultural and discourse factors reflected in the choice of linguistic forms and their theoretical implications. Prerequisites: one year of Japanese, one course in linguistics or two years of Japanese, or consent of instructor.

4 units (Matsumoto) not given 2000-01

296. Readings in Modern Japanese Literature—Readings/discussion of works selected from contemporary authors. May be repeated for credit. Prerequisite: 213 or equivalent.

4 units, Aut (Reichert)


4 units (Staff) not given 2000-01

299. Master's Thesis or Translation—A total of 5 units, taken in one or more quarters.

Aut, Win, Spr (Staff)

330. Seminar in Heian Fiction—Advanced work in Heian fiction, concentrating on the function of poetry within fiction. Izumi Shikibu nikki is used as the base text to discuss how poems in rhetorical juxtaposition drive narrative development. Students complete a major paper. Prerequisite: 247 or 248.

5 units, Win (Wallace)

333. Seminar in Japanese Classical Drama—Advanced work in traditional dramatic forms, emphasizing the relation between text and performance in Noh, Joruri, and other performance narratives. Paper. Prerequisite: 247 or 248 or consent of instructor.

5 units (Hare) not given 2000-01

336. Seminar: Writing in Early Japan—Advanced work in the textualities of the 6th through mid-8th century Japan. Focus is on Man'yoshu, with attention to other early texts of literary, historical, and/or religious interest. Prerequisites: 246, and 247 or 248.

5 units (Hare) not given 2000-01

396. Seminar in Modern Japanese Literature—May be repeated for credit. Prerequisite: 213.

5 units, not given 2000-01


1-12 units, Aut, Win, Spr, Sum (Staff)

400. Advanced Language Training—Open only to students at the Yokohama Center. For more information, see the program description under the “Inter-University Center for Japanese Studies in Yokohama” section in this bulletin.

1-15 units per quarter (Staff)

KOREAN

1,2,3. First-Year Modern Korean—Elementary spoken and written Korean, equipping students with basic sentence patterns using basic vocabulary. Speaking, reading, writing, and listening comprehension with spoken language emphasized. Students develop the ability to say greetings, tell time, carry on limited conversation in classrooms, stores, and ask directions.

5 units, Aut, Win, Spr (Staff)

21,22,23. Second-Year Modern Korean—Intermediate spoken and written Korean, providing students with more complex sentences in advanced grammatical patterns, building on the grammatical structures taught and learned during first-year Korean. Students are expected to be competent in conversing on topics in daily life situations. Emphasis is on speaking, reading, writing, and listening comprehension. Students communicate at an intermediate level of topics in everyday life, read simple texts, and have a good knowledge of Korean culture.

5 units, Aut, Win, Spr (Staff)

101,102,103. Third-Year Modern Korean—Advanced spoken and written Korean. Develops communicative competence in reading, writ-
ing, speaking, and listening skills. Students build their vocabulary, heighten their reading ability, and strengthen aural/oral skills. Through weekly writing assignments, students learn about syntax, pragmatic ways of expression, and logical ways of thinking in Korean. Short story telling, free-group discussion, and acquaintance with Korean drama, movie, news, newspapers, and songs.

3 units, Aut, Win, Spr (Staff)

171/271. The Structure of Korean—Introduction to modern Korean linguistics, focusing on history, phonology and morphology, syntax and semantics, socio- and psycho-linguistics, pragmatics, language acquisition and pedagogy. Prerequisite: 3 or equivalent, or consent of instructor.

4 units, not given 2000-01

200. Directed Reading in Korean—Develops advanced reading and writing skills in modern Korean for future academic work. One discussion weekly, focusing on Korean linguistics; literature, culture, and history; economy and politics; Korean multimedia (CD-ROM and software); newspapers, magazines; Sino-Korean characters; or Korean conversation. Prerequisite: 103 or consent of instructor.

3 units by arrangement, Aut, Win, Spr (Staff)

208. Teaching Asian Languages—Lectures on teaching methods, class visitations, and in-class teaching exercises. Prepares students for a career in teaching. May be repeated for credit. Prerequisite: consent of instructor.

2 units, Win (Staff)

ASTRONOMY COURSE PROGRAM

Emeriti: (Professors) Ronald N. Bracewell, Von R. Eshleman, John R. Spreiter, Peter A. Sturnick
Committee in Charge: (Director) Vahé Petrosian; Roger W. Romani; Robert V. Wagner; Arthur B. C. Walker, Jr.
Professors: Blas Cabrera (Physics), Peter Michelson (Physics), Vahé Petrosian (Physics, Applied Physics), G. Leonard Tyler (Electrical Engineering), Robert V. Wagner (Physics), Arthur B. C. Walker, Jr. (Physics, Applied Physics)
Associate Professors: Roger W. Romani (Physics)
Assistant Professor: Sarah Church (Physics)
Professor (Research): Philip H. Scherrer

Although Stanford University does not have a degree program in astronomy or astrophysics, teaching and research in various branches of these disciplines is an ongoing activity in the departments of Applied Physics, Electrical Engineering, and Physics. For the convenience of students interested in the general areas of astronomy, astrophysics, and cosmology, a course program for undergraduate and graduate study is listed below.

The program is especially committed to providing introductory courses for the student who wishes to be informed about the fields of astronomy without the need for prerequisites beyond high school algebra and physics. Astronomy courses numbered below 100 are designed to serve this group of students.

Astronomy courses numbered 100-199 serve the student interested in an initial scientific study of astronomy.

The courses numbered 200 and above are for graduate students and advanced undergraduates, subject to prior approval by the course instructor.

UNDERGRADUATE PROGRAMS

The University does not offer a separate undergraduate major in astronomy. Students who intend to pursue graduate study in astronomy or space science are encouraged to major in physics, following the advanced sequence if possible, or in electrical engineering if the student has a strongly developed interest in radioscience. The course descriptions for these basic studies are listed under the appropriate department sections of this bulletin. Students desiring guidance in developing an astronomy-oriented course of study should contact the chair of the Astronomy Program Committee. The following courses are suitable for undergraduates and are recommended to students considering advanced study in astronomy or astrophysics: 100, Introduction to Observational and Laboratory Astronomy; 162 or EE 106, Planetary Exploration; 160, Introduction to Stellar and Galactic Astrophysics; 161, Extragalactic Astrophysics and Cosmology. Students planning study in astronomy beyond the B.S. are urged to take 260 and 262, Introduction to Astrophysics and to Gravitation, and to consider an undergraduate thesis (Astronomy 169) or honors thesis in an astrophysics related area. The above-mentioned courses are required for physics majors who choose the curriculum with concentration in astrophysics (see the “Physics” section of this bulletin). The student observatory, located in the hills to the west of the campus and equipped with a 24-inch and other small reflecting telescopes, is used for instruction of the observation oriented courses.

MINORS

The minor program in Astronomy is described in the “Physics” section of this bulletin. A non-technical minor, intended for students whose major does not require the Physics 40 series, requires 9 units of Physics courses (21, 23, 25) and 10 units of Astronomy courses (50 or 100, 3-4 units; 15, 16, 18N, 27, and 162, 6-7 units). The technical major for other students consists of Physics courses 27, 70, 100, 160, 161, and 162 (or EE 106). To be accepted to the minor program, students need to obtain an adviser selected from the faculty in the Astronomy Course Program. The minor declaration deadline is three quarters before graduation (that is, beginning Autumn Quarter if the student is graduating at the end of Spring Quarter). All courses for the minor must be taken at Stanford University, and a letter grade of "C" or better must be received for all units applied toward the minor.

GRADUATE PROGRAMS

Graduate programs in astronomy and astrophysics, and related topics, are carried out in the departments of Applied Physics, Electrical Engineering, and Physics. Students should consult the course listings, degree requirements, and research programs of these departments for more detailed information. For graduate research opportunities, see the “Center for Space Science and Astrophysics” section of this bulletin.

Stanford is a member of a consortium using the Hobby Eberly telescope, a 10-meter-class telescope located at McDonald Observatory in Texas. Opportunities to do research projects using this telescope are available for graduate students.

Students planning to conduct research in astronomy and astrophysics are required to take Physics 360 (Physics of Astrophysics) and at least one of the following: 361 (Stellar and Galactic Physics), 362 (Extragalactic Astrophysics and Cosmology), or 363 (Solar and Solar-Terrestrial Physics). Students lacking background in astrophysics, gravitation, and plasma physics are recommended to take Physics 260 and 262, Introduction to Astrophysics and to Gravitation, and 312 on Plasma Physics. Students with special interests in gravitation are recommended to take Physics 364, Advanced Gravitation.

Students interested in research programs in space physics involving spacecraft studies of the planets, their satellites, and their near-space environments should see the “Center for Space Science and Astrophysics” section of this bulletin.

COURSES

ELEMENTARY LECTURES

The following courses provide a descriptive knowledge of astronomical objects and astrophysics of the universe. Physics 15 and 16 are for students not majoring in the sciences and are taught in different quarters by different instructors, but are related in topic. Physics 27 is similar to 16, but at a more quantitative level. Physics 18N is a freshman seminar and 81Q and 82Q are sophomore dialogues.
15. The Nature of the Universe
3 units, Aut (Cabrera)

16. Cosmic Horizons
3 units, Win (Linde)

18N. Stanford Introductory Seminar: Revolutions in Concepts of the Cosmos
4 units, Spr (Staff)

27. Evolution of the Cosmos
3 units, not given 2000-01

81Q. Stanford Introductory Dialogue: Lookback Time in Cosmology
1 unit, Aut (Romani)

82Q. Stanford Introductory Dialogue: Expanding Cosmic Horizons
1 unit, Spr (Wagoner)

OBSERVATORY
The following courses are intended to familiarize students with observational methods and analysis of astronomical data. Physics 100 involves more advanced observations and is intended for students with some background in physics.

PHYSICS

50. Astronomy Laboratory and Observational Astronomy
3-4 units, Aut, Sum (Staff)

100. Introduction to Observational and Laboratory Astronomy
4 units, Spr (Staff)

ADVANCED UNDERGRADUATE
The following courses are for students with more advanced knowledge of basic physics and mathematics and form the core courses for a concentration in astrophysics for Physics majors.

ELECTRICAL ENGINEERING

106. Planetary Exploration
3 units, Spr (Fraser-Smith)

PHYSICS

160. Introduction to Stellar and Galactic Astrophysics
3 units, Aut (Petrosian)

161. Introduction to Extragalactic Astrophysics and Cosmology
3 units, Spr (Church)

169A,B,C. Independent Study in Astrophysics and Honors Thesis
1-9 units, Aut, Win, Spr (Staff)

GRADUATE

PHYSICS

260. Introduction to Astrophysics
3 units

261. Stellar and Galactic Astrophysics
3 units, Spr (Petrosian)

362. Extragalactic Astrophysics and Cosmology
3 units

363. Solar and Solar-Terrestrial Physics
3 units (Kosovichev) alternate years, given 2001-02

364. Advanced Gravitation
3 units, Aut (Wagoner)

463. Special Topics in Astrophysics
3 units

ATHLETICS, PHYSICAL EDUCATION, AND RECREATION

Emeriti: (Professor) Wesley K. Ruff; (Associate Professor) William P. Fehring; (Athletic Director) Joseph H. Ruetz; (Associate Director) Robert C. Young; (Assistant Director) Shirley Schoof

Athletic Director: Ted Leland
Associate Athletic Director, External Relations: Darrin Nelson
Associate Athletic Director, Finance and Operations: Debra Gore-Mann
Assistant Athletic Director, Operations and Events: Ray Purpur
Assistant Athletic Director, Development: Karen Recht
Assistant Athletic Director, Finance: Joe Mitchner
Assistant Athletic Director, Marketing, Tickets: Bob Carruesco
Assistant Athletic Director, Football Operational/Athletic Services: Scott Schuhmann
Assistant Athletic Director, Media Relations: Gary Migdol
Assistant Athletic Director, Student Services: Susan Burk
Assistant Athletic Director, Intercollegiate Sports and Championships: Earl Koberlein

Director, Major Gifts: John R. Kates
Director of Physical Education, Club Sports, Intramurals and Recreation: Sherry Posthumus

Senior Lecturers: Anne Gould, Elizabeth Weeks

Sports Directors: Aimee Baker (Crew, women), Steve Bourdow (Sailing), Bobby Clark (Soccer, men), Mark Cook (Gymnastics, women), Denise Corlett (Volleyball, women), Dante Dettamanti (Water Polo, men), Gail Emery (Synchronized Swimming), Lele Forood (Tennis, women), Richard Gould (Tennis, men), Sadao Hamada (Gymnastics, men), Chris Horpel (Wrestling), Heidi Connor Igoe (Lacrosse), Sheryl Johnson (Field Hockey), Skip Kenney (Swimming, men), Wieslaw Kujda (Crew, men), Vin Lannana (Track and Field/Cross Country), Mark Marquess (Baseball), Lisa Milgram (Fencing), Jeff Mitchell (Golf, men), Mike Montgomery (Basketball, men), Andy Nelson (Soccer, women), Ruben Nieves (Volleyball, men), Caroline O’Connor (Golf, women), Richard Quick (Swimming, women), John Rittman (Softball), Richard Schavone (Diving), John Tanner (Water Polo, women), Tara VanDerveer (Basketball, women), Tyrone Willingham (Football)

Sport Assistant Coaches: Lonni Alameda (Softball), Kyle Asano (Gymnastics, men), Kent Baer (Football), Nathalie Bartleson (Synchronized Swimming), Tom Brattan (Football), Steve Buddie (Wrestling), Patrick Burrows (Field Hockey), Josh Cohen (Volleyball, women), Rene Lyt Cook (Gymnastics, women), Bill Diedrick (Football), Dena Evans (Track and Field/Cross Country), Edrick Floreal (Track and Field), Kristine Franson (Crew, women), Tony Fuller (Basketball, men), Ross Gerry (Swimming, women), Tia Jackson (Basketball, women), John Kaity (Crew, men), Ted Knapp (Swimming, men), Eric Knopf (Sailing), John Kosty (Volleyball, men), Karen Middleton (Basketball, women), Chuck Moller (Football), Mark O’Brien (Baseball), Kim Oden (Volleyball, women), Susan Ortwein (Water Polo, women), Sara Pickering (Softball), Christy Plotner (Lacrosse),
The goals of the department's programs are to promote understanding of the value and role of physical activity as an important dimension of the human condition, to develop performance skills in sport, to develop the habit of participation, and to provide leadership opportunities in informal recreation through organized intramural competition, both men's and women's varsity teams. Those for men are baseball, basketball, crew, cross country, fencing, football, golf, gymnastics, sailing, soccer, swimming and diving, tennis, track and field, volleyball, water polo, and wrestling. Those for women are basketball, crew, cross country, fencing, field hockey, golf, gymnastics, lacrosse, sailing, soccer, softball, swimming and diving, synchronized swimming, tennis, track and field, volleyball, and water polo.

Both men's and women's teams are affiliated with the Pacific Ten Conference, one of the premier athletic conferences in the nation. Additional or alternative intercollegiate athletic competition is available for all teams.

The Stanford Club Sports program is coeducational. It provides competition in sports not included in the intercollegiate varsity program and instruction in classes or activities not included in the Physical Education program. It also develops student leadership in organizing, administering, and funding activities. The club program is actively supervised by the Director of Club Sports, but the emphasis is on student interest and participation to initiate, organize, and conduct the respective clubs. Those students in clubs that meet the criteria for inclusion in the formal curriculum may apply for units of credit. Club sport teams competing against other college, university, and/or club teams and requiring eligibility certification for their team members must make such arrangements through the Director of Club Sports.

FACILITIES

Athletic facilities are located throughout the campus. On the west side of campus are the Golf Course, the Golf Driving Range, the Red Barn Stables, Rothenbuhler Gym, the Sand Hill Intramural Fields, and the West Campus Tennis Courts. Central to the campus is the Tressider Fitness Center. On the east side of campus are the Arrillaga Family Sports Center, the Avery Aquatic Center, Burnham Pavilion, Cobb Track and Angell Field, DeGuere Courts, Encina Tennis Courts, the Ford Center for Sports and Recreation, the Maloney Fields, Maples Pavilion, the Stanford Stadium, Sunken Diamond, and Taube Tennis Stadium.

Off campus facilities include a sailing center and a rowing facility.

CURRICULUM AND SERVICES

The diverse instructional program strives to accommodate the sports interests of all undergraduate and graduate students. Only intercollegiate varsity men's and women's teams are limited to undergraduates. Homogeneous skill groupings and limited class sizes enable the beginning student or the advanced performer to achieve success within the limits of individual motivation and potential. Skill level in, and knowledge about, a specific activity as well as available space are the only limitations to enrollment. Physically disabled students are encouraged to contact Sherry Posthumus for enrollment advice.

Academic Credit—Activity classes carry 1 unit of credit for satisfactory completion of work. Although there is no limitation on the number of activity classes in which a student may enroll, no more than 8 units of these activity classes (and/or other University activity classes) may be applied toward undergraduate graduation requirements (see the "Undergraduate Degrees" section of this bulletin).

Auditing—No auditing is allowed in activity classes. Faculty and staff may take an activity class as space is available with instructor consent after student enrollment is completed.

Class Fees—Fees are charged for enrollment in all physical education classes and club sports.

Class fees are payable only by check or money order. Cash is not acceptable. Checks or money orders should be made payable to Stanford University. Fees are payable at the first, and are required by the second, class meeting for a student to remain in class. Late enrollees must submit fees no later than the second time they attend the class.

Full refund is given to students who drop a class during the first two weeks of classes and request a refund at that time. No refund is given if a student either neglects to request a refund under the conditions listed previously or drops the class after the second week.

Class Sign-Ups vs. Axess—Information on sign-up procedures can be found on the department's website. Students must attend the first class
meeting. If accepted into the class, they can register for that class through Axess.

**Deadline for Adding a Class**—Students who have never appeared in a class may not enroll in that class after the fourth class meeting has passed. Students may add the class after the fourth meeting if they have been in attendance and, for whatever reason, did not get registered until the fourth week (the University deadline for adding courses).

**Equipment**—Students provide their own rackets for tennis. Specific information on equipment and C recommended class attire is available from the department or instructor.

**Lockers**—Lockers are available for rent to faculty/staff and students at the Arrillaga Family Sports Center and Roble Gym. The fee for faculty/staff is $15 a quarter or $40 a year. The fee for students is $10 a quarter or $25 a year.

**COURSES**

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum). See www.stanford.edu/dept/pe for further information on course descriptions and sign-up procedures.

**PHYSICAL EDUCATION AND SPORTS THEORY**

190. **Analysis of Human Movement**—Overview of skeletal and muscular anatomy and a study of the mechanical principles of movement as related to efficient performance in aquatics, dance, and sports.

3 units, Aut, Win (Weeks)

**LEADERSHIP OPPORTUNITIES IN PHYSICAL EDUCATION**

81. **Manager: Athletic Team**—For student managers of intercollegiate teams. Prerequisite: consent of respective varsity team head coach. (AU)

1 unit, Aut, Win, Spr (Staff)

**AQUATIC ACTIVITY**

78. **Lifeguard Training**—Priority to those with summer jobs requiring certification and for those wishing to guard at Stanford during the year. Lifeguard characteristics and responsibilities, recognition of hazards and emergencies, patron and facility surveillance, interaction with the public, rescue skills. Community first aid and CPR for the professional rescuer. Bring letter from employer to first class meeting. Fee. Recertification weekend session in CPR/PR and LGT/FA in late April or early May. See web site. Prerequisite: pass swim test (swimmer/advanced swimmer level).

2 units, Spr (Weeks)

106. **Sailing: Beginning Keelboat**—Basic skills, theory, and techniques to enable beginners to sail with confidence. Emphasis is on safety and seamanship skills. Fee. (AU)

1 unit, Aut, Spr (Bourdow)

107. **Sailing: Beginning Dinghy**—Basic skills, theory, and techniques to enable beginners to sail with confidence in small centerboard boats. Fee. (AU)

1 unit, Aut, Spr (Bourdow)

108. **Sailing: Intermediate**—Refine skills. Introduction to racing. Fee. Prerequisite: consent of instructor. (AU)

1 unit, Aut, Spr (Bourdow)

109. **Sailing: Advanced**—Refinement of heavy weather sailing skills, with emphasis on racing. Fee. Prerequisite: 108 or consent of instructor. (AU)

1 unit, Spr (Bourdow)

130. **Swimming I: Beginning**—For non-swimmers or those who can swim about 10 yards but are not comfortable in deep water. Instruction in safety skills, front crawl, and a back stroke. Additional strokes introduced as ability warrants. Fee. (AU)

1 unit, Aut, Spr (Dettamanti, Weeks)

131. **Swimming II: Advanced Beginning**—For those with limited swimming ability and safety skills who may not be fully comfortable in deep water. Work on safety skills, crawl, and elementary backstroke or back crawl. Introduction to sidestroke and breaststroke. Improve skills and increase time and distance of swim. Prerequisite: ability to swim 25-50 yards on front and on back reasonably comfortably. Fee. (AU)

1 unit, Aut, Win, Spr (Gerry, Weeks)

132. **Swimming III: Intermediate**—Continued work on crawl, elementary backstroke, backstroke, and sidestroke. Safety skill work as needed. Introduction to or review of breaststroke. Open turns. Introduction to butterfly, flip turn, and conditioning. Fee. Prerequisites: fair technique in crawl, elementary backstroke, backstroke; some sidestroke and breaststroke; ability to swim approximately 100-200 yards continuously by mixing strokes. (AU)

1 unit, Aut, Win, Spr (Gerry, Weeks)

133. **Swimming IV: Advanced**—Review and refine all basic strokes and safety skills. Introduction to or review of butterfly and flip turn. Stroke drills and information on conditioning and designing individual workouts. Prerequisite: average to good strokes; ability to swim approximately 400-500 yards continuously. Fee. (AU)

1 unit, Aut, Win, Spr (Dettamanti, Quick, Tanner)

166. **Water Polo: Beginning**—Introduction to basic skills and game play. For those who have never played or have had limited experience. Fee. (AU)

1 unit, Spr (Dettamanti)

167. **Water Polo: Intermediate/Advanced**—Further work on skills. Game strategies. Fee. (AU)

1 unit, Aut, Spr (Dettamanti, Tanner)

**FITNESS, INDIVIDUAL, AND TEAM SPORT ACTIVITIES**

2. **Aerobics**—High-powered strength building class. Focus is on body awareness, balance of strength and flexibility through continuous body motion and cardiovascular enhancement. All levels. Fee. (AU)

1 unit, Aut, Win, Spr (Coughlin)

21. **Conditioning Advanced**—Active participation in conditioning exercises advancing from aerobic to intense anaerobic interval conditioning. Offered by appointment. Prerequisite: pass a physical exam prior to enrollment. (AU)

1 unit, Win (Wateska)

31. **Cross Training for Overall Fitness**—Participate in a variety of activities (e.g., track intervals, sprints, plyometrics) designed to promote cardiovascular fitness and overall conditioning. Fee (AU)

1 unit, Au (Evans)

38. **Fencing: Beginning**—The sport of swordmanship develops quick hands, strong legs, and a strategic mind. Basic footwork, handwork, and bouting. Emphasis is on foil technique. All equipment provided. Fee. (AU)

1 unit, Aut, Win, Spr (Milgram, Pogosov)

39. **Fencing: Intermediate/Advanced**—Continuation of 38; learn advanced footwork and handwork. Strategy and bouting. Introduction to
40. Fencing: Saber Class—Continuation of 38. Learn saber technique, the fastest of the three weapons. Saber takes speed, quick reflexes and a sly, strategic mind. All equipment provided. Fee. Prerequisite: 38 or consent of instructor. (AU)

1 unit, Win (Johnson)

45. Field Hockey: Advanced for Women—Techniques and skills under competitive pressure. Must know team strategies and positioning. Fee. (AU)

1 unit, Win (Pogosov)

52. Golf: Beginning—The fundamentals of the golf swing; introduction to putting, chipping, sand play. Golf etiquette and knowledge of rules enable a beginner to play a round of golf. Fee. (AU)

1 unit, Aut, Win, Spr (Hamada, Miller, Uchiyama)

53. Golf: Advanced Beginning—Further development of the golf swing and short game. How to practice effectively and gain the confidence to play a round of golf. Rules and etiquette. Prerequisite: 52 or previous golf experience. Fee. (AU)

1 unit, Aut, Win, Spr (Hamada, Miller)

54. Golf: Intermediate—Improvement through the use of drills and practice on all facets of golf game. Utilization of these skills in the game. Lower your score and manage your game on the course. Fee. Prerequisite: 52 or the equivalent. (AU)

1 unit, Aut, Win, Spr (Hamada, Miller)

55. Golf: Advanced—Understand and refine the golf swing and increase power, distance, and accuracy. Course management, mental preparation, visualization techniques. Fee. Prerequisites: 54 or experience playing and practicing, and the ability to hit shots with relative accuracy and distance. (AU)

1 unit, Aut, Win, Spr (Miller)

59. Gymnastics: Beginning—Fundamental gymnastics movement for men and women, including flexibility and strength exercises taught on the Olympic apparatus (e.g., floor, balance beam, bars, rings, etc.). Fee. (AU)

1 unit, Aut, Win, Spr (Cook, Hamada)

60. Gymnastics: Intermediate/Advanced—For students who have completed 59 or have a background in gymnastics. Emphasis is on tumbling and somersaulting. Group work and individualized instruction for men and women. Limited apparatus work. Fee. (AU)

1 unit, Aut, Win, Spr (Cook)

65. Horsemanship: Beginning Riding—No background or very little. Includes walk, trot, and canter. Fee. (AU)

1 unit, Aut, Win, Spr (Saxe, Staff)

66. Horsemanship: Advanced Beginning Riding—Can walk and trot, but not with very secure seat. Gymnastic work develops position and rhythm. Fee. (AU)

1 unit, Aut, Win, Spr (Saxe, Staff)

68. Horsemanship: Intermediate Riding and Jumping—Work at the walk, trot, canter. Cross rails up to two foot jumps. Fee. (AU)

1 unit, Aut, Win, Spr (Saxe, Staff)

73. Interval Training—For students who want to improve their overall fitness level. Active participation in workouts include brief periods of high intensity exercise interspersed with lower-intensity exercise or rest. Short duration agility runs, weight lifting, and cardiovascular improve-
experience. NTRP rating of 3.0 or equivalent. Fee. (AU)

1 unit, Aut, Win, Spr (Staff)

151. Tennis: Advanced—Review of fundamental strokes. Drills emphasize footwork, serve and return, approach shots, volleys, lobs, and overheads. Strategy for competition in singles and doubles. Prerequisites: well above average stroking and game playing ability; NTRP rating above 4.0 or equivalent. Fee. (AU)

1 unit, Aut, Win, Spr (Staff)

152. Tennis: Tournament—Advanced drills and practice sessions for tournament-experienced players of near-varsity-level ability. Tryouts at Taube Tennis Stadium in Autumn Quarter for autumn enrollment and background in computers and statistics. (AU)

Prerequisite: consent of instructor. Recommended: excellent knowledge of the game. Assist players and coaches by collecting data on player performance. Fee. Prerequisite: consent of instructor. (AU)

1 unit, Aut, Win, Spr (Whittington)

154. Tennis: Analysis—Use of computer for analyzing tennis matches. Assist players and coaches by collecting data on player performance. Prerequisite: consent of instructor. Recommended: excellent knowledge of tennis, background in computers and statistics. (AU)

2 units, Aut, Win, Spr (Forwood, D. Gould)

159. Volleyball: Sand—For intermediate and advanced players to improve skills and game playing strategy in both two- and four-person sand volleyball. Prerequisites: 161 and/or 162, or strong skills and general knowledge of indoor volleyball. Fee. (AU)

1 unit, Spr (Kosty)


1 unit, Aut, Win, Spr (Corlett, Kosty)

161. Volleyball: Intermediate—Drills to improve skills and game playing strategy. As ability indicates, more emphasis on team play and strategy. Fee. (AU)

1 unit, Aut, Win, Spr (Kosty, Nieves)

162. Volleyball: Advanced—Refine all skills, emphasizing offensive and defensive team play. Fee. Prerequisites: strong skills and general knowledge of team concepts. (AU)

1 unit, Aut, Win, Spr (Nieves)


1 unit, Aut, Win, Spr (Nieves)

175. Weight Training: Intermediate—Review of basic exercises and techniques. Emphasis is on individualized programs and learning the use of all available machines and free weights. Further discussion on exercise physiology. Fee. Prerequisite: 174 or thorough knowledge of basic weight training principles. (AU)

1 unit, Aut, Win, Spr (Staff)

177. Weight Training for Women—All levels welcome, but designed for the beginner. Introduction to the techniques and equipment for weight training. Emphasis is on stretching, proper form and progressions, and injury prevention. The basics of the physiology of strength training and planning individual programs. Fee. (AU)

1 unit, Aut, Win, Spr (Staff)

183. Wrestling: Beginning/Intermediate—Introduces intercollegiate wrestling. Conditioning, cultivating the spirit of one-on-one competition. Basic skills and high-level sequences of upper- and lower-body technique. Fee. (AU)

1 unit, Spr (Horpel)

188. Yoga: Beginning—Challenging practice designed for beginning-intermediate student. Focus is on a completely integrated and balanced body. Promotes increased flexibility; strengthens skeletal, muscular, and nervous systems; improves circulation; releases tension and stress; improves concentration and clarity of mind. Fee. (AU)

1 unit, Aut, Win, Spr (Coughlin)

189. Yoga: Intermediate—Builds and expands on the basic asanas. Student should be comfortable with the beginning class and ready for more challenging poses. More inverted poses, i.e., shoulder stand. Range of motion is increased as is length of time in poses. Deeper understanding of pranayama. Fee. Prerequisite: beginning yoga or previous yoga experience. (AU)

1 unit, Aut, Win, Spr (Coughlin)

INTERCOLLEGIATE ATHLETIC TEAMS

Varsity men's and women's teams in PAC-10 are for the highly talented and motivated undergraduate student. Unless specified, team tryouts are open to men and women students.

14V. Baseball: Varsity-Men's team. (AU)

1-2 units, Aut, Win, Spr (Marquess, Stotz)

17V. Basketball: Varsity-Men's and women's teams. (AU)

1-2 units, Aut, Win (Montgomery, Staff) men's team

1 unit, Win (Van Derveer, Staff) women's team

26V. Crew: Varsity-Men's and women's teams. (AU)

1-2 units, Aut, Win (Kujda) men's team

1 unit, Win, Spr (Baker) women's team

29V. Cross Country: Varsity-Men's and women's teams. (AU)

1-2 units, Aut (Lananna)

35V. Diving: Varsity-Men's and women's teams. (AU)

1-2 units, Aut, Win (Schavone)

41V. Fencing: Varsity-Men's and women's teams. (AU)

1-2 units, Aut, Win (Emery)

49V. Football: Varsity-Men's team. (AU)

1 unit, Win, Spr (Cook) women's team

75V. Lacrosse: Varsity-Men's and women's teams. (AU)

1-2 units, Aut, Win, Spr (Igoe)

62V. Gymnastics: Varsity-Men's and women's teams. (AU)

1-2 units, Aut, Win, Spr (Mitchell) men's team

1 unit, Win (O'Connor) women's team

75V. Lacrosse: Varsity-Women's team. (AU)

1-2 units, Aut, Win, Spr (Igoe)

111V. Sailing: Varsity-Coed and women's teams. (AU)

1-2 units, Aut, Win, Spr (Bourdow)

124V. Soccer: Varsity-Men's and women's teams. (AU)

1-2 units, Aut, Spr (Clark) men's team

1 unit, Spr (Nelson) women's team

127V. Softball: Varsity-Women's team. (AU)

1-2 units, Aut, Win, Spr (Rittman)

136V. Synchronized Swimming—Women's team. (AU)

1 unit, Win (Emery)
137V. Swimming: Varsity—Men’s and women’s teams. (AU)
   1-2 units, Aut, Win, Spr (Kennedy) men’s team
   Aut, Win, Spr (Quick) women’s team

153V. Tennis: Varsity—Men’s and women’s teams. (AU)
   1-2 units, Aut, Win, Spr (Gould) men’s team
   Aut, Win, Spr (Forood) women’s team

157V. Track and Field: Varsity—Men’s and women’s teams. (AU)
   1-2 units, Aut, Win, Spr

163V. Volleyball: Varsity—Men’s and women’s teams. (AU)
   1-2 units, Aut, Win, Spr (Nieves) men’s team
   Aut, Win, Spr (Corlett) women’s team

168V. Water Polo: Varsity—Men’s and women’s teams. (AU)
   1-2 units, Aut, Win, Spr (Dettamanti) men’s team
   Aut, Win, Spr (Tanner) women’s team

184V. Wrestling: Varsity—Men’s team. (AU)
   1-2 units, Aut, Win, Spr (Horpel)

CLUB SPORTS

The Stanford Club Sports Program is affiliated with the department but is initiated, organized, and conducted by students. All clubs are coeducational except as specified. Clubs, whose instructional classes meet the criteria for academic credit, are scheduled for meeting times as published each quarter in the Time Schedule. For additional information, contact the Club Sports Director.

11C. Badminton Club Team—(AU)
   1 unit, Aut, Win, Spr

32C. Cycling Club Team—(AU)
   1 unit, Aut, Win, Spr

36C. Equestrian Club Team—(AU)
   1 unit, Aut, Win, Spr

70C. Horse Polo Club Team—(AU)
   1 unit, Aut, Win, Spr

72C. Ice Hockey Club Team—Men. (AU)
   1 unit, Aut, Win

75C. Lacrosse Club Team—Men. (AU)
   1 unit, Aut, Win, Spr

88C. Judo Club Team—(AU)
   1 unit, Aut, Win, Spr

104C. Rugby Club Teams—Men’s and women’s teams. (AU)
   1 unit, Aut, Win

118C. Ski Club Team—(AU)
   1 unit, Win

158C. Ultimate Frisbee Team—Women. (AU)
   1 unit, Aut, Win, Spr

Additional clubs (Cricket, Squash, Table Tennis, and Ultimate Frisbee—men) schedule activities each quarter for no credit.

BIOLOGICAL SCIENCES

Emeriti: (Professors) Winslow R. Briggs, David D. Perkins, David C. Regnery, Robert Schimke, Dow O. Woodward; Professor (Research) R. Paul Levine; (by courtesy) Peter Ray, Charles Yanofsky

Chair: H. Craig Heller


Associate Professors: Barbara A. Block, Martha S. Cyert, Deborah M. Gordon, Susan K. McConnell, Michael A. Simon

Assistant Professors: David Ackery, Brenda Bohannan, Guowei Fang, Judith Frydman, Elizabeth A. Hadly, Liqun Luo, Fiorenza Micheli, Dmitri Petrov, Michael F. Rexach, Tim Stearns

Associate Professor (Teaching): Carol L. Boggs

Professor (Research): Robert Metzenberg, Jr.

Courtesy Professors: Joseph Berry, Richard G. Klein, Irving L. Weissman

Courtesy Associate Professors: Christopher B. Field, Arthur R. Gorman

Courtesy Assistant Professor: Alfred Spormann

Lecturers: Kristin Black, Shyamala D. Malladi, Laura McIntosh, James Watanabe, Melanie Yelton

Consulting Professor: Terrence M. Gosliner

Consulting Associate Professor: Nina G. Jablonski

Visiting Associate Professor: Alex Meyer

Librarian: Michael Newman

The facilities and personnel of the Department of Biological Sciences are housed in the Gilbert Building, Herrin Laboratories, Herrin Hall, the Jasper Ridge Biological Preserve on the main campus, and at the Hopkins Marine Station in Pacific Grove on Monterey Bay.

The department provides: (1) courses designed for the nonmajor, (2) a major program leading to the B.S. degree, (3) a minor program, (4) a coterminous program leading to the M.S. degree, (5) a terminal program leading to the M.S. degree, and (6) a program leading to the Ph.D. degree.

Course work and laboratory instruction in the Department of Biological Sciences conform to the "Policy on the Use of Vertebrate Animals in Teaching Activities" section of this bulletin.

The Jasper Ridge Biological Preserve is a 1,200-acre natural area containing an unusual diversity of plant communities. It is managed solely for teaching and research purposes and is available to investigators from various institutions. Stanford-based research at Jasper Ridge currently concentrates on physiological, ecological, and population studies.

Special laboratory facilities for marine research are described in the pamphlet Hopkins Marine Station, available at the department’s Student Services office (Gilbert 108) or from Hopkins Marine Station.

The department’s large collections of plants (Dudley Herbarium), fishes, reptiles, and amphibians, as well as smaller collections of birds, mammals, and invertebrates, are housed at the California Academy of Sciences in San Francisco, where they, and extensive collections of the academy, are available to those interested in the systematics of these groups. Entomological collections, restricted to those being used in particular research projects, are housed in the Herrin Laboratories. No general collections are maintained except for teaching purposes.

The Falconer Biology Library in Herrin Hall contains over 1,200 current subscriptions and an extensive collection of monographs and reference works. A specialized library is maintained at the Hopkins Marine Station.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

ADvising

Most members of the Biological Sciences faculty are available for advising on such academic matters as choice of courses and career plans. The Student Services office maintains a current list of faculty advisers, advising schedules, and research interests.
The Student Services office is prepared to answer questions on administrative matters, such as requirements for the major, approved out-of-department electives, transfer course evaluations, and petition procedures. This office also distributes the department’s Bachelor of Science Handbook, which delineates policies and requirements, as well as other department forms and information handouts.

Each undergraduate student interested in the major in Biological Sciences is required to select a department adviser as part of the major declaration process. Students who plan to attend medical or graduate school, enroll in the honors or coterminal programs, take courses at Hopkins Marine Station, or attend one of the overseas campuses will find their faculty adviser particularly helpful.

REQUIREMENTS

Candidates for the B.S. degree must complete:

Core Courses and Electives—

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology 44X</td>
<td>4</td>
</tr>
<tr>
<td>Biology 44Y (may be replaced by 4 units of 175H)</td>
<td>4</td>
</tr>
<tr>
<td>Biology 41 or 51*</td>
<td>5</td>
</tr>
<tr>
<td>Biology 42 or 52*</td>
<td>5</td>
</tr>
<tr>
<td>Biology 43 or 53*</td>
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<td>Total</td>
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</tr>
<tr>
<td>Electives</td>
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</tr>
</tbody>
</table>

* Letter grade only.

Required Cognate Courses—

Students may take up to two cognate courses credit/no credit (CR/NC).

1. Introductory, organic, and physical chemistry with lab: Chemistry 31 (or 32), 33, 35, 36, 130 (or 132), 131, 135 (or 171). For those interested in ecology and evolution biology, an advanced math course of 100-level or above may be substituted for 130 or 132.

2. General Physics: Physics 21, 22, 23, 24; or 41, 43, 45, 47.

3. Math through calculus: Mathematics 19, 20, 21; or 41, 42.

4. One additional course in mathematics, statistics, or computer science: Mathematics 51 or beyond; Biology 141 (if taken to fulfill additional cognate requirement, this does not count toward the 24 elective unit requirement), or Psychology 10; Statistics 60 or beyond; or Computer Science 106A or X.

Electives must be 100-level or above and selected from the offerings in the Department of Biological Sciences or from the list of approved out-of-department electives. This list may be obtained from the Student Services office. Biology majors must include at least two courses of at least 3 units each taught by two different Biological Sciences faculty members in the courses they take to fulfill the department’s 24 elective unit requirement. Courses that are “team taught” by a Biological Sciences professor and a non-Biological Sciences professor will only count as 1/2 credit towards the faculty requirement. A list of Biological Sciences professors is available from the Student Services office.

The program for the junior and senior year should include a total of 24 elective units beyond the core. The courses making up these units should include at least one course from at least three of the following four areas. The rest of the 24 units can include more courses from this central menu, courses available in diverse areas directly after the core, or advanced courses for which "menu" courses are prerequisites. A complete central menu course listing including inactive and alternate year courses is available in the Student Services office.

Active central menu courses are:

1. Molecular
   Biochemistry: Biochem. 200
   Cell Biology—Molecular Organization: Bio. 128*
   Developmental Genetics: Bio. 132*
   Genetics: Bio. 118*
   Molecular Biology: Biochem. 201
   Prokaryote Genetics: Bio. 133*

2. Cell/Developmental
   Cell Biology—Cellular Dynamics: Bio. 129
   Cell Biology—Molecular Organization: Bio. 128*

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Physiology: Bio. 160H</td>
<td></td>
</tr>
<tr>
<td>Developmental Genetics: Bio. 132*</td>
<td></td>
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<tr>
<td>Genetics: Bio. 118*</td>
<td></td>
</tr>
<tr>
<td>Prokaryote Genetics: Bio. 133*</td>
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</tr>
</tbody>
</table>

3. Organismal
   Comparative Animal Physiology: Bio. 162H
   Ecological and Evolutionary Physiology: Bio. 171H
   Ecology and Evolution of Plants: Bio. 138
   Human Physiology: Bio. 112
   Invertebrate Zoology: Bio. 161H
   Microbiology: Microbio. & Immun. 185
   Neurobiology: Bio. 153
   Neurobiology: Bio. 154
   Neurobiology & Behavior: Bio. 169H
   Plant Physiology: Bio. 256
   Vertebrate Biology: Bio. 140 (lecture only)
   Viruses: Bio. 213

4. Ecology and Evolution
   Biogeography: Bio. 121
   Evolutionary Paleobiology: Bio. 136
   Behavioral Ecology: Bio. 145
   Oceanic Biology: Bio. 163H
   Principles of Ecology: Bio. 142

   Principles and Practice of Biosystematics: Bio. 184

* May be used to satisfy either area I or area II requirement.

No more than 6 units from any combination of individual instruction courses (175H, 198, 199, 290, 291, or 300) may be applied toward the total number of elective units. No more than 6 units applied toward the elective unit requirement may be taken CR/NC.

Students intending to pursue research careers in biology, especially in ecology, population genetics, or theoretical biology, should be aware that Mathematics 19, 20, 21, or Mathematics 41, 42 are minimum math requirements for the B.S. degree in Biological Sciences. Substantial additional training in mathematics, including differential equations, linear algebra, and probability theory, is often highly advisable. Students should consult the Biological Sciences faculty to discuss individual needs.

Additionally, even though only two or three quarters of physics are required, students should be aware that many graduate and professional schools (for example, medicine and education) require a year of general physics with a lab. Biological Sciences majors are therefore advised to take the year-long physics sequence Physics 21, 22, 23, 24, 25, 26 (or Physics 41, 43, 45, 46, 47, 48).

For students considering residence at Hopkins Marine Station during the junior or senior year, or an overseas program, the department recommends fulfilling as many University General Education Requirements as possible in the first two years at Stanford.

**TYPICAL SCHEDULE FOR A FOUR-YEAR MINIMUM PROGRAM**

**FIRST YEAR**

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
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<td>Chem. 31, 33, 35, 36.</td>
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<tr>
<td>Mathematics 19, 20, 21.</td>
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<td>General Education Requirements or electives</td>
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<tr>
<td>Totals</td>
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**SECOND YEAR**

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<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
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<tr>
<td>Bio. 41, Principles of Biology*</td>
<td>5</td>
</tr>
<tr>
<td>Bio. 42, Principles of Biology*</td>
<td>5</td>
</tr>
<tr>
<td>Bio. 43, Principles of Biology*</td>
<td>5</td>
</tr>
<tr>
<td>Bio. 44, Core Experimental Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 130 or 132, 131, 135 (or 171)</td>
<td>8</td>
</tr>
<tr>
<td>General Education Requirements or electives</td>
<td>3 5 8</td>
</tr>
<tr>
<td>Totals</td>
<td>16 17 17</td>
</tr>
</tbody>
</table>

* Letter grade only.

**THIRD YEAR**

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
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<tr>
<td>Physics 21, 22, 23, 24.</td>
<td>4 4 4</td>
</tr>
<tr>
<td>General Education Requirements or electives</td>
<td>11 11 11</td>
</tr>
</tbody>
</table>
TRANSFER STUDENTS

Because of differences between Stanford undergraduate courses and prerequisites and those of many other institutions, transfer students may face problems not encountered by entering freshmen. Transfer students are strongly urged to visit the Student Services office in Gilbert 108 during Transfer Orientation to obtain information on credit evaluations. Course catalogs, syllabi, and/or lecture notes from the former institution are necessary in the evaluation and accreditation process. Transfer students are encouraged to find a faculty adviser soon after arrival.

All transfer courses intended to fulfill department requirements must be evaluated on Evaluation of Transfer Course Content forms (available in the Student Services office), which is kept in the student's file. This department procedure is in addition to the process of having units earned at other institutions transferred for Stanford credit and which appear on the Stanford transcript.

The department authorizes transfer credit only for courses whose content parallels the Stanford courses and that have comparable prerequisites (not merely a comparable course title). To substitute a course taken elsewhere for an upper-division Stanford course, course content must be approved by a department faculty member teaching in the area of the course. Submit as complete a course description as practical (including prerequisites and their descriptions) using the Evaluation of Course Content form available in the Student Services office before taking an off-campus course. Credit for natural history, culture-biology, and similar courses is rarely appropriate and can be obtained only by meeting the same criteria outlined above. Verification of performance and the number of units are determined after completing the course. Students must provide exams, reading lists, term papers, and other materials for the evaluation. Credit is not allowed for projects for which the student was paid, nor is credit allowed for work of a purely technical or clinical nature.

MINORS

Minor declaration forms must be submitted to the department, via Axess, no later than two quarters prior to the student’s intended quarter of degree conferral. The Biological Sciences minor requires a minimum of six courses meeting the following criteria:

1. All courses must be taken for a letter grade.
2. All courses must be worth 3 or more units.
3. All courses, other than the Biology Core (51, 52, or 53; or 41, 42, or 43), must be at or above the 100-level.
4. Courses used to fulfill the minor may not be used to fulfill any other department degree requirements (minor or major).
5. At least one course from the Biology Core must be taken.
6. The Biology Core Laboratory (44X and 44Y) does not count towards the minor degree.
7. All courses must be Department of Biological Sciences elective courses or recognized out-of-department elective courses. (See the “Out-of-Department Electives” list available in the Student Services Office.)
8. Elective credit for research (199) is limited to a maximum of 3 units.

HONORS PROGRAM

To graduate with departmental honors, a student must:

1. Complete at least 10 units of an approved (Bio. 199) research project.
2. Obtain at least a 3.0 (B) grade point average (GPA) in all Biological Sciences major requirements taken at Stanford (cognate, core, and elective courses). Grades earned from teaching (290 and 291) and research (175H and 199) are not computed into this GPA.
3. Submit an honors petition proposal to the department’s Undergraduate Research Coordinator the fifth Friday of the quarter, two quarters prior to graduation. For instance, students graduating Spring Quarter must submit petitions no later than mid-Autumn Quarter.

4. If graduating in June, participate in the Biological Sciences Honors Symposium by presenting a poster or giving an oral presentation. The symposium is at the end of May. If graduating Autumn or Winter Quarter, produce a poster.
5. Complete and submit, by the end of the quarter of graduation, two signed and bound copies of an honors thesis approved by at least two readers (one of whom must be from the faculty of the Department of Biological Sciences and both Academic Council members). In addition, students must submit two copies of the honors thesis abstract, which includes name, thesis title, sponsor, and department.

Further information on the honors program, including petition forms and examples of honors posters, theses, and proposals, is available in the Group Study Room in Falconer Library. Also, see the Web page "Research and Honors" for more information about the Honors Program, including requirements, research sponsors, and petition and thesis deadlines at http://www.stanford.edu/dept/biology/undergrad/honors/. Questions should be directed to the Undergraduate Research Coordinator, Dr. Kristin Black (kblack@stanford.edu; (650) 723-3767; Gilbert 118; office hours posted quarterly.

PREMEDICAL, PREDENTAL, AND PREPARAMEDICAL REQUIREMENTS

Premedical, preclinical, and preparamedical students who are not biology majors should take at least the following courses in Biological Sciences: 44X, 44Y, 51, 52, 53; or 41, 42, 43 and such upper-division electives as may be recommended by Stanford’s Preprofessional Advising office (Undergraduate Advising Center, Sweet Hall).

COTERMINAL B.S./M.S. DEGREE

The Department of Biological Sciences admits a limited number of undergraduate students to work for coterminal B.S. and M.S. degrees in Biological Sciences. Students must apply to the program between their eighth and eleventh quarters. They are required to submit a complete application, which includes a statement of purpose, a Stanford transcript, official GRE or MCAT scores, two letters of recommendation from faculty members in this department, and a list of courses in which they intend to enroll to fulfill degree requirements. A minimum GPA of 3.0 is necessary in all courses required for the undergraduate degree in Biological Sciences. Students must meet all requirements for both the B.S. and M.S. degrees. They must complete 15 full-time quarters (or the equivalent), or three full quarters after completing 180 units. Unit requirements for a coterminal program are 180 units for the bachelor’s degree and 45 units for the master’s degree. A more detailed description of the coterminal master’s degree program may be obtained from the Student Services Office.

GRADUATE PROGRAMS

MASTER OF SCIENCE

For information on the University’s basic requirements for the M.S. degree, see the “Graduate Degrees” section of this bulletin.

The M.S. degree program offers general or specialized study to individuals seeking biologically oriented course work, and to undergraduate science majors wishing to increase or uproot their science background or obtain advanced research experience. Students who have majored in related fields are eligible to apply, but must complete, or have completed by the time of graduation, the equivalent of a Stanford B.S. in Biological Sciences.

The M.S. program consists of Department of Biological Sciences courses or approved out-of-department electives (a list is available in the Student Services Office).

1. A minimum of 36 units must be Department of Biological Sciences courses or approved out-of-department electives (a list is available in the Student Services Office).
   a) At least 18 of these 36 units must be courses designated primarily for graduate students (generally at the 200-level or above), excluding research and teaching units.

268
b) At least 9 of the 36 units must be 3-unit or more upper-division courses from the Department of Biological Sciences, taken from three different Biology faculty members. Teaching and research units do not fulfill this requirement.

c) Up to 9 of these 36 units may be advanced-level cognate courses in chemistry, computer science, mathematics, physics, or statistics beyond the level required for the undergraduate degree.

d) Up to 18 of the 36 units may be a combination of biological research and teaching (Biology courses 175H, 198, 199, 290, 291, or 300).

2. The remaining 9 units may come from any other Stanford course work other than research or teaching.

Each candidate designs a coherent program of study in consultation with her or his department adviser. Although there are no specific courses required, program proposals must adhere to department parameters.

A Program Proposal signed by the student’s adviser, and approved by the chair of the M.S. Committee, must be filed during the first month of the first quarter of enrollment. Students may take only 6 units on a credit/no credit basis and must receive a grade of 'B-' or better in all courses taken for the degree.

To apply, students submit an application for admission to the M.S. program, two letters of recommendation, official transcripts, and official Graduate Record Examination (GRE) scores. Applicants should plan on taking the GRE at least one month prior to the application deadline to insure that the official scores are available when applications are evaluated. Applications are accepted for Autumn Quarter only; the deadline is March 15. Financial support is not available from either the department or the University for students in this program.

MASTER OF ARTS IN TEACHING

The Master of Arts, Teaching degree is offered jointly by this department and the School of Education. The degree is intended for candidates who have a teaching credential and wish to strengthen their academic preparation. The program consists of a minimum of 25 units in the teaching field and 12 units in the School of Education. Detailed requirements are outlined in the “School of Education” section of this bulletin or may be obtained from the Admissions Director, School of Education.

TEACHING CREDENTIALS

For information concerning the requirements for teaching credentials, consult the “School of Education” section of this bulletin or address an inquiry to the Credential Administrator, School of Education.

DOCTOR OF PHILOSOPHY

For information on the University’s basic requirements for the Ph.D., see the “Graduate Degrees” section of this bulletin.

Preparation for Graduate Study—Students seeking entrance to graduate study in Biological Sciences ordinarily should have the equivalent of an undergraduate major in Biological Sciences at Stanford. However, students from other disciplines, particularly the physical sciences, are also encouraged to apply. Such students are advised at the time of initial registration on how they should complete background training during the first year of graduate study. In addition to the usual basic undergraduate courses in biology, it is recommended that preparation for graduate work include courses in chemistry through organic chemistry, general physics, and mathematics through calculus.

Application, Admission, and Financial Aid—Prospective graduate students should request application information, instructions, and materials from Graduate Admissions, the Registrar’s Office. The department’s program is divided into three separate tracks: Ecology/Evolution Biology, Integrative and Organismal, and Molecular/Cell Biology. Applications to the three tracks are evaluated separately; all applicants should specify the track which interests them. The deadline for receiving applications is December 15.

Scores on the general test and the advanced biology, biochemistry, cellular and molecular biology, or chemistry test of the Graduate Record Examination (GRE) are required. Applicants should plan on taking the GRE at least one month prior to the application deadline to insure that the official scores are available when applications are evaluated.

Competition for admission to the Ph.D. program is keen and in recent years it has been possible to offer admission to only 12 percent of the applicants.

Admitted students normally are offered financial support in the form of Stanford Presidential Graduate Fellowships, biology research assistantships, NIH traineeships, or Biological Sciences fellowships.

Qualified applicants should apply for predoctoral national competitive fellowships, especially those from the National Science Foundation and the Howard Hughes Medical Institute. Applicants to the Ph.D. program should consult their financial aid officers for information and applications.

General Departmental Requirements—An admitted applicant is required to fulfill the requirements of the University as outlined in the “Graduate Degrees” section of this bulletin and the department requirements stated below.

1. Teaching experience and training are part of the graduate curriculum. Each student assists in teaching one course in the department’s core lecture (41, 42, or 43) or lab courses (44X, 44Y), a second course that can be either a core course or central menu course, and a third department course recommended to be an advanced course in the student’s area of specialization.

2. Graduate seminars devoted to the discussion of current literature and research in particular fields of biology are an important means of attaining professional perspective and competence. Seminars are presented under individual course listings or are announced by the various research groups. A department seminar meets on most Mondays at 4 p.m. Topics of current biological interest are presented by speakers from Stanford and other institutions and are announced in the weekly Stanford Report. Graduate students are expected to attend.

3. Third Year and Beyond: each student must meet with the Advising Committee beginning the third year, and each year thereafter prior to the end of the Spring Quarter. The committee signs a form to ensure compliance. During Autumn Quarter of the fourth year, candidates must meet with their committee to evaluate the project and to discuss financial support, if required, beyond the fourth year. Advanced students are encouraged to meet with their committee at least twice a year.

Academic requirements for the three tracks are as follows:

Molecular/Cell Ph.D. Track Requirements—

1. First Year:

   a) Advising Committee: shortly after arrival, each entering student meets with the First-Year Advising Committee. The committee reviews the student’s previous academic work and current goals and advises the student on a program of Stanford courses, some of which may be required and others recommended. Satisfactory completion of the Core Curriculum (below) is required of all students.

   b) Core Curriculum: all students are required to take the following courses for a letter grade, unless previous course work has fulfilled these requirements.

      Biology 203: Advanced Genetics
      Biology 214: Cell Biology of Physiological Process
      Biochemistry 201: Advanced Molecular Biology

      A fourth course is selected from the student’s area of specialization.

   c) Lab Rotations: successful completion of rotations in three different laboratories is required of all first-year students. As lab space is limited, students with a definite interest in a particular lab should make arrangements as early as possible. Written petitions for exemptions to requirements “Core Curricula” and
2. Each student must pass a two-part qualifying exam.

Third Year and Beyond:

a) Area Proposal: the area proposal is a research proposal that lies within the student’s field of expertise, but is in an area other than that of the proposed dissertation research. The written proposal must be prepared in the same detail as a grant application, including references, plans for experiments, and discussion of the interpretation of possible experimental results. The written proposal must be turned in to the chair of the Graduate Studies Committee by the end of Autumn Quarter. Before the end of Winter Quarter, the student is examined orally on the contents of the written proposal and on general knowledge in the student’s projected field of expertise, including important cognate areas. The oral examination is administered by the Dissertation Advising Committee (consisting of the advisor and three other faculty members who have agreed to serve on the committee) and one representative from the Graduate Studies Committee. (Three to five representatives from the Graduate Studies Committee are chosen to be available for these committees.)

b) Dissertation Proposal: before the end of Spring Quarter of the second year, the student must prepare a dissertation proposal that outlines the student’s projected dissertation research. An expert assessment of the current literature is expected. After submission of the proposal to the Dissertation Advising Committee, an oral examination is held. The student’s advisor is not present at the examination, which is administered by the other members of the Dissertation Advising Committee and the Graduate Committee representative.

Advancement to candidacy is contingent on satisfactory completion of both proposals and oral exams. The deadline for completion is mid-May, before the annual faculty meeting devoted to evaluation of student progress. Failure to complete these requirements on schedule results in the withholding of the graduate stipend.

3. Third Year and Beyond:

a) Dissertation and Dissertation Defense: the finished dissertation must be turned in to the student’s Reading Committee at least one month before the oral exam is planned. The Reading Committee is comprised of at least three faculty members, two of whom must be Stanford Academic Council members, and is generally comprised of members who have served on the Oral Examination Committee. At least three weeks before the oral exam, the student checks in with the committee and must incorporate any changes they require by the time of the exam. The exam cannot be formally scheduled or publicly announced until that time. Evaluation is in written form by two faculty members.

b) First-Year Paper: each student must prepare and submit a paper, before the end of Spring Quarter their first year, that is evaluated by the advising committee. This paper should be a step toward the development of a dissertation proposal and may consist of an analysis of new data or a literature review and synthesis. Evaluation is in written form by two faculty members.

2. Second Year: the student is expected to write a major dissertation proposal. The proposal is evaluated by a committee of three faculty (the Dissertation Advising Committee) in an oral presentation. This is to be completed by the end of Spring Quarter of the second year. Advancement to candidacy depends on satisfactory completion of the dissertation proposal. Failure to complete these requirements on schedule results in the withholding of the graduate stipend.

3. Third Year and Beyond:

a) Dissertation and Dissertation Defense: at least one month before the oral exam takes place, the student must submit his or her dissertation to the Dissertation Advising Committee, which then becomes the Dissertation Reading Committee. At least two weeks before the oral exam, the student must incorporate into the dissertation any changes required by the committee. The exam cannot be formally scheduled or publicly announced until that time.

Ecology/Evolution Ph.D. Track Requirements—

1. First Year: each entering student is assigned a supervisory committee of three faculty members whose function is to develop an appropriate schedule of required and recommended courses and to meet once each quarter with the student during the first year.

a) All students are required to take Bio. 306: Current Topics in Integrative and Organismal Biology. Students specializing in integrative biology may also be asked to take appropriate graduate-level courses such as Developmental Biology 210; Molecular and Cellular Physiology 215; Neurobiology 200, 216, 230; or Psychology 228.

b) First-Year Paper: each student must prepare and submit a paper, before the end of Spring Quarter their first year, that is evaluated by the advising committee. This paper should be a step toward the development of a dissertation proposal and may consist of an analysis of new data or a literature review and synthesis. Evaluation is in written form by two faculty members.
COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

Additional courses not listed here are frequently offered by selected postdoctoral or advanced Ph.D. personnel in the areas of their special research competence. They are listed in the quarterly Time Schedule, with course descriptions available in the Student Services office.

INTRODUCTORY

2. Current Research Topics in Biological Sciences—Primarily for sophomores, enrollment limited to prospective and declared Biological Sciences majors. Weekly seminars by faculty on current research in biological sciences. Molecular biology and genetics; theory and mathematics in biology; ecology, physiology, and the environment; molecular and cellular aspects of neurobiology, immunology, and developmental biology; biological chemistry; behavioral biology; evolution.

9S. Introduction to Genetics—The basic principles and concepts of genetics at the classical, molecular, and population levels. Topics: mendelian genetics, cytogenetics, gene mapping, prokaryotic genetics, DNA structure and replication, transcription and translation, mutagenesis and DNA repair, recombinant DNA technology, genomics, regulation of gene expression, and population genetics. Model organisms used in genetic research; human examples when appropriate. Emphasis is on genetic analysis, including problem-solving.

3 units, Win (Black)

STANFORD INTRODUCTORY SEMINARS

Enrollment in seminars 11 through 37 are either open primarily to freshmen or sophomores. See http://www.stanford.edu/group/introsems/ for applications or more information.

11N. Stanford Introductory Seminar: Biotechnology in Everyday Life—Preference to freshmen. The science making transgenic plants and animals possible. Current and future applications of biotechnology, and the ethical issues raised. GER:2a (DR:5)

3 units, Sum (Fowler)

12N. Stanford Introductory Seminar: The Origin of Species—Preference to freshmen. Close reading of Darwin’s Origin of Species and additional secondary sources. Focus is on the logic of Darwin’s argument (what was the best evidence for evolution at the time the book was written?). What were the weakest points and missing pieces? How does each chapter contribute to the overall argument? How was Darwin’s thinking influenced by social conditions in his day? Oral presentations and a paper required. GER:2a (DR:5)

3 units, Aut (Walbot)

13N. Stanford Introductory Seminar: Environmental Problems and Solutions—Preference to freshmen. Students do independent investigations of current environmental problems, analyzing differing views of them and discussing possible solutions. Each student gives two seminar presentations and leads two seminar discussions. Short, documented position papers are written for policy-makers. GER:2a (DR:5)

3 units, Spr (Ehrlich)

14N. Stanford Introductory Seminar: Plants and Civilization—Preference to freshmen. Lectures, readings, and discussions on the role of plants in the development of civilization. Topics: the use of forests, woodlands, and grazing lands; centers of origins and spread of crops; the development of grains and fruits; viticulture; the spice route; the use of plants as medicine; fungi in human affairs; the global spread of weeds; engineering plants for the future. GER:2a (DR:5)

3 units, Spr (Mooney)

15N. Stanford Introductory Seminar: Environmental Literacy—Preference to freshmen. Lack of public understanding of the details of most environmental problems is cited as a cause of environmental deterioration. Good citizenship requires literacy about the elements of the scientific and decision making processes that accompany most environmental issues: what can happen, what are the odds, how can the credibility of various sources of expertise for the above be assessed, what components of several examples of environmental debates deal with factual and theoretical issues, and which are the political value judgments? Student-led discussions, student peer review and revised term papers, and oral paper presentation. GER:2a (DR:5)

3 units (Schneider) alternate years, given 2001-02

16N. Stanford Introductory Seminar: Island Ecology—Preference to freshmen. Introduction and illustration of the ways that ecologists think about the world. Focus is on the Hawaiian Islands: their origin, geology, climate, the evolution and ecology of their flora and fauna, and the distribution and functioning of Hawaiian ecosystems. The reasons for the concentration of threatened and endangered species in Hawaii, the scientific basis for their protection and recovery. The ways in which knowledge of island ecosystems can contribute to ecology and conservation biology on continents. GER:2a (DR:5)

3 units, Win (Vitousek) alternate years, not given 2001-02

18N. Stanford Introductory Seminar: Plant Genetic Engineering—Preference to freshmen. Flavr-Savr tomatoes, Round-Up Ready soybeans, plastic plants. Lectures, readings, and discussions about genetically modified plants. A survey of crop modifications that have been made or are currently in development. Discussions of the scientific basis of genetic engineering in plants and its social, economic, and environmental consequences. Oral presentations and short term papers. GER:2a (DR:5)

3 units, C. Somerville, S. Somerville not given 2000-01

19N. Stanford Introductory Seminar: Sex and Gender—An Evolutionary Perspective—Preference to freshmen. Themes: the feminist literature on gender and its social construction, mathematical theory for the evolution of sexual reproduction, and case studies of gender characteristics among animals and plants. Evolutionary studies from biology contribute to the understanding of gender, a topic mostly considered in the humanities and social sciences. Readings/discussion, term paper, computer programming. GER:4c (DR:1)

3 units, Win (Roughgarden)

21N. Stanford Introductory Seminar: Infection and Immunity—Preference to freshmen. The causes and prevention of infectious diseases, focusing on the interplay between pathogens and the immune system that determines the outcome of the disease. The basic principles of microbiology, immunology, and epidemiology. Discussion of diseases of the past and present (including AIDS, TB, and malaria); the roles of geographical, societal, and biological factors in disease emergence, spread, and prevention. Primary scientific literature, student-led discussions, and written reports. Prerequisite: good biology background, AP biology or introductory college biology (41 or 42, or Human Biology 2A, 3A).

3 units, Aut (Baker) alternate years, not given 2001-02

22N. Stanford Introductory Seminar: Maintenance of the Genome—Preference to freshmen. The blueprint for life is entrusted to the DNA molecules in all living cells. Focus is on the systems that scan the cellular DNA for alterations and then make repairs to ensure genomic stability in the face of natural endogenous threats to DNA and due to radiation and chemicals in the external environment. Redundancy of the genetic message ensured by the complementary DNA strands in the double helix
facilitates the recovery of information through excision repair when one of the strands is damaged, or when incorrect base pairings or small loops of unpaired bases occur. The predisposition to cancer involves a defect in DNA repair. New mechanistic understandings and their indications have made DNA repair important for investigations in oncology, aging, developmental biology, environmental health, and neurobiology. GER:2a (DR:5)
3 units, Spr (Hanawalt)

27N. Stanford Introductory Seminar: Nature and Nurture in Brain Development—Preference to freshmen. The brain consists of billions of neurons that are precisely interconnected in circuits that ultimately underlie our ability to think, behave, and perceive the world around us. During development, these neurons are born, migrate into position, and extend axons over long distances in order to contact appropriate target cells, wiring themselves into a particular circuit. The wiring of the brain is influenced by innate, genetically-driven processes and by our life experiences. The biological mechanisms that guide the development of neuronal circuits in animal model systems and humans. The relative influences of nature and nurture on neural development. Readings from the primary scientific literature focus student discussions. Corequisite: 42.
3 units (McConnell) alternate years given 2001-02

29N. Stanford Introductory Seminar: The Outer Limits of Life—Preference to freshmen. Introduction to the diversity of microbial life, emphasizing microbes that define the biochemical limits of life and which have unique life histories. Topics: microbial evolution and early life; life at extremes of temperature, pH, salinity, radiation, and pressure; microbial life deep in the earth’s crust; life without oxygen; intimate associations between microbes and other organisms; applications of microbial diversity research in engineering, medicine, and astrobiology. Discussion, oral presentation, and short term paper. GER:2a (DR:5)
3 units, Spr (Bohanan)

37Q. Stanford Introductory Seminar: Evolution in Action—Preference to sophomores; companion course for those who are taking the Biology core. The study of natural selection: how can we find out whether evolution is occurring now in a natural population; based on a long-term study by Peter and Rosemary Grant of natural selection in the Darwin finches of the Galapagos Islands, finches which were also important to Darwin’s formulation of the idea of evolution by natural selection. Readings in a popular account of the study and research of evolution by natural selection. Student research project; field trip to the California Academy of Sciences in San Francisco to look at specimens of finches. Goal is to develop ideas about what natural selection is and how it is studied empirically by ecologists. Corequisite: 43.
3 units, Aut (Gordon)

CORE

41,42,43. Principles of Biology—Comprehensive study of the principles of modern biological sciences, taken in sequence, preferably in the sophomore year. Biology majors must take for a letter grade. Prerequisites: Chemistry 31 (or 32), 33, 35; Mathematics 19, 20, 21, or 41, 42.

41. Evolution, Genetics, Genomes and Biochemistry—Topics: the diversity of life and macroevolution; structural and molecular genetics; biochemical principles emphasizing macromolecules (proteins, lipids, carbohydrates, and nucleic acids) and how their structure relates to function and to higher order assembly; genome structure and dynamics.
5 units, Aut (Long, Simon, Simoni, Watt)

42. Molecular Cell Biology, Developmental Biology, and Neurobiology—Topics: gene expression from transcription to translation; cell structure and function; basic concepts in determination, differentiation, and morphogenesis; neurobiology from cellular and developmental to neural regulation of physiology.
5 units, Win (Cyert, Long, Luo, Sapolsky)

43. Physiology, Ecology, and Behavioral Biology—Topics: physiology; immunology; the principles underlying the exchanges of mass and energy between organisms and their environments; the organ system specializations, which utilize these principles in adapting organisms to different environments; mechanisms by which the function of each system is controlled and regulated; behavioral, population, community, and ecosystem ecology; populations, evolution, and global change.
5 units, Spr (Vitousek, Gordon, Heller, Jones, Ray)

44X, Y. Core Experimental Laboratory—Two quarters of lab projects provide a working familiarity with the concepts, organisms, and techniques of modern biological research. Emphasis is on experimental design, analysis of data, and written and oral presentation of the experiments. Lab fee. Prerequisites: Chemistry 31, 33. Recommended: Biological Sciences or Human Biology core and statistics; 44X and Y should be taken sequentially in same year. (WIM)
44X. 4 units, Win (Malladi, Yelton)
44Y. 4 units, Spr (Malladi, Yelton)

96A,B. Jasper Ridge Biological Preserve Docent Training Program—Multidisciplinary environmental education class with hands on experience and exposure to field research. The natural history of plants and animals, ecology, archaeology, geology, land management, and active research projects of the preserve are presented by experts and staff. Two-quarter preparation for Stanford and community students to join the community education program. Participants are required to lead interpretive tours as docents and participate in continuing education classes available to members of the JRBP community after preparation.
2 units, Win, Spr (Vitousek)

INTERMEDIATE UNDERGRADUATE AND GRADUATE

106Z. Man-Environment Interactions: Case Studies from Central Chile—(Enroll in Overseas Studies 106H.)
5 5 units, Aut (Hajek)

110. Vertebrate Biology—(Enroll in Human Biology 110.)
3-4 units, Spr (Porzig)

110L. Vertebrate Biology Lab—(Enroll in Human Biology 110L.)
3 units, Spr (Porzig)

112/212. Human Physiology—The functioning of organ systems, emphasizing mechanisms of control and regulation. Topics: structure and function of endocrine and central nervous systems, cardiovascular physiology, respiration, salt and water balance, exercise and gastrointestinal physiology. Lectures/discussion. Prerequisite: Biological Sciences or Human Biology core.
4 units (Heller, Harris) alternate years, given 2001-02

117. Biology and Global Change—(Same as Earth Systems 111.) The biological causes and consequences of anthropogenic and natural changes in the atmosphere, oceans, and terrestrial and freshwater ecosystems. Topics: glacial cycles and marine circulation, greenhouse gases and climate change, tropical deforestation and species extinctions, and human population growth and resource use. Prerequisites: Biological Sciences or Human Biology core or graduate standing in any department.
3 units, Win (Matson, Vitousek, Mooney)

118. Genetic Analysis of Biological Processes—Basic genetic principles and their experimental applications. Emphasis is on the identification and use of mutations to study cellular function. Prerequisite: Biology core.
5 units, Spr (Baker)

121. Biogeography—Global distributions of organisms through the Phanerozoic, with emphasis on historical causes. Topics: plate tectonics,
124. Plant Physiological Ecology: From Leaf to Globe—A functional approach to understanding terrestrial vegetation. Prerequisites: 51, 53 or 42, 43; or consent of instructor.

3 units (Mooney, Berry, Field) alternate years, given 2001-02

125. Ecosystems of California—The principles of ecosystem functions, with emphasis on the vegetation components and on California systems. Prerequisite: 51, or Human Biology 2A.

3-4 units, Spr (Mooney)

126. Cell Biology: Molecular Organization—The biochemistry and biophysics of macromolecules, emphasizing how macromolecules interact to form complex cellular structures. Topics: protein biosynthesis and folding, structure assembly and functions of biological membranes, and mechanisms of membrane trafficking. Experimental logic and critical interpretation of experimental data. Prerequisite: Biological Sciences core.

4 units, Win (Kopito, Frydman)

127. Cell Biology: Cellular Dynamics—The principles of eukaryotic cellular function, emphasizing how cellular structures carry out important cell processes. Topics: cell cycle, mitosis, cytoskeleton and cell motility, cell-cell interactions, and signal transduction. Experimental logic and interpretation of experimental results. Prerequisite: Biological Sciences core.

4 units, Spr (Stearns, Nelson)

128. Algae/Fungi—Introduction to these groups, their utilization in molecular biology in studying biological problems, and their ecological significance. Lectures, lab, field trips. Prerequisite: Biological Sciences core or consent of instructor.

4 units (Grossman) alternate years, given 2001-02

129. Developmental Genetics—The uses of the tools of modern genetics to understand outstanding questions in developmental biology.

3 units (Baker) alternate years, given 2001-02

130. Genetics of Prokaryotes—Analysis of prokaryotic genes and genomes with emphasis on the evolution of genetic systems. Prerequisite: 41 or 52.

3 units, Aut (Campbell)

131. Replication of DNA—Modes of DNA replication and their control in prokaryotic and eukaryotic systems. Emphasis is on experimental approaches and their limitations. Critical review of current literature in seminar format. Lectures and student reports on specialized topics. Enrollment limited to 14 advanced undergraduates. Prerequisites: 41 or 52 and/or consent of instructor.

3 units (Hanawalt) not given 2000-01

132. Evolutionary Paleobiology—A paleontological approach to evolutionary theory. Topics: history of life, speciation, heterochrony, evolutionary constraint, coevolution, macroevolution, the Cambrian Explosion, mass extinctions, taphonomy, life on land, life in the sea, life in the air.

4 units, Win (Hadly)

133. Plant Genetics—Gene analysis, mutagenesis, and transposable elements; developmental genetics of flowering and embryo development; biochemical genetics of plant metabolism; lessons from transgenic plant studies. Prerequisites: 41,42,43 or 51,52,52, or consent of the instructor.

3 units (Walbot) alternate years, given 2001-02

134. Ecology and Evolution of Plants—Introduction to the basic principles of ecology and evolutionary biology, focusing on plants. Topics: plants in the environment, population dynamics, natural selection in plant populations, the origin and maintenance of diversity, speciation, extinction, conservation of plant populations. Limited enrollment, lab with field trips and independent projects. Prerequisite: 43 or 51, or consent of the instructor. Recommended: statistics.

3-5 units (Ackerly) alternate years, given 2001-02

135. Biology of Birds—the ways birds interact with their environments and each other, emphasizing studies that had impact in the fields of population biology, community ecology, and evolution. Students become familiar with local bird communities; emphasis is on field research. One one-hour lecture and one three to five hour lecture or field trip per week. Enrollment limited to 20. Prerequisites: 43 or 51 or equivalent, and consent of instructor. Recommended: birding experience.

3 units (Ehrlich) alternate years, given 2001-02

136. Principles of Ecology—(Graduate students register for 242; same as Geophysics 142.) Introduction to ecology, emphasizing ecological theory and the population and community scales of organization, using primarily zoological examples. Evolutionary processes in ecology. Prerequisites: first-year calculus (Mathematics 19-21 or higher). Recommended: 43 or 51.

4-5 units, Win (Feldman)

137. Controlling Climate Change in the 21st Century—(Same as Human Biology 147.) The science, economics, and environmental diplomacy of global climate change. Topics: the science of climate change, climate change and global environmental law; global economic approaches to carbon abatement, taxes, and tradable permits; joint implementation, consensus, and division in the European Union; gaining the support of China, other developing countries, and U.S. corporations; alternative energy and energy efficiencies for less carbon-intensive electric power and transport. Enrollment limited to 12 seniors.

3 units, Aut (Schneider, Rosencranz)
148. Colloquium on Biosystematics and Evolution—Panel discussion and outside speakers cover diverse topics of current interest in the systematics and evolution of living diversity; sponsored jointly with the California Academy of Sciences.

1 unit, Win (Wait) alternate years, not given 2001-02

150/250. Human Behavioral Biology—(Graduate students register for 250.) The biological basis of normal and abnormal human behavior is examined to train students in approaching complex behaviors in a multidisciplinary way. Relevant disparate disciplines (sociobiology, ethology, neuroscience, and endocrinology) are integrated in the examination of behaviors such as aggression, sexual behavior, language use, mental illness.

6 units (Sapolsky) alternate years; given 2001-02

151. Mechanisms of Neuron Death—Open to Biology majors with a strong background in neuroscience. Seminar on the cell and molecular biology of neuron death during neurological disease. Topics: the amyloid diseases (Alzheimer's), prion diseases (kuru and Creutzfeld-Jacob), oxygen radical diseases (Parkinson's and ALS), triplet repeat diseases (Huntington's), and AIDS-related dementia. Lectures, discussions, and student presentations. Enrollment limited to 16.

3 units (Sapolsky)

153. Cellular Neuroscience: Cell Signaling and Behavior—(Enroll in Psychology 120.)

4 units, Aut (Wine)

154/254. Molecular and Cellular Neurobiology—(Graduate students register for 254; same as Neurobiology 254.) Lecture/seminar for advanced undergraduates and graduate students, focusing on cellular and molecular mechanisms in the organization and functions of the nervous system. Topics: cell biology of the neuron, wiring of the neuronal network, synapse structure and synaptic transmission, signal transduction in the nervous system, molecular basis of behavior including learning and memory, molecular pathogenesis of neurological diseases. Prerequisite for undergraduates: Biological Sciences core or equivalent, plus at least one of 118, 128, 129, or 153, or consent of the instructors. 4 units, Aut (Luo, Schulman)

158. Developmental Neurobiology—Lecture/seminar for advanced undergraduates and coterminus master's students. The principles of nervous system development from the molecular control of patterning, cell-cell interactions, and trophic factors to the level of neural systems and the role of experience in influencing brain structure and function. Topics: neural induction and patterning cell lineage, neurogenesis, neuronal migration, axonal pathfinding, synapse elimination, the role of activity, critical periods, and the development of behavior. Enrollment limited to 75. Prerequisites: 42 or 53 or equivalent; and 153 or Neurobiology 200, or consent of instructor.

4 units, Spr (McConnell) alternate years, not given 2001-02

184/284. Principles and Practice of Biosystematics—The basic principles and major operating procedures of systematic biology; the study of the classification of organisms and of the relationships among them. Concepts and issues common to the study of all organisms; examples from particular groups of creatures.

4 units, Spr (Watt, Gosliner, Jablonski, Ackerly) alternate years, not given 2001-02

HOPKINS MARINE STATION

Note that several of these courses can be used to fulfill department menu requirements and that completion of the Biological Sciences core is a prerequisite for all of these courses. For course descriptions, see the "Hopkins Marine Station" section of this bulletin.

56H. Seminar: History and Philosophy of Science

2 units (Somero) alternate years, given 2001-02
UNIVERSITY, INVOLVING INDIVIDUAL WORK

Students majoring in Biological Sciences are encouraged to pursue directed reading and research opportunities. An introduction to research is provided by Bio. 2.

191. Research in Bird Biology—Semi-independent field research in ornithology, emphasizing ecological relationships. Projects involve research, planned and carried out by the student in consultation with the instructor. Results are written in publication format. Enrollment limited. Prerequisites: 43 or 51, concurrent or subsequent enrollment in 139, and consent of instructor.

3 units, Win, Spr (Ehrlich)


1 unit, Aut, Win, Spr (Black)

194/294. Seminar in Environmental Policy Research—Principles of and current problems in environmental policy. Lectures, student presentations, and intensive library research or participation in group research project required. May be repeated for credit. Prerequisite: consent of instructor.

3 units (Ehrlich) alternate years, given 2001-02

198. Directed Instruction/Reading—May be taken as a prelude to research. Read/discuss biology-related literature with a faculty sponsor, possible participation in a lab or research group seminars, and library research. Credit for work arranged with out-of-department instructors is restricted to Biological Sciences majors and requires department approval. See http://www.stanford.edu/dept/biology/undergrad/honors/Research and Honors under “Research Courses” for information on research sponsors, units, petition instructions, deadlines, credit for summer research, and out-of-Stanford research, or email kblack@leland for more information.

198H. Directed Instruction/Reading—For work done under supervision of Hopkins Marine Station faculty.

199. Undergraduate Research—Individual research taken by arrangement with in-department or out-of-department instructors. Credit for work arranged with out-of-department instructors is restricted to Biological Sciences majors and requires department approval. See http://www.stanford.edu/dept/biology/undergrad/honors/Research and Honors under “Research Courses” for information on research sponsors, units, petition instructions, deadlines, credit for summer research, and out-of-Stanford research, or email kblack@leland for more information.

199H. Undergraduate Research—For undergraduate research done under supervision of Hopkins Marine Station faculty.

ADVANCED UNDERGRADUATE AND GRADUATE

203. Advanced Genetics—(Same as Genetics 203.) Explores the genetic toolbox. Examples of analytic methods and modern synthetic genetic manipulation, including original papers. Emphasis is on use of genetic tools in dissecting complex biological pathways, developmental processes, and regulatory systems. Graduate students in biological sciences welcome; those with minimal experience in genetics should prepare themselves by working out problems in Suzuki, et al, or Hartl, et al.

4 units, Aut (Botstein, Kim, Stearns, Villeneuve, Sidow)

205. DNA Repair and Mutagenesis—Interactions of endogenous and environmental mutagens with DNA. Responses of living systems to damaged DNA, including molecular mechanisms for DNA repair and recombinational modes. Inducible repair responses and “error-prone” mechanisms. Human hereditary deficiencies in DNA repair that predispose to cancer. The relationships of DNA repair to mutagenesis and carcinogenesis. Lectures/discussion of selected topics and review of current research literature. Prerequisites: 41 or 52, 118, and/or consent of instructor.

3 units, Win (Hanawalt)

207. The Life and Death of Proteins—How proteins are made and degraded in the cell. Critical reading/discussion of primary literature. Selected “case studies” follow the evolution of scientific ideas, and evaluate how different experimental approaches can contribute to our understanding of a biological problem. Topics: protein folding and assembly, mechanisms of chaperone action, sorting into organelles and the ubiquitin-proteasome pathway. Enrollment limited to 20.

3 units (Frydman) alternate years, given 2001-02

208. Developmental Biology—(Enroll in Developmental Biology 210.)

5 units, Spr (Fuller, Crabtree, Stuart Kimm, Kingsley, Nusslein-Volhard, Scott, Seung Kim, Tauber)

209. Advanced Neurosciences Laboratory—The use of equipment and techniques required to record and analyze extracellular and intracellular activity in vertebrates, or other state-of-the-art neuroscience techniques. In-depth training in a subset of these techniques as applied to a specific research project. Students present/critically evaluate representative neuroscience methodologies in weekly discussion groups. Enrollment limited to 10; admission by application (available in Student Services office). Prerequisites: Biological Sciences or Human Biology core sequence and core lab (44 or equivalent). Recommended: some advanced course work in neurobiology.

4 units, Win (Heller, Grahn)

211. Biophysics of Sensory Transduction—The diverse mechanisms, neural and aural, that organisms have evolved to detect physical cues from the environment. Sensory topics: vision, hearing, taste, olfaction, chemoreception, mechanoreception, electromagnetic sensing, and other modalities. Emphasis is on common and/or emergent biophysical themes, e.g., sensitivity, amplification, encoding, adaptation, and the molecular basis of cellular signaling. Lectures and student-led presentations cover interdisciplinary aspects of biology and physics. Prerequisites: familiarity with undergraduate physics (with calculus) and basic biology.

4 units, Win (Heller, Grahn)

213. Viruses—Principles of virus growth, genetics, architecture, and assembly. The relation of temperate viruses and other episomes to the host cell. Prerequisite: 41 or 52. Recommended: 118.

3 units, Win (Campbell)

214. Cell Biology of Physiological Processes—(Same as Molecular and Cellular Physiology 221.) The basic mechanisms of membrane and cellular biogenesis in relation to physiological processes. Emphasis is on the regulatory and signaling mechanisms involved in coordinating complex cellular phenomena, such as cellular organization, function, and differentiation. Topics: cellular compartmentalization, transport and trafficking of macromolecules, organelle biogenesis, cell division, motility and adhesion, and multicellularity. Must be taken concurrently with 214A-H. Prerequisites: Biological Sciences core, Biochemistry 201.

4 units, Win (Rexach, Nelson, Frydman, Jackson, Theriot, Fang)

214A, B, C, D, E, F, G, H. Cell Biology of Physiological Processes—(Same as Molecular and Cellular Physiology 221A-H.) Required course taken with 211, taught by medical school faculty. Meant to expand on the topics covered in 214. Students must register for only one section. Prerequisites: Biological Sciences core, Biochemistry 201.

2 units, Win (Staff)

215. Biochemical Evolution—Lectures/discussion covering the biochemical viewpoints on diverse aspects of the evolutionary process. Topics: prebiotic biochemistry and the origins of life; adaptive organiza-
tional lectures that meet jointly with 158. See 158.

216. Ecosystem Ecology and Global Biogeochemistry—Nutrient cycling and the regulation of primary and secondary production in terrestrial, freshwater, and marine ecosystems; land-water and biosphere-atmosphere interactions; global element cycles and their regulation; human effects on biogeochemical cycles. Prerequisite: graduate standing in science or engineering; consent for undergraduates or coterminal students.

3 units, Spr (Vitousek) alternate years, not given 2001-02

217. Climate Theory, Modeling, Applications, and Implications—The history of the coevolution of climate and life. Theories of climate, external and internal climatic forcings, definitions of climate and the climate system, and the rationale for climatic modeling. Hierarchy of climatic models; interactions among atmosphere, biosphere, oceans, hydrosphere, and cryosphere. Climatic predictability; implications of predictions and relevance to current controversies. Prerequisites: Biological Sciences core or Civil and Environmental Engineering 163, and math through differential equations, or consent of instructor.

3 units (Schneider) alternate years, given 2001-02

220. Ecology of Microorganisms—Interactions between microorganisms and their environments from an ecological and evolutionary perspective. Topics: nutrient acquisition and environmental sensing, behavioral ecology, growth of cells and populations, population interactions, communities, microbial biodiversity. Prerequisites: Biological Sciences core or equivalent, or consent of instructor. Recommended: 133, 142.

3 units, Win (Bohannan)

230. Molecular and Cellular Immunology—For graduate students and advanced undergraduates. The basic components of the immune system: structure and functions of antibody molecules; cellular basis of immunity and its regulation; molecular biology and biochemistry of antigen recognition structures and signaling pathways; genetics of immunity and disease susceptibility. Emphasis is on key experimental approaches that have advanced our understanding. Prerequisites for undergraduates: Biological Sciences or a Human Biology core, or consent of instructor.

4 units, Aut (Jones)

237. Introduction to Biotechnology—(Enroll in Chemical Engineering 450.)

3 units, Spr (Robertson, Swartz)

249. Neural Basis of Sleep and Circadian Rhythms—How the activity of the brain is affected by changes in the sleep/wake state. The neurochemistry of changes in brain activity and conscious awareness associated with changes in the sleep/wake state. Behavioral and neurobiological phenomena of sleep homeostasis, REM-sleep regulation, circadian rhythms, hibernation, and anesthesia. Enrollment limited to 30. Prerequisite: basic understanding of the nervous system (at least one of 42 or 53, Human Biology 4A, Psychology 70, or consent of instructor).

4 units, Aut (Heller, Edgar) alternate years, not given 2001-02

256. Plant Physiology—The physiological functions of land plants from analytical and quantitative points of view: photosynthetic energy and gas exchange; water and photosynthetic long-distance transport; mineral nutrient ion uptake and transport; growth at cellular and organismal levels, and its hormonal regulation; responses to light, gravity, temperature, etc. Prerequisite: Biological Sciences core.

4 units, Win (Ray)

258. Neural Development—Seminar for graduate students, with optional lectures that meet jointly with 158. See 158.

4 units, Spr (McConnell) alternate years, not given 2001-02

274A. Environmental Microbiology I—(Enroll in Civil and Environmental Engineering 274A.)

3 units, Aut (Spormann)

274B. Environmental Microbiology II—(Enroll in Civil and Environmental Engineering 274B.)

3 units, Win (Spormann)

274C. Environmental Microbiology Laboratory—(Enroll in Civil and Environmental Engineering 274C.)

3 units, Spr (Spormann)

283. Theoretical Population Genetics—Detailed survey of models in population genetics. Selection, random drift, gene linkage, migration, and inbreeding, and the influence they have on the evolution of gene frequencies and chromosome structure. Models are related to DNA sequence evolution. Prerequisite: consent of instructor.

3 units, Aut (Feldman)

290. Teaching of Biological Science—Open to upper-division undergraduates and graduate students. Practical experience in teaching lab biology or serving as an assistant in a lecture course. Prerequisite: consent of instructor.

1-5 units, Aut, Win, Spr (Staff)

291. Development and Teaching of Core Experimental Laboratories—Preparation for teaching the core experimental courses (44X and 44Y). Emphasis is on lab, speaking, and writing skills. Focus is on updating the lab to meet the changing technical needs of the students. Must be taken prior to teaching either of the above courses. Prerequisite: selection by instructor.

2 units, Aut, Win (Mailardi, Yelton)

PRIMARY FOR GRADUATE STUDENTS

300. Research—For graduate students only. Individual research taken by arrangement with in-department or out-of-department instructors. Master's students: credit for work arranged with out-of-department instructors is restricted to Biological Sciences students and requires an approved department petition. See http://www.stanford.edu/dept/biology/undergrad/honors/, Research and Honors under "Research Courses" for information on research sponsors, units, petition instructions, deadlines, credit for summer research, and out-of-Stanford research, or email kblack@leland for more information.

300H. Research—For graduate research done under supervision of Hopkins Marine Station faculty.

301. Current Topics in Molecular, Cell, Developmental, Genetics, and Integration Biology—Enrollment limited to Biological Sciences Ph.D. students in the first year of graduate study. Lectures in areas of the faculty's current research interests.

1 unit, Aut (Staff)

302, 303, 304. Current Topics in Ecology and Evolution—Required of first-year graduate students in population biology and open to all graduate students. Discussion of the major conceptual issues and developing topics in population biology.

302. 1 unit, Aut (Bohannan)

303. 1 unit, Win (Bohannan)

304. 1 unit, Spr (Bohannan)

303. Concepts in Ecology and Evolution—Required of first-year graduate students in population biology and open to all graduate students. Discussion of the major conceptual issues and developing topics in population biology.

1 unit, Win (Bohannan)

304. Concepts in Ecology and Evolution—Required of first-year graduate students in population biology and open to all graduate students.
Discussion of the major conceptual issues and developing topics in population biology.

1 unit, Spr (Bohannan)

305. Seminar on DNA Repair and Genetic Toxicology—Enrollment limited to graduate students and advanced undergraduate students doing research in this field. Literature review and discussion of current research, emphasizing experimental approaches for studying DNA damage processing in bacteria, yeast, and mammalian cells. Prerequisite: consent of instructor.

1-3 units, Aut, Win, Spr (Hanawalt)

306. Current Topics in Integrative Organismal Biology—Enrollment limited to graduate students doing research in this field.

1 unit, Aut (Staff)

307. Seminar in Microbial Ecology and Evolution—Discussion of recent and classical research papers in microbial ecology and evolution, and presentation of research in progress by participants. Prerequisite: consent of instructor.

1 unit, Aut, Win, Spr (Bohannan)

315. Seminar in Biochemical Evolution—Literature review and discussion of current topics in biochemical evolution and molecular evolutionary genetics. Prerequisite: consent of instructor.

1-3 units, qtr. by arrangement (Watt)

333. Seminar in Evolutionary Ecology—Literature review and research discussion on a selected topic in ecology and evolution. Student participation required. Prerequisite: consent of instructor.

1-3 units, Spr (Ackerly) alternate years, not given 2001-02


3 units, Spr (Mooney, Berry, Field)

alternate years, not given 2001-02

342. Plant Biology Seminar—Topics announced at the beginning of each quarter. In-depth coverage of the current literature.

1 unit, Spr (Walbot, Berry, Bjorkman, Briggs, Grossman, Hoffman, Long, Mooney, Ray, Vitousek)

346. Advanced Seminar in Molecular Microbiology—Enrollment limited to graduate students directly associated with departmental research groups in genetics or molecular biology.

1-3 units, Aut, Win, Spr (Long, Campbell, Spormann, Grossman, Yanofsky)

383. Seminar in Population Genetics—Literature review and research discussion of current problems in the theory and practice of population genetics and molecular evolution. Student participation required. Prerequisite: consent of instructor.

1-3 units, Aut, Win, Spr (Feldman)

384. Seminar in Theoretical Ecology—(Same as Geophysics 185Y.) Discussions of recent and classical research papers in ecology, and presentation of work in progress by participants. Prerequisite: consent of instructor.

1-3 units, Spr (Roughgarden)

459. Frontiers in Interdisciplinary Biosciences—(Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible.) Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford's Clark Center for interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

2 units, Aut, Win, Spr (S. Block)

DIVISION OF MARINE BIOLOGY
HOPKINS MARINE STATION

Emeritus: (Professor) John H. Phillips, Jr.; (Professor-Research) R. Paul Levine
Acting Director: George N. Somero
Professors: Mark W. Denny, David Epel, William F. Gilly, Dennis A. Powers, George N. Somero, Stuart H. Thompson
Associate Professor: Barbara A. Block
Assistant Professor: Fiorella Micheli
Lecturer: James M. Watanabe

The Hopkins Marine Station is at Pacific Grove, on the south side of Monterey Bay, 90 miles from the main University campus. The 11-acre grounds, on the main portion of Cabrillo Point, include a sheltered landing place and storage for small boats. Buildings include the Lawrence Blinks Laboratory, Alexander Agassiz Laboratory, Jacques Loeb Laboratory, Harold A. Miller Library, Monterey Boat Works, Walter K. Fisher Laboratory, Tuna Research and Conservation Center, and DeNault Family Research Building. The 15,000 volume library subscribes to approximately 450 journals, and its collections are particularly strong in embryology, marine biology, microbiology, and oceanography.

The station is open during the entire year and maintains a permanent staff of resident investigators and technical assistants. The staff is supplemented by visiting faculty members, especially during the summer. There are facilities for visiting investigators and for elementary and advanced instruction in biology. For further information, write Hopkins Marine Station, Pacific Grove, CA 93950.

COURSES

56H. Seminar: History and Philosophy of Science—The nature of scientific inquiry, its logic, historical patterns, and sociology. Emphasis is on the unique aspects of the biological sciences.

2 units (Somero) alternate years, given 2001-02

160H/260H. Comparative Animal Physiology—(Graduate students register for 260H.)

The structures and processes that control life at the cellular level. Topics: membrane structure and function, signal transduction, the cytoskeleton, transport processes, cell division, cell-cell interactions, and motility. Similar to Bio. 121 but using marine examples. Prerequisite: Biological Sciences core or consent of instructor.

4 units, Win (Epel)

161H/261H. Invertebrate Zoology—(Graduate students register for 261H.)

Survey of invertebrate diversity emphasizing form and function in a phylogenetic framework. Morphological diversity, life histories, physiology, and ecology of the major invertebrate groups, concentrating on local marine form examples. Current views on the phylogenetic relationships and evolution of the invertebrates. Lectures, lab, plus field trips. Prerequisite: Biological Sciences core or consent of instructor.

5 units, Win (Watanabe)

162H/262H. Comparative Animal Physiology—(Graduate students register for 262H.)

Physiological principles are examined using the diversity of solutions apparent in vertebrates and invertebrates, and focusing on how animals work. Topics: physiology of respiration, circulation, energy metabolism, thermoregulation, osmotic regulation,
muscle physiology, and locomotion. Labs introduce physiological measurements with animals, discussion sections emphasize current topics in evolutionary and ecological physiology. Prerequisite: Biological Sciences core.

5 units, Spr (Block) alternate years, not given 2001-02

163H/263H. Principles of Oceanic Biology—(Graduate students register for 263H.) How the physics and chemistry of the oceanic environment affect marine plants and animals. Topics: seawater and ocean circulation, separation of light and nutrients in the two-layered ocean, oceanic food webs and trophic interactions, oceanic ecosystems, biogeography, and global change. Lectures, discussion, and field trips. Recommended: Physics 21 or 51, Chemistry 31, Biological Sciences core, or consent of instructor.

4 units, Win (Somoero)

164H/264H. Marine Botany—(Graduate students register for 264H.) Introduction to plants in the sea. Phytoplankton and oceanic productivity; macrophytes and nearshore ecology; marine angiosperms from taxonomical, physiological, and ecological perspectives. Lectures, lab. Prerequisite: Biological Sciences core or consent of instructor.

4 units, Win (Staff) alternate years, not given 2001-02

165H/265H. Air and Water—(Graduate students register for 265H.) Introduction to environmental physics. The physical properties of life’s fluids compared and contrasted. How and why life has evolved differently on land than in water. Topics: density, viscosity, diffusion, thermal properties, sound, light, evaporation, and surface tension. Recommended: Physics 21, 23, or 51, 53; calculus; Biological Sciences core; or consent of instructor.

3 units, Spr (Denny) alternate years, not given 2001-02

166H/266H. Locomotion—(Graduate students register for 266H.) How animals and plants swim, crawl, run, and fly. The principles of fluid and solid mechanics determine the possibilities and limitations of organismal motion. Recommended: Physics 21 or 51, Biological Sciences core, or consent of instructor.

3 units (Denny) alternate years, given 2001-02

167H/267H. Nerve, Muscle, and Synapse—(Graduate students register for 267H.) Fundamental aspects of membrane excitability and conduction, synaptic transmission, and excitation-contraction coupling. Emphasis is on biophysical, molecular, and cellular level analyses of these processes in vertebrate and invertebrate systems. Labs on intra- and extracellular recording and patch clamp techniques. Lectures, discussions, and labs. Prerequisites: Physics 23, 28, 43, or equivalent; Chemistry 31, 135; calculus; or consent of instructor.

5 units, Win (Gilly)

168H/268H. Seminar: Cellular Signal Transduction—(Graduate students register for 268H.) Lecture/seminar, group discussions. Focus is on the physiology, biochemistry, and molecular biology of signaling cascades, from basic principles to advanced and current topics. Prerequisite: consent of instructor. (AU)

1 unit, Spr (Thompson)

169H/269H. Neurobiology and Behavior—(Graduate students register for 269H.) The neural mechanism responsible for generating animal behavior. Topics: neural excitability, synaptic plasticity, signal transduction, and neural circuits. Lectures, discussions, demonstrations, and lab. Prerequisite: Biological Sciences core or consent of instructor.

5 units, Win (Thompson)

170H/270H. Seminar: Topics in Marine Biology—(Graduate students register for 270H.) A specific topic of current interest to marine science is explored through discussion of the primary literature. Prerequisite: Biological Sciences core or consent of instructor.

1 unit, Win (Staff)

171H/271H. Ecological and Evolutionary Physiology—(Graduate students register for 271H.) The interplay between environmental factors (e.g., temperature, light, nutrient supply, salinity, and oxygen availability) and adaptive change at the physiological level. Emphasis is on marine species and the roles played by physiological adaptations in establishing their distribution and performance. Prerequisite: Biological Sciences core or consent of instructor.

4 units, Win (Somoero)

172H/272H. Marine Ecology—(Graduate students register for 272H.) Introduction to the principles of ecology as applied to life in the sea. Population dynamics, community ecology, and the effects of man on the oceans. Lectures, lab. Prerequisite: Biological Sciences core or consent of instructor.

5 units, Spr (Micheli)

173H/273H. Marine Conservation Biology—(Graduate students register for 273H.) Offered with the support of the Pew Conservation Trust. The science of preserving marine diversity and the major conservation issues associated with marine ecosystems. Topics: the decline of open fisheries, salmon conservation, bycatch issues in fisheries, the use of marine reserves, marine invasions and pollution, and global warming. Guest lecturers from other universities who specialize in marine conservation.

3 units (Block) alternate years, given 2001-02

174H/274H. Experimental Design and Probability—(Graduate students register for 274H.) Variability is an integral part of biology. Introduction to probability and its use in designing experiments to address biological problems. Focus is on analysis of variance, when and how to use it, why it works, and how to interpret the results. Design of complex, but practical, asymmetrical experiments and environmental impact studies, and regression and analysis of covariance. Computer-based data analysis. Prerequisite: Biological Sciences core or consent of instructor.

3 units, Spr (Watanabe)

175H. Problems in Marine Ecology and Ecophysiology—Field-based, emphasizing individual and small-group research for advanced undergraduates. Students learn field and laboratory techniques to address ecological, ecophysiological, and biomechanical problems faced by marine organisms. Original research projects may be integrated with ongoing research programs in the Hopkins Marine Life Refuge. Prerequisites: Biological Sciences core, consent of instructors.

8 units, Spr (Watanabe, Denny, Micheli, Somoero, Epel, Block)

176H. Experimental Neurobiology—Lab, emphasizing methods in the neurosciences, including electrophysiological, biochemical, molecular, behavioral, and histological techniques. Students work on individual original research projects under guidance of the faculty. Prerequisites: strong interest in neurobiology and previous relevant course work, consent of instructors.

8 units, Spr (Gilly, Thompson)

177H/277H. Seminar: Cell Physiology of Stress—(Graduate students register for 277H.) Organisms are constantly exposed to environmental stresses and potential cell damage. The nature of these stresses, adaptive defense mechanisms, and repair responses when these defenses break down. Emphasis is on stress responses to toxins, DNA damage, oxidative stress, and the signal transduction pathways involved in stress responses. Prerequisites: Biological Sciences core, consent of instructor.

2 units, Spr (Epel) alternate years, not given 2001-02

178H/278H. Seminar: Deep-Sea Biology—(Graduate students register for 278H.) The deep sea is the largest, but least understood, fraction of the biosphere. Organisms living in this huge space possess diverse adaptations to allow life under high pressure. Recent discoveries in deep-sea biology, including the biology of the hydrothermal vents, and the
technology that makes these advances possible. Prerequisites: Biological Sciences core, consent of instructor.

2 units, Spr (Somero) alternate years, not given 2001-02

198H. Directed Instruction/Reading—May be taken as a prelude to research and may also involve participation in a lab or research group seminar and/or library research. Credit for work arranged with out-of-department instructors restricted to Biological Sciences majors and requires department approval.

Aut, Win, Spr, Sum—both terms (Staff)

199H. Undergraduate Research—For experience in biological research, qualified undergraduate students may undertake individual work in the fields listed under 300H. Arrangements must be made by consultation or correspondence.

Aut, Win, Spr, Sum—both terms (Staff)

290H. Teaching of Biological Science—Open to upper-division undergraduates and graduate students. Practical experience in teaching lab biology or serving as an assistant in a lecture course. Prerequisite: consent of instructor.

1-5 units, Win, Spr, Sum (Staff)

300H. Research—Graduate study involving original work may be undertaken with members of the staff in the fields indicated:

B. Block: Comparative Vertebrate Physiology—biomechanics, metabolic physiology and phylogeny of pelagic fishes, evolution of echolocation.

M. Denny: Biomechanics—the mechanical properties of biological materials and their consequences for animal size, shape, and performance.


W. Gilly: Neurobiology—analysis of giant axon systems in marine invertebrates from molecular to behavioral levels.

R. P. Levine: Molecular Biology and Biochemistry of Biomineralization.

P. Micheli: Marine Ecology—ecosystems interactions and community ecology, scale-dependent aspects of community organization, marine conservation and design of multi-species marine protected areas, behavioral ecology.


G. Somero: Ecological and Evolutionary Physiology—adaptations of marine organisms to the environment: temperature, pressure, desiccation, and oxygen availability.

S. Thompson: Neurophysiology—neuronal control of behavior and mechanisms of ion permeation, signal transduction, calcium homeostasis, and neurotransmission.

J. Watanabe: Marine Ecology—kelp forest ecology and invertebrate zoology.

SUMMER PROGRAM

The summer program is open to all advanced undergraduate, graduate, and postdoctoral students, and to teachers whose biological backgrounds, teaching, or research activities can benefit from a summer’s study of marine life. Application blanks and further information may be obtained by writing to Hopkins Marine Station, Pacific Grove, CA 93950. Completed applications should be submitted by March 31. Applications received later are considered if space is still available.

The Summer Quarter is divided into two terms. It is possible to register for either term, or for the full quarter. Registration is possible for only one course during each term.

FIRST TERM

179H. Subtidal Communities—Lectures, lab, and field trips treating shallow water marine communities. Emphasis is on local habitats and the introduction of physical environmental parameters, community composition, aspects of the biology of constituent species, and methods for subtidal studies. Prerequisites: SCUBA certification, SCUBA equipment, ocean diving experience, and some background in biology.

6 units (Watanabe)

277H. Biomechanics and Ecological Physiology of Intertidal Communities—Introduction to the mechanical and physiological design of wave-swept organisms. How different abiotic stresses (wave exposure, wind speed, temperature, light) influence marine animals and plants, and adaptive responses to these stresses. Lab introduces methods for measuring environmental stress and organismal responses. Recommended: background in algology, intertidal ecology, or invertebrate zoology; basic physics and calculus.

4 units (Denny, Somero) alternate years, not given 2001-02

SECOND TERM

180H/280H. Problems in Subtidal Ecology—Graduate students register for 280H. Group and individual research projects focus on shallow water marine communities, emphasizing the importance of identifying a relevant problem through review of the scientific literature, formulating an adequate research plan, and collecting data in the field. Lectures/discussions focus on proper experimental design, data analysis, and critiques of selected papers from the scientific literature. Prerequisites: 179H or consent of instructor; SCUBA certification, SCUBA equipment, and ocean diving experience.

6 units (Watanabe)

BIOPHYSICS PROGRAM

Chair: William Weis

Professors: Richard W. Aldrich (Molecular and Cellular Physiology), Steve Block (Applied Physics), Steven Boxer (Chemistry), Martin J. Brown (Radiation Oncology), Steven Chu (Applied Physics), Sebastian Doniach (Applied Physics), Philip C. Hanawalt (Biological Sciences), Keith O. Hodgson (Chemistry), Wray H. Huestis (Chemistry), Oleg Jardetzky (Molecular Pharmacology), Eric Kool (Chemistry), Ron Kopito (Biological Sciences), Roger D. Kornberg (Structural Biology), Michael Levitt (Structural Biology), Harden M. McConnell (Chemistry), David B. McKay (Structural Biology), W. E. Moerner (Chemistry), Norbert Pelc (Radiology), Ed Solomon (Chemistry), James A. Spudich (Biochemistry, Developmental Biology), Howard Schulman (Neurobiology)

Associate Professors: Gilbert Chu (Oncology), Amato Giaccia (Radiation Oncology), David Heeger (Psychology), Daniel Herschlag (Biochemistry), Jody Puglisi (Structural Biology), William Weis (Structural Biology), Tobias Meyer (Molecular Pharmacology)

Assistant Professors: Judith Frydman (Biological Sciences), Kenan C. Garcia (Microbiology and Immunology), Peter Jackson (Pathology), Peter Kuhn (SLAC), Vijay Pande (Chemistry), Julie Theriot (Biochemistry)

The Biophysics Program offers instruction and research opportunities leading to the Ph.D. in Biophysics. Students admitted to the program may perform their graduate research in any appropriate department.

GRADUATE PROGRAM

For information of the University’s basic requirements for the Ph.D. degree, see the “Graduate Degrees” section of this bulletin.

A small number of highly qualified applicants are admitted to the program each year. Applicants should present strong undergraduate backgrounds in the physical sciences and mathematics. The graduate course program, beyond the stated requirements, is worked out for each student individually with the help of appropriate advisers from the Committee on Biophysics. The requirements and recommendations for the Ph.D. degree include:
1. Training in physics or chemistry equivalent to that of an undergraduate physics or chemistry major at Stanford.
2. Completion of the following courses (or their equivalents):
   a) Biophysics 250
   b) Biochemistry 200, 201
   c) Chemistry 131, 171, 173, and 175
   d) Structural Biology 241 and 242
   e) Additional courses as required for the individually tailored program
3. Proficiency in one or more foreign languages and/or a computer language may be required at the discretion of the major professor.
4. Opportunities for teaching are available during the first nine quarters, at the discretion of the advising committee.
5. The student must prepare a Dissertation Proposal defining the research to be undertaken, including methods of procedure. This proposal should be submitted by Winter Quarter of the third year, and it must be approved by a committee of at least three members including the principal research adviser and at least one member from the Committee on Biophysics. The candidate must defend the dissertation proposal in an oral examination. The Dissertation Reading Committee normally evolves from the Dissertation Proposal Review Committee.
6. The student must present a Ph.D. dissertation as the result of independent investigation and expressing a contribution to knowledge in the field of biophysics.
7. The student must pass the University oral examination, taken only after the student has substantially completed the research. The examination is preceded by a public seminar in which the research is presented by the candidate.

COURSES

205. DNA Repair and Mutagenesis—(Enroll in Biological Sciences 205.)
   3 units, Spr (Hanawalt)
   210. Advanced Topics in Membrane Biochemistry—(Enroll in Biochemistry 210.)
   4 units (Pfeffer) not given 2000-01
   210A. Principles of Cell Physiology—(Enroll in Molecular and Cellular Physiology 210.)
   4 units, Spr (Aldrich, Lewis)
   211. Biophysics of Sensory Transduction—(Enroll in Biological Sciences 211.)
   4 units, Spr (Block)
   214. Physical and Chemical Principles of Biochemistry—(Enroll in Biochemistry 214.)
   4 units (Herschlag) not given 2000-01
   225. Molecular Motor Proteins and the Cytoskeleton—(Enroll in Biochemistry 225, Developmental Biology 225.)
   3 units (Fuller, Spudich) not given 2000-01
   228. Protein and Nucleic Acid Structure, Dynamics, and Engineering—(Enroll in Structural Biology 228.)
   3 units, Win (Levitt)
   237. Introduction to Biotechnology—(Enroll in Biochemistry 237, Biological Sciences 237, Chemical Engineering 450, Civil and Environmental Engineering 237, Developmental Biology 237, Structural Biology 237.)
   3 units, Spr (Robertson, Swartz)
   241. Biological Macromolecules—(Enroll in Structural Biology 241.)
   3 units, Aut (Aldrich, Ferrell, Herschlag, Lewis, Puglisi, Weis)

242. Methods in Molecular Biophysics—(Enroll in Structural Biology 242.)
   3 units, Win (Harbry, McKay, Puglisi, Weis)

250. Seminar in Biophysics—All graduate students in Biophysics must participate. Presentation of current research projects and results by all faculty in the Biophysics Program.
   1 unit, Aut, Win (Staff)

255. Responsible Conduct of Research—All graduate students must complete.
   Win

289. Biophysical Chemistry—(Enroll in Chemistry 289.)
   3 units (Staff) not given 2000-01

291. Biophysical Chemistry—(Enroll in Chemistry 291.)
   3 units (Staff) not given 2000-01

   3 units (Solomon) alternate years, given 2001-02

300. Research
   (Staff)
   Other biophysics courses in related departments:
   Chemistry 251, Neurobiology 216
   Other recommended courses:
   Biological Sciences 230; Biochemistry 200; Chemistry 271, 273, 275;
   Physics 170, 171, 230, 231, Structural Biology 211

CHEMISTRY*

Chair: Barry M. Trost
Associate Professors: Christopher E. D. Chidsey, Chaitan Khosla, Thomas J. Wandless
Assistant Professors: Hongjie Dai, Justin Du Bois, Vijay S. Pande, Daniel P. Stack
Consulting Associate Professor: David B. Smith
Lecturers: Stacey F. Bent, Karlene A. Cimprich
Visiting Associate Professor: Marcia B. France
Consulting Associate Professor: Wray H. Huestis

* The curriculum leading to the B.S. degree in Chemical Engineering is described in the "School of Engineering" section of this bulletin.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

Entrance Preparation—Students intending to major in chemistry are expected to have entrance credit in the preparatory subjects of chemistry, physics, and mathematics (including algebra and plane trigonometry). Those who do not have entrance credit or equivalent training in these subjects, particularly mathematics, may experience some difficulty in meeting the department requirements for graduation in four years, especially if they expect to pursue a program leading to professional certification by the American Chemical Society or to the B.S. degree with Honors.
Minimum Requirements—University Writing and General Education Requirements; Mathematics 41, 42, 51, 53; Physics 41, 43, 45, 46, 47, 48; Chemistry 31, 33, 35, 36, 131, 132, 133, 134, 151, 153, 171, 173, 174, 175, 176. In addition, Computer Science 106A and 106B are strongly recommended for students planning graduate study. Students interested in attending overseas campuses should consult their advisers as early as possible to avoid scheduling problems. Note that it is particularly convenient to attend an overseas campus during Spring Quarter of the second or third year, since the courses listed in this quarter may be delayed to subsequent years without disadvantage. No required course may be taken on a credit/no credit basis.

### TYPICAL SCHEDULE FOR A FOUR-YEAR PROGRAM

#### FIRST YEAR

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem. 31. Chemical Principles</td>
<td>A W S</td>
</tr>
<tr>
<td>Chem. 33. Structure and Reactivity</td>
<td>4</td>
</tr>
<tr>
<td>Chem. 35. Monofunctional Compounds</td>
<td>4</td>
</tr>
<tr>
<td>Chem. 36. Chemical Separations</td>
<td>3</td>
</tr>
<tr>
<td>Math 41, 42, 51. Calculus, Linear Equations</td>
<td>5 5 5</td>
</tr>
<tr>
<td>Writing and General Education Requirements or Electives*</td>
<td>6 6 3</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>15 15 15</strong></td>
</tr>
</tbody>
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#### SECOND YEAR

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
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</thead>
<tbody>
<tr>
<td>Chem. 131. Polyfunctional Compounds</td>
<td>3</td>
</tr>
<tr>
<td>Chem. 132. Qualitative Organic Analysis</td>
<td>5</td>
</tr>
<tr>
<td>Chem. 133. Special Topics in Organic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>Chem. 134. Theory and Practice of Quantitative Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>Chem. 136. Synthesis Laboratory (elective)</td>
<td>3</td>
</tr>
<tr>
<td>Math 53. Differential Equations</td>
<td>5</td>
</tr>
<tr>
<td>Physics 41, 43, 45-46. Mechanics, Electricity, and Magnetism</td>
<td>3 3 4</td>
</tr>
<tr>
<td>Electives*</td>
<td>4 8</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>16 15 15</strong></td>
</tr>
</tbody>
</table>

#### THIRD YEAR

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
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<tbody>
<tr>
<td>Chem. 151, 153. Inorganic Chemistry</td>
<td>3 3</td>
</tr>
<tr>
<td>Chem. 171, 173, 175. Physical Chemistry</td>
<td>3 3 3</td>
</tr>
<tr>
<td>Chem. 174, 176. Physical Chemistry Laboratory</td>
<td>4 3</td>
</tr>
<tr>
<td>Physics 47-48. Light and Heat</td>
<td>5</td>
</tr>
<tr>
<td>Electives*</td>
<td>7 5 6</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>15 15 15</strong></td>
</tr>
</tbody>
</table>

#### FOURTH YEAR

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives*</td>
<td>15 15 15</td>
</tr>
</tbody>
</table>

* Elective courses must be used to complete the University Writing, General Education, and Language Requirements. They may also be used to broaden one’s background in science and non-science areas and to provide an opportunity for advanced study in chemistry. Courses offered by other departments that may be of interest to chemistry majors include Biochem 200, 214; Biol. Sci. 31, 32, 33; Chem. Engr. 20, 120, 130; Civ. & Envir. Engr. 170; Comp. Sci. 100A-B; Econ. 1, English 191; Engr. 50; Geo. & Envr. Sci. 278; Math. 44, 106, 109B, 113, 131, 132; Mat. Sci. & Engr. 50; Physics 110, 111, 132; Stat. 60, 110, 116.

### AMERICAN CHEMICAL SOCIETY CERTIFICATION

Students who wish to be certified as having met the minimum requirements of the American Chemical Society for professional training must complete, in addition to the above requirements, at least 6 units from Chemistry 136 and/or 190; and at least 3 additional units from one of the following: Chemistry 136, any chemistry course numbered above 200 for which permission to register had been granted by the instructor, Biochemistry 200, or an advanced course in mathematics or physics. A reading knowledge of German or Russian is strongly recommended.

### HONORS PROGRAM

A limited number of undergraduates may be admitted to the Chemistry honors program at the beginning of the senior year. Those completing the program satisfactorily receive the B.S. degree in Chemistry with Honors.

Admission to the program requires a grade point average (GPA) of at least 3.0 in all course work in the University. In addition to the minimum requirements for the B.S. degree, the student must complete 9 units of Chemistry 190 to be taken 3 units per quarter for three quarters during the junior/senior years; and 9 additional units (including 3 units in chemistry) from Biochemistry 200, 241; Chemistry 221, 223, 225, 251, 253, 255, 271, 273, 275, 279; Mathematics 131, 132; Physics lecture courses numbered greater than 100; or other advanced courses approved by the department’s Undergraduate Study Committee. Students may not overlap ("double-count") courses for completing honors, major, minor, and cotermination requirements. An overall grade point average (GPA) of 3.3 in all chemistry, mathematics, and physics course work including 9 (most recent) units in Chemistry 190 is required for a degree with honors.

Students who wish to be admitted to the honors program should register in the department undergraduate office in Mudd 283 at the beginning of the senior year. Those who do not meet all of the above formal requirements may petition the department for admission.

### TEACHING CREDENTIALS

The requirements for certification to teach chemistry in the secondary schools of California may be ascertained by consulting the section on credentials under the “School of Education” section of this bulletin and the Credential Administrator of the School of Education.

### GRADUATE PROGRAMS

The University’s basic requirements for the M.S., M.A.T., and Ph.D. degrees are discussed in the “Graduate Degrees” section of this bulletin.

### GENERAL REQUIREMENTS

Qualifying Examinations—Each new graduate student must take qualifying examinations on entrance. These examinations consist of three written exams of two hours each in the fields of inorganic, organic, and physical chemistry, and cover such material as ordinarily is given in a rigorous one-year graduate course in each of these subjects. Students majoring in biophysical chemistry must pass examinations in biophysical and physical chemistry, and either organic or inorganic chemistry. Students who fail to pass these examinations in the Autumn Quarter are required to repeat them during the first week of the Winter Quarter. All qualifying examinations are given the week before instruction begins in Autumn Quarter, and must be taken at that time.

Satisfactory performance is required for permission to begin dissertation research and to continue work for an advanced degree. Students on full-time fellowships may complete all requirements for the Ph.D. degree in nine quarters. Students on research or teaching assistantships may complete their requirements in fifteen quarters.

Candidates for advanced degrees must have a minimum grade point average (GPA) of ‘B’ for all chemistry lecture courses as well as for all courses taken during graduate study. Required courses may not be taken with the credit/no credit option. All students are expected to give full time to graduate work once they have begun dissertation research. All prospective Ph.D. candidates, regardless of the source of financial support, are required to gain teaching experience as an integral part of graduate training. During the period in which a dissertation is being read by members of the faculty, candidates must be available for personal consultation until the dissertation has had final department approval.

### MASTER OF SCIENCE

Applicants for the M.S. degree in Chemistry are required to complete, in addition to the requirements for the bachelor’s degree, a minimum of 36 units of work and an M.S. thesis. Of the 36 units, approximately two-thirds must be in the department and must include at least 12 units of advanced course work in chemistry exclusive of the thesis. Of the 12 units, at least 3 units must be from Chemistry 221, 223, 225, 251, 253, 255, 271, 273, 275, or 297.
MASTER OF ARTS IN TEACHING (CHEMISTRY)

In cooperation with the School of Education, the department offers a program leading to the Master of Arts in Teaching (Chemistry). This degree is for candidates who have a teaching credential and wish to strengthen further their academic preparation. The program consists of a minimum of 25 units in the teaching field and 12 units in the School of Education. Detailed requirements are outlined under the “School of Education, Master of Arts in Teaching” section of this bulletin. Not offered 2000-01.

DOCTOR OF PHILOSOPHY

Graduate students are eligible to become formal candidates for the Ph.D. degree after passing the department qualifying examinations, satisfactorily completing most of the formal lecture course requirements, and beginning satisfactory progress on a dissertation research project. They then file for admission to candidacy for the Ph.D. degree. This filing must be done before June of the second year of graduate registration.

After passing the departmental qualifying examinations, students select research advisers by first interviewing at least ten members of the Chemistry faculty about their research. Students then file an Application to Start Research form with the Department of Chemistry Graduate Study Committee and begin research on their Ph.D. dissertation under the supervision of an adviser. All students in good standing are required to start research by the end of the Winter Quarter of the first year of graduate registration.

There is no foreign language requirement for the Ph.D. degree.

Candidates for the Ph.D. degree are required to participate continually in the department seminar (Chemistry 300), and in the division seminar of the major subject. In addition, continuous enrollment in Chemistry 301 is expected after the student has passed the qualifying examinations and chosen a research supervisor. As part of graduate training, Ph.D. candidates are required to gain experience as teaching assistants.

Before candidates may request scheduling of the University oral examination, clearance must be obtained from the major professor and the chair of the department’s Graduate Study Committee. Conditions that must be fulfilled before clearance is granted vary with the different divisions of the department and may be ascertained by consulting the chair of the committee.

It is the policy of the department to encourage and support in every possible way the pursuit of research and other advanced work by qualified students. Information about staff members with lists of their recent research publications is found in Chemistry at Stanford and the Directory of Graduate Research published by the American Chemical Society.

COURSE REQUIREMENTS

Students may major in inorganic, organic, physical, or biophysical chemistry. All graduate students are required to take six graduate-level courses (course numbers greater than 199) of at least 3 units each in chemistry or related disciplines (for example, biochemistry, electrical engineering, mathematics, pharmacology, physics, and so on), to be selected in consultation with their research adviser and the Graduate Study Committee. At least four of these courses should be taken in the first year. In addition, students majoring in Organic Chemistry must take 3 units in Chemistry 231 in the second year and 3 units in 233 in the second and third year. Required courses must be taken for a letter grade.

Students majoring in inorganic, physical or biophysical chemistry, or chemical physics and entering after 1998 must meet with their Reading Committee between the middle of their third year and the end of their fourth year to present past research and to propose and discuss ideas and research goals for the future. A written report of approximately two pages is given to the committee members prior to the mandatory meeting. The meeting consists of a 15-minute presentation plus discussion. The student and/or committee may ask for additional meetings prior to the thesis defense.

CHEMICAL PHYSICS

Students with an exceptionally strong background in physics and mathematics may, upon special arrangement, pursue a program of study in chemical physics.

Ph. D. MINOR

Candidates for the Ph.D. degree in other departments who wish to obtain a minor in chemistry must complete, with a GPA of 3.0 or higher, 20 graduate-level units in chemistry.

FELLOWSHIPS AND SCHOLARSHIPS

In addition to school fellowships and scholarships open to properly qualified students, there are several department fellowships in chemistry. Undergraduate scholarships are administered through the Financial Aid Office. Teaching assistantships and research assistantships are open to graduate students. Graduate fellowships, scholarships, and teaching assistantships are administered through the Department of Chemistry.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

Note—Lab fees, against which charges are made for breakage, are a minimum of $35 per quarter. Students taking courses with an * must preregister in the Department of Chemistry.

UNDERGRADUATE

22N. Stanford Introductory Seminar: The Frontiers of Science—Preference to freshmen. Expands the research focus of Chem. 32. Materials from readings on research breakthroughs, research seminars, and Ph.D. oral examinations campus-wide are integrated in discussions on the nature of modern research. Prerequisite: 32 or equivalent. GER:2a (DR:5)

3 units, Spr (Collman)

23N. Stanford Introductory Seminar: Chemistry and Biology—Preference to freshmen. An enrichment of introductory organic chemistry with biological applications. A clinically important molecule is selected to illustrate important contributions that biology has made to chemistry and vice versa. Topics: structure elucidation of complex molecules, chemical and biological synthesis of complex molecules, mechanism of action, and drug or agrochemical development. Corequisite: 33. GER:2a (DR:5)

3 units, Win (Khosla)

24N. Stanford Introductory Seminar: Nutrition and History—Preference to freshmen. Intended to broaden the introductory chemistry experience. The biochemical basis of historically important nutritional deficiencies (vitamins, minerals, starvation, metabolic variants that predispose to disease) and environmental toxins is related to physiological action and the sociological, political, and economic consequences of its effect on human populations. Prerequisite: high school chemistry. Recommended: 31, 32, or 33. GER:2a (DR:5)

3 units, Spr (Huestis)


2 units, Win (Djerassi)

27Q. Stanford Introductory Seminar: Lasers—The Light Fantastic—Preference to sophomores. Introduction to lasers and their impact on everyday life. The operation of lasers using concepts of atomic and molecular energy levels, optics, and resonance. The way blue light (CD players) is generated from a solid. The use of lasers to produce guide stars
for astronomy, sculpt the cornea, measure molecules in the ozone layer, transmit optical information, process semiconductors into high-density integrated circuits, and observe a single protein molecule in action. Prerequisites: 31 or Physics 23 and 25, or equivalents. GER:2a (DR:5)

3 units, Aut (Moerner)

28N. Stanford Introductory Seminar: Transforming Chemistry—Preference to freshmen. Chemistry is “the science that treats of the structure, composition, and properties of substances and of their transformations.” Among the four facets identified, “transformations” is the one that is most particularly the province of the chemist. Topics: transformations, or chemical reactivity in inorganic species, with emphasis on current hot issues. Prerequisite: 31 or 32 or equivalent. GER:2a (DR:5)

3 units, Win (Taube)

30. Introduction to Chemistry—Preparation for 31. For students with limited background in chemistry and mathematics. Introduction to chemical principles: moles, valence, stoichiometry, definitions, problem solving, quantitative skills.

3 units, Aut (Chidsey)

*31. Chemical Principles—For students with substantial chemistry background. Preparation for chemistry, chemical engineering, medicine, biochemistry, biology, and related fields. Atomic and molecular orbital theory, periodicity, bonding properties of matter, stoichiometry. Recitation. Prerequisites: high school chemistry and algebra. Recommended: high school physics. GER:2a (DR:5)

4 units, Aut (Boxer, Stack)
Win (Fayer, Andersen)
Sum (Staff)

*32. The Frontiers of Chemical Science—For students with AP Chemistry scores of 4 or 5 who wish to develop a deeper understanding. Complements a previous rigorous introduction to chemistry, encompassing structure and reactivity, and cutting across the traditional subdivisions of chemistry. Recent advances in structures, analytical methodologies, catalysis, redox phenomena, organometallic, and bio-inorganic chemistry. Lab and recitation. GER:2a (DR:5)

5 units, Aut (Collman, Zare)

*33. Structure and Reactivity—Organic chemistry, functional groups, hydrocarbons, stereochemistry, thermochemistry, kinetics, chemical equilibria. Recitation. Prerequisite: 31, 32, or an AP Chemistry score of 4 or 5. GER:2a (DR:5)

4 units, Win (Touster, Stack)
Spr (Wender)
Sum (Staff)

*35. Organic Monofunctional Compounds—Organic chemistry of oxygen and nitrogen aliphatic compounds. Recitation. Prerequisite: 33.

4 units, Aut (Huesis)
Spr (Du Bois, Flygare)
Sum (Staff)

*36. Chemical Separations—Techniques for separations of compounds; distillation, crystallization, extraction, and various chromatographic procedures. Lecture treats the theory; lab provides practice. Prerequisites: 33 and concurrent or previous enrollment in 35.

3 units, Spr (Touster)
Sum (Staff)

110. Directed Instruction/Reading—Undergraduates pursue a reading program under supervision of a faculty member in Chemistry; may also involve participation in lab. Prerequisites: superior work in 31 or 32, and approval of the instructor and of the Chemistry Undergraduate Study Committee.

1-2 units (Staff)

*130. Theory and Practice of Identification—For students in biomedical sciences; Chemistry majors take 132. Lectures on theory and interpretation of ultraviolet, infrared, nuclear magnetic resonance, and mass spectral data. Lab involves identification of unknowns and components of a mixture using derivatives and spectra. Lab. Prerequisites: 35, 36 (36 and 130 should be taken in consecutive years). Corequisite: 131.

4 units, Aut (Touster, Silcoff)

*131. Organic Polyfunctional Compounds—Aromatic compounds, polysaccharides, amino acids, proteins, natural products, dyes, purines, pyrimidines, nucleic acids, and polymers. Prerequisite: 35.

3 units, Aut, Win (France, Kool)

*132. Qualitative Organic Analysis—Required of and limited to chemistry majors; others may be admitted with consent of instructor. Separation of mixtures of organic compounds and identification of the components using rational synthesis and analysis of spectral data. Lab. Prerequisites: 35, 36, and concurrent registration in 131.

5 units, Aut (Touster, Staff)


3 units, Win (Smith, Goldstein)

*134. Theory and Practice of Quantitative Chemistry—Methods include gravimetric, volumetric, spectrophotometric, and electrometric. Lab. Prerequisite: 130 or 132. (WIM)

5 units, Win (Zare)

135. Physical Chemical Principles—Terminal physical chemistry for non-chemistry majors. Emphasis is on portions of physical chemistry most useful for students of the life sciences. Introduction to chemical thermodynamics, heterogeneous equilibria, thermodynamics of solutions, electrolytes, chemical kinetics, macromolecular solutions, and colloidal dispersions. Prerequisites: 31, calculus.

3 units, Win (Pecora)

*136. Synthesis Laboratory—Advanced synthetic methods in organic and inorganic laboratory chemistry. Prerequisites: 130 or 132, 131.

3 units, Spr (Touster)

151. Inorganic Chemistry I—Systematic introduction to the theories of electronic structure, stereochemistry, and symmetry properties of inorganic and organometallic molecules. Topics: ionic and covalent interactions, electron-deficient bonding, and elementary ligand field and molecular orbital theories. Emphasis is on the chemistry of the metallic elements. Prerequisites: 35. Recommended: 171.

3 units, Win (Collman)

153. Inorganic Chemistry II—Systematic presentation of the theoretical aspects of inorganic chemistry. Group theory; many electron atomic theory; molecular orbital theory, emphasizing general concepts and group theory; ligand field theory; application of physical methods to predict the geometry, magnetism, and electronic spectra of transition metal complexes; and theoretical aspects of electron transfer reactions. Prerequisites: 151, 173.

3 units, Spr (Solomon)

171. Physical Chemistry—Chemical thermodynamics; fundamental principles, Gibbsian equations, systematic deduction of equations, equilibrium conditions, phase rule, gases, solutions. Prerequisites: 35; Mathematics 51.

3 units, Aut (Pande)

173. Physical Chemistry—Introduction to quantum chemistry: the basic principles of wave mechanics, the harmonic oscillator, the rigid rotator, infrared and microwave spectroscopy, the hydrogen atom, atom-
ic structure, molecular structure, valence theory. Prerequisites: Mathematics 51, 53; Physics 41, 43, 45, 47.
3 units, Win (Boxer)

*174. Physical Chemistry Laboratory—Thermodynamics, transport, and spectroscopy. Experimental techniques include electronics, potentiometry, amperometry, calorimetry, and Fourier-transform infrared spectroscopy. Lab. Prerequisites: 134, 171, previous or concurrent enrollment in 173; Mathematics 53; and Physics 46, 48.
4 units, Win (Chidseyn)

3 units, Spr (Moerner)

*176. Physical Chemistry Laboratory—Use of chemical instrumentation to study fundamental areas of physical chemical time-dependent processes. Experiments include reaction kinetics, fluorimetry, and nuclear magnetic and electron spin resonance spectroscopy. Lab. Prerequisites: 173, 174, previous or concurrent enrollment in 175.
3 units, Spr (Dai)

GRADUATE

Undergraduates may register for chemistry courses numbered above 200 only if admitted to the honors program or by consent of the instructor.

3 units, Aut (Kool)

223. Advanced Organic Chemistry—Continuation of 221 with emphasis on physical methods. Prerequisite: 221 or consent of instructor.
3 units, Win (Du Bois)

225. Advanced Organic Chemistry—Continuation of 223. Organic reactions, new synthetic methods, conformational analysis, and exercises in the syntheses of complex molecules. Prerequisite: 223 or consent of instructor.
3 units, Spr (Wender)

227. Selected Topics in Organic Chemistry—May be repeated for credit. Possible topics: synthetic organic chemistry, photochemistry, inorganic-organic chemistry, bio-organic chemistry, reaction mechanisms, stereochemistry, structural chemistry of organic and biological molecules.
3 units (Staff)

229. Organic Chemistry Seminar—Attendance required of all graduate students majoring in organic chemistry. Students giving seminars register for 231.
1 unit, Aut, Win, Spr (Brauman)

231. Organic Chemistry Seminar Presentation—Required of all graduate students majoring in organic chemistry for the year in which they present their organic seminar. Second-year students must enroll all quarters.
1 unit, Aut, Win, Spr (Brauman)

232. Protein Science and Engineering—(Same as Chemical Engineering 452.) The physics-chemical interactions that govern structure and the function of proteins. Topics: protein function and structure, techniques for probing protein structure and function, mechanisms of protein function, design of proteins with novel properties. Examples from literature on enzymes. Recommended: background in physical and organic chemistry.
3 units, Win (Khosla)

233. Creativity in Organic Chemistry—Required of all second- and third-year Ph.D. candidates in organic chemistry. The art of formulating, writing, and orally defending a research progress report and two research proposals is practiced and criticized. Second-year students enroll Autumn and Spring, 3rd-year students enroll Winter.
1 unit, Aut, Win, Spr (Brauman)

235. Applications of NMR Spectroscopy—The uses of NMR spectroscopy in chemical and biochemical sciences, emphasizing data acquisition for liquid samples and including selection, setup, and processing of standard and advanced experiments.
3 units, Win (Staff)

251. Selected Topics in Advanced Inorganic Chemistry—May be repeated for credit. Prerequisites: one year of physical chemistry, consent of instructor.
3 units (Staff) not given 2000-01

253. Advanced Physical Inorganic Chemistry—Electronic structure and physical properties of transition metal complexes. Ligand field and molecular orbital theories, magnetism and magnetic susceptibility, electron paramagnetic resonance (including hyperfine interactions and zero field splitting) and electronic absorption spectroscopy (including vibrational interactions). Prerequisite: 153 or the equivalent.
3 units (Solomon) alternate years, given 2001-02

3 units, Aut (Waymouth)

257. Research Proposals in Inorganic Chemistry—May be required of second-year students in inorganic chemistry at the discretion of the research adviser. Research progress reports and research proposals are presented in oral and written form. Writing ability, oral defense, and scientific content is criticized.
1 unit, Aut, Win, Spr (Staff).

259. Inorganic Chemistry Seminar—Attendance required of all graduate students majoring in inorganic chemistry.
1 unit, Aut, Win, Spr (Staff)

271. Advanced Physical Chemistry—The principles of quantum mechanics. General formulation, mathematical methods, and elementary applications of quantum theory to the structure of atoms and molecules, including variational procedures, perturbation theory, operator and matrix methods, theory of angular momentum, and elements of the electronic structure of atoms. Prerequisite: 175.
3 units, Aut (Fayer)

273. Advanced Physical Chemistry—Topics in advanced quantum mechanics: vibrations and rotations of polyatomic molecules (normal modes, anharmonicity, wavefunctions and energy levels of rigid rotations, vibration-rotation interaction), ab initio electronic structure theory (Hartree-Fock, configuration interaction, multiconfiguration self-consistent-field, and many-body perturbation theory techniques), angular momentum theory (operators and wavefunctions, Clebsch-Gordan coefficients, rotation matrices), time-dependent quantum mechanics (time evolution operator, Feynman path integrals, scattering theory, Born approximation, Lipmann-Schwinger equation, correlation functions).
interaction of radiation and matter (semiclassical and quantum theories of radiation, transition probabilities, selection rules). Prerequisite: 271 or Physics 230.

3 units, Win (Dai)

275. Advanced Physical Chemistry—The basic principles and methods of statistical mechanics from the ensemble point of view, statistical thermodynamics, heat capacities of solids and polyatomic gases, chemical equilibria, equations of state of fluids, phase transitions. Prerequisite: 271.

3 units, Spr (Pande)

276. Advanced Physical Chemistry—Time-dependent statistical mechanics: ensemble theory for equilibrium and nonequilibrium systems; static and dynamic correlation functions for fluctuating equilibrium systems; the relationship of correlation functions, spectroscopy, and transport; dynamical models used in chemistry, including classical mechanics, quantum mechanics, Brownian dynamics, Smoluchowski dynamics, and Markov processes. Applications to topics of interest in physical chemistry. Prerequisite: 275.

3 units, Aut (Andersen)

277. Selected Topics in Physical Chemistry—Possible topics: structure elucidation using diffraction techniques, advanced statistical mechanics, crystal field theory, advanced quantum mechanics, magnetic relaxation, advanced thermodynamics, chemical applications of group theory. May be repeated for credit. Prerequisite: 275 or consent of instructor.

3 units (Staff)

279. Physical Chemistry Seminar—Required of all graduate students majoring in physical chemistry.

1 unit, Aut, Win, Spr (Staff)

283. Research Proposals in Physical Chemistry—May be required of 2nd- and 3rd-year graduate students at the discretion of the research adviser. Students present research proposals and progress reports on their research in physical chemistry, using oral and written forms. Topics may be drawn from the student’s research of a related area in physical chemistry. Written form, oral presentation, and scientific merit are evaluated.

1 unit, Aut, Win, Spr (Staff)

287. Biophysical Chemistry—The theoretical and experimental aspects of biophysical phenomena, emphasizing membrane biophysics and membrane biology. Pre- or corequisites: 171 and 173, or the equivalent.

3 units (Staff) not given 2000-01

289. Biophysical Chemistry—Experimental methods in biophysics. Emphasis is on spectroscopic techniques including magnetic resonance and optical methods. Prerequisite: 287.

3 units (Staff) not given 2000-01

291. Biophysical Chemistry—Special topics in biophysical chemistry. Pre- or corequisites: 171 and 173, or the equivalent.

3 units (Staff) not given 2000-01

293. Structural Inorganic Chemistry—Structural biophysical chemistry, x-ray crystallography, and related techniques as used in biophysical research. Electron and optical microscopy and neutron diffraction. Prerequisite: 291 or consent of instructor.

3 units (Staff) not given 2000-01

297. Bio-Inorganic Chemistry—Overview of metal sites in biology. Metalloproteins as elaborated inorganic complexes, their basic coordination chemistry and bonding, unique features of the protein ligand, and the physical methods used to study active sites. Active site structures are correlated with function. Prerequisites: 153 and 173, or equivalents.

3 units (Solomon) alternate years, not given 2001-02

299. Teaching of Chemistry—Required of all teaching assistants in chemistry. Techniques of teaching chemistry by means of lectures and labs.

1-3 units, Aut, Win, Spr (Staff)

300. Department Colloquium—Required of all graduate students.

1 unit, Aut, Win, Spr (Staff)

301. Research in Chemistry—Required of all graduate students who have passed the qualifying examination. Open to qualified graduate students with the consent of the major professor. Research seminars and directed reading deal with newly developing areas in chemistry and experimental techniques. May be repeated for credit. Students register giving section number of staff member and number of units agreed upon.

2 units, Aut, Win Spr (Staff)

459. Frontiers in Interdisciplinary Biosciences—(Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible.) Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford’s Clark Center for interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

2 units, Aut, Win, Spr (S. Block)

RESEARCH AND SPECIAL ADVANCED WORK

190. Introduction to Methods of Investigation—Limited to undergraduate students admitted under the honors program or by special arrangement with a member of the teaching staff. For general character and scope, see 200. Prerequisite: 132. Corequisite: 300.

(Staff)

200. Research and Special Advanced Work—Properly qualified graduate students are encouraged to undertake research, or advanced lab work not covered by listed courses, under the direction of a member of the teaching staff. For research and special work, students register for 200 (190, if undergraduate), giving section number of staff member under whom work is carried on and number of units agreed upon.

(Staff)

CLASSICS

Emeriti: (Professors) Mark W. Edwards, Michael H. Jameson, Edward Spofford, Michael Wigodsky

Chair: Susan A. Stephens

Graduate Director: Richard Martin

Undergraduate Director: Reviel Netz

Professors: Alessandro Barchiesi, Andrew M. Devine, Richard P. Martin, Marsh H. McCall, Jr., Ian Morris (Classics, History), Michael Shanks, Susan A. Stephens, Susan Treggiari (Classics and, by courtesy, History)

Associate Professors: Jody Maxmin (Art and Art History, Classics), Andrea W. Nightingale (Classics, Comparative Literature), M. Rush Rehm (Classics, Drama)

Assistant Professors: Joy Connolly, Joseph G. Manning, Reviel Netz, Yasmin Syed

Courtesy Professors: George Brown, Robert C. Gregg, Ian Hodder
UNDERGRADUATE PROGRAMS

The Department of Classics offers courses on all aspects of Greek and Roman culture: art and archaeology, cultural studies, history, language, literature, and philosophy. The department offers five majors in Classics (Ancient History, Classical Studies, Greek, Greek and Latin, and Latin) which vary in the number of language courses they require; each of these majors can be completed in conjunction with a second major in the sciences or in other humanities departments.

The major in Classics affords an opportunity to develop a competence in the classical languages; an appreciation, comprehension, and enjoyment of classical literature; and an understanding of the history and culture of the ancient world, and its connections with the present. The department encourages students who wish to do their major work in Classics and also students who wish to relate work in Classics to work in other departments.

BACHELOR OF ARTS

Prospective majors in Classical Studies, Greek, and Latin (options 1, 2, and 3) are encouraged to declare at the beginning of the junior year but are urged to discuss their plans with the Undergraduate Director as early as possible. Students who choose to major in Greek and Latin (option 4) should begin the curriculum as soon as possible, since it is difficult to complete the language requirements without an early start. Those with no previous knowledge of Latin or Greek should begin study in the freshman year or as early as possible in the sophomore year.

To declare the major, a student must fill out the Declaration of Major form in the Registrar’s Office and meet with the Undergraduate Director in the Department of Classics. At that time, the Undergraduate Director assigns each student a department adviser who helps to prepare a program of study; students should meet with their advisers at least once a quarter. Each student’s progress towards fulfillment of the major requirements is recorded in a file kept in the main office. It is the student’s responsibility to work with his or her adviser in keeping this file up to date.

The A.B. degree may be earned by fulfilling the requirements for one of the five following majors:

1. **Classical Studies:** at least 60 units, including at least two courses in Latin or Greek at the 100 level or higher, or one course in one of the languages at the 100 level or higher plus the series 1, 2, 3, or 51 and 52 in the other language (or an equivalent approved by the department). In addition, students are required to take the Majors Seminar (378-176) and at least one course in each of the following five groups: ancient history, art and archaeology, literature in translation, philosophy, religion and mythology. Students are strongly urged to meet with the Undergraduate Director to discuss options for pursuing a period of study in the Mediterranean region.

   This major is recommended for students who wish to study the classical civilizations in depth but do not wish to study the languages to the extent required by options 2, 3, and 4. It is not suitable for students who wish to do graduate work in Classics or to teach Latin or Greek in high school, as the language work is insufficient for these purposes.

2. **Greek:** at least 60 units, including a minimum of 31 units in Greek courses at the 100 level or higher (it is recommended that no one of these courses be Greek 175A, although this course should not be taken until students have completed three years of Greek). In addition to courses in Greek, students are required to take the Majors Seminar (378-176) and at least one course in each of the following three groups: ancient history and civilization, historical and social theory. The courses chosen must be approved in advance by the Undergraduate Director. With the approval of the instructor and the Undergraduate Director, students may substitute graduate seminars in ancient history for some of these courses.

   Breadth Requirement: each student must take at least 4 units in each of the following areas—archaeology and art, comparative ancient civilizations, historical and social theory. The courses chosen must be approved in advance by the Undergraduate Director, and will normally be chosen from the list of recommended courses below:

   1. Archaeology and Art: for example, any course with the 372 prefix; Cultural and Social Anthropology 1/101, 90, 211; Archaeology 33; Art and Art History 100A, B, or C, 120A, 200, 200C.
   2. Comparative Ancient Civilizations: for example, Anthropological Sciences 3, 7, 103, 106, 107, 108, 141, 150; History 192A.
   3. Historical and Social Theory: for example, Cultural and Social Anthropology 1/101, 90; History 173C, 202, 206; Sociology 1, 110, 113, 140, 142, 170.

   Students are strongly urged to meet with the Undergraduate Director to discuss options for pursuing a period of study in the Mediterranean region.

3. **Latin:** at least 60 units, including a minimum of 31 units in Latin courses at the 100 level or higher (it is recommended that one of these courses be Latin 175A, although this course should not be taken until students have completed three years of Latin). In addition to courses in Latin, students are required to take the Majors Seminar (378-176) and at least one course in each of the following three groups: history/archaeology, literature in translation, and philosophy/religion. The introductory sequence (1, 2, 3, or 51 and 52) or one 100-level course in Greek is recommended. Beginning courses in Latin, if required, may be counted towards the total of 60 units. Relevant courses in other departments of the humanities may count towards the major with the consent of the Undergraduate Director. Students are strongly urged to meet with the Undergraduate Director to discuss options for pursuing a period of study in the Mediterranean region.

4. **Greek and Latin:** at least 60 units, including 30 units in Greek courses and the same number in Latin. It is recommended that students take Greek 175A or Latin 175A (or both), although these courses should not be taken until students have completed three years of the respective language. All students are required to take the Majors Seminar (378-176); it is strongly recommended that students take a course in ancient history. Relevant courses in other departments of the humanities may count towards the major with the consent of the Undergraduate Director. Students are strongly urged to meet with the Undergraduate Director to discuss options for pursuing a period of study in the Mediterranean region.

5. **Ancient History Major:** at least 60 units of approved courses. All courses counted for the degree must be taken for a letter grade. Students must satisfy four requirements:

   a. Writing in the Major (WIM) Requirement: this is fulfilled by taking the Majors Seminar (5 units), Interpreting Antiquity (378-176).
   b. Depth Requirement: a major must take at least 40 units of ancient history and civilization courses, drawn from courses with 371 and 378 prefixes. The courses chosen must be approved in advance by the Undergraduate Director. With the approval of the instructor and the Undergraduate Director, students may substitute graduate seminars in ancient history for some of these courses.
   c. Breadth Requirement: each student must take at least 4 units in each of the following areas—archaeology and art, comparative ancient civilizations, historical and social theory. The courses chosen must be approved in advance by the Undergraduate Director, and will normally be chosen from the list of recommended courses below:

   1. Archaeology and Art: for example, any course with the 372 prefix; Cultural and Social Anthropology 1/101, 90, 211; Archaeology 33; Art and Art History 100A, B, or C, 120A, 200, 200C.
   2. Comparative Ancient Civilizations: for example, Anthropological Sciences 3, 7, 103, 106, 107, 108, 141, 150; History 192A.
   3. Historical and Social Theory: for example, Cultural and Social Anthropology 1/101, 90; History 173C, 202, 206; Sociology 1, 110, 113, 140, 142, 170.

   Students are strongly urged to meet with the Undergraduate Director to discuss options for pursuing a period of study in the Mediterranean region.

**MINORS**

The Undergraduate Director meets with each student who opts for a minor to discuss his/her chosen curriculum and assigns the student an adviser in the relevant field. Students are required to work closely with their advisers to create a cohesive curriculum within each area. Students
may organize their curriculum according to different principles: for example, they may wish to focus on a specific historical period (Classical Athens, Imperial Rome), or on a specific theme or topic (women in antiquity). After consulting with the adviser, each student must submit (in writing) a "Proposed Curriculum" to the Undergraduate Director. Students may proceed with the minor when the Undergraduate Director has approved the proposal. Courses offered in Greek and Latin above the 100 level may count toward the minor, provided the subject matter is suitable.

All students minoring in Classics are required to take the Majors Seminar (378-176), Interpreting Antiquity, which is writing intensive. Students may choose between three minors in Classics:

1. **Classical Languages**:
   - Students are required to take a minimum of five courses in Greek or in Latin plus the Majors Seminar (378-176). Students wishing to combine Greek and Latin may only do so if courses for one of the two languages are all above the 100 level; for example, Greek 51, 52, plus Latin 103, 111, 175.

2. **History**:
   - Students are required to take a minimum of five courses in history, art history, and archaeology plus the Majors Seminar (378-176). Courses offered in Latin and Greek that focus on historical topics or authors may count toward the minor.

3. **Literature and Philosophy**:
   - Students are required to take a minimum of five courses in classical literature or philosophy plus the Majors Seminar (378-176). Courses offered in Latin and Greek that focus on philosophical or literary topics or authors may count toward the minor.

**HONORS PROGRAMS**

A minimum grade point average (GPA) of ‘B+’ in Classics courses is required for students to enroll in the honors program. To be considered for honors, students must select a professor who can supervise his or her honors thesis. Together with the supervisor, the student writes a two- to three-page proposal at the beginning of the senior year. The proposal should outline the project in detail, list relevant courses that have been taken, and name the supervisor. The department gives approval only if it is satisfied that the student has a sufficient basis of knowledge derived from department course work in the general areas of the thesis course (that is, course work in art, Greek, and/or Latin language, history, literature, philosophy, and so on). If the proposal is approved, the student may sign up for Undergraduate Thesis (378-199) during one or two quarters of the senior year for a maximum of 6 units a term, up to an overall total of 10 units. Honors are awarded only if the essay receives a grade of ‘B+’ or higher from the supervisor and a second reader.

**HUMANITIES**

For majors in Classics with appropriate interests, the honors program in Humanities is available, a description of which is found under the “Interdisciplinary Studies in Humanities” section of this bulletin.

**OVERSEAS STUDIES**

Funding: Students whose record in Classics indicates that they are fully qualified for a given program may apply for funding from the Department of Classics. Students must submit a proposal to the Undergraduate Director, which should include an itemized list of expenses based on the fees charged by the program (that is, room, board, tuition, and other expenses). Limited funding is available each year; preference is shown to students with strong records.

Programs:

1. **Rome**: Classics majors are encouraged to apply for the Intercollegiate Center for Classical Studies (ICCS) in Rome which is managed by Duke University for about 50 constituent colleges and universities. It is open to Stanford majors in Classics, History, and Art History. All courses receive full credit at Stanford and may be applied to the respective major. Students interested in this program should consult the Undergraduate Director and the ICCS representative in the Department of Classics as early as possible in their career at Stanford to plan their course preparation and application. Competition is strong and applicants are expected to have taken one or more courses in Roman history and at least two years of Latin before they arrive in Rome. Brochures are available at the department office.

Other programs offer a quarter, semester, or summer session in Rome. Interested students are urged to visit Bechtel International Center.

2. **Greece**: Students are encouraged to apply for the summer session at the American School of Classical Studies in Athens. The school is recommended principally for Classics majors with at least two years of ancient Greek. A student wishing to apply should prepare by taking courses in Greek history, archaeology, and art; beginning Modern Greek is strongly recommended. Applicants should see the Undergraduate Director early in the academic year. Other programs offer a quarter, semester, or summer session in Greece. Interested students are urged to visit Bechtel International Center.

**GRADUATE PROGRAMS**

**MASTER OF ARTS**

University requirements for the master’s degree are described in the “Graduate Degrees” section of this bulletin. Students who have completed an undergraduate major in Classics (Greek and/or Latin) or its equivalent may be accepted as candidates for the A.M. degree in Classics or A.M. in Classics in the field of Greek or Latin, and may expect to complete the program in twelve months (usually three quarters of course work plus three months study for the thesis or examination). Students without an undergraduate major in Classics may also be accepted as candidates, though they may require a longer period of study before completing the requirements for the degree. These requirements are:

1. Attaining a standard of scholarship such as would be reached by three quarters of study in the department after fulfilling the requirements for an undergraduate major in the department. Normally, this means completing at least 18 units of graduate courses and 18 units of work at the 140 level or above.

2. Satisfactory completion of one Greek course at the 100 level (if the undergraduate major has been Latin) or one Latin course at the 100 level (if the undergraduate major has been Greek).

3. Passing an examination testing the candidate’s ability to translate into English from a selected list of Greek and/or Latin authors.

4. Satisfactory completion of the 275A,B sequence in at least one language (Latin or Greek).

5. Writing a thesis, or passing an examination on a particular author or topic, or having written work accepted by the graduate committee as equivalent. Three completed and satisfactory seminar papers are normally an acceptable equivalent.

6. Reading knowledge of French or German.

7. Completion of a Program Proposal for a Master’s Degree form in the first quarter of enrollment.

Candidates for the Ph.D. degree may also (on the recommendation of the department) become candidates for the A.M. degree. In their case, requirement "5" above is waived provided that they have completed some work beyond the course requirements listed under requirements '1' and '2' above.

**DOCTOR OF PHILOSOPHY**

University requirements for the Ph.D. are described in the “Graduate Degrees” section of this bulletin. All candidates for the Ph.D. degree in Classics must fulfill the following requirements:

1. Complete at least three years (nine quarters) of full-time work, or equivalent, in study beyond the bachelor’s degree. This must include the 207-208 sequence (unless the student is exempted by examination) and the 275A,B sequence, and normally at least twelve graduate seminars acceptable to the department, in addition to the doctoral dissertation. At least three consecutive quarters of graduate work and the final units of credit in the program must be taken at Stanford. More detailed information on the Ph.D. program is available from a brochure in the Department of Classics office.
2. Candidates are required to pass examinations as follows:
   a) Reading examinations in French and German. In some circumstances Italian may be substituted for French. Students should plan to satisfy this requirement as soon as possible, normally no later than the end of the second year.
   b) Translation examinations into English from prepared sets of Greek and Latin authors. These examinations must be taken at the end of the first year and at the end of the second year as part of the requirement for the 207-208 sequence.
   c) General examinations in four of the following fields: Greek literature, Latin literature, ancient philosophy, Greek history, and Roman history. At least one field must be historical and another must be literary, and at least one field must be Greek and another must be Latin or Roman. Students select the fields in consultation with the Graduate Director no later than June of the second year of graduate study. Three of the fields are tested by written examination combined with a supplemental general oral examination. General examinations must be taken in October of the third year.
   d) The University oral examination on the candidate's dissertation. The examinations, in translation from Greek and Latin authors, must be taken at the end of the first and at the end of the second year of graduate work, the general written and oral examinations in October of the third year, and the University oral examination at the end of the dissertation. In preparing for the general examinations, candidates are expected to make full use of relevant secondary material in modern languages. They should therefore plan to satisfy the requirements in French and German as soon as possible, preferably before the translation examinations. Except in very special circumstances, candidates may not take the general examinations until the modern language requirements have been completed.

3. Each candidate, after passing the general examination, selects a dissertation director who must be a member of the Academic Council. In consultation with the dissertation director, the candidate prepares a statement of the dissertation topic to be submitted for approval by the Graduate Committee. When the statement of the dissertation topic has been approved, the candidate, the dissertation director, and the Graduate Committee collaborate to select an appropriate dissertation committee. Two of the three members of the reading committee, including the chair, must be members of the Academic Council.

4. All students are required to undertake the equivalent of four one-quarter courses of teaching under department supervision. This teaching requirement is normally completed during the second and third years of study.

Ph.D. MINOR

For a graduate minor, the department recommends at least 20 units in Latin or Greek at the 100 level or above, and at least one course at the graduate (200) level.

CLASSICS AND A MINOR FIELD

The Ph.D. in Classics may be combined with a minor in another field, such as anthropology, history, humanities (see below), classical linguistics (see below), or philosophy. Requirements for the minor field vary, but might be expected to involve about six graduate-level courses in the field and one written examination, plus a portion of the University oral exam. Such a program is expected to take five years. The department encourages such programs for especially able and well prepared students and is normally able to offer one fellowship each year to support a student in the fifth year of a combined program. The following timetable would be typical for a five-year program:

   First Year: course work, almost entirely in Classics. One translation exam taken in June. One or both modern language exams taken.
   Second Year: course work, both in Classics and the minor field. Second translation exam completed. French and German exams completed.
   Third Year: course work, both in Classics and the minor field. General examinations in Classics.

Fourth Year: remaining course work, both in Classics and the minor field.

General examination in the minor field. Preparation for dissertation.

Fifth Year: dissertation, University oral examination.

GRADUATE PROGRAM IN HUMANITIES

The Department of Classics participates in the Graduate Program in Humanities leading to the joint Ph.D. degree in Classics and Humanities. For a description of that program see the "Interdisciplinary Studies in Humanities" section of this bulletin.

COMPARATIVE LITERATURE

The Department of Classics cooperates closely with the graduate program in the Department of Comparative Literature. Interested students should consult the chair of the department.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

GREEK

UNDERGRADUATE

Students whose major work is in another department and who wish to fulfill a departmental foreign language requirement by taking Greek should consult their department advisers to determine the precise nature of that department's requirements.

Courses in Greek all have department prefix 373.

1. First-Year Greek—For beginners.
   5 units, Aut (Teiman)

2. First-Year Greek—Continuation of 1.
   5 units, Win (Tieman)

3. First-Year Greek—Continuation of 2.
   5 units, Spr (Tieman)

10. Intensive First-Year Greek—Intensive beginning Greek equivalent to 1, 2, 3. The goal is the reading of easy classical or New Testament Greek by the end of the quarter. Short readings in philosophical Greek.
   8-9 units, Sun (Staff)

51. First-Year Greek—Accelerated.
   10 units, given 2001-02

52. First-Year Greek—Accelerated. Continuation of 51.
   10 units, given 2001-02

INTERMEDIATE/ADVANCED

Students are admitted to these courses by completing Greek 3, 10, or 51-52, or on the basis of previous work done in secondary school or elsewhere. Usually two to three years of secondary school Greek qualifies a student for 101, three to four years for 111. Students with previous knowledge of Greek should consult the Undergraduate Director in Classics to determine the course for which they are best suited.

Students whose major work is in another department and who wish to fulfill a departmental foreign language requirement by taking Greek should consult their department advisers to determine the precise nature of that department's requirements. Most departments are satisfied if part of the series 101, 102, 103 is completed.

101. Second-Year Greek—Selections from Plato, Xenophon, Lucian.
   5 units, Aut (Rogers)

102. Second-Year Greek—Greek Tragedy, one play.
   5 units, Win (Martin)

183. Second-Year Greek—Homer, selected books from the Odyssey.
   5 units, Spr (Alonge)
104. New Testament Greek
2-3 units, given 2001-02

111. Third-Year Greek—Poetry.
3-5 units, Aut (Alonge)

112. Third-Year Greek—Scientific writing.
3-5 units, Win (Netz)

113. Third-Year Greek—Plato.
3-5 units, Spr (Romano)

175/275A,B. Greek Syntax—(First-year graduate students register for 275.) The nuances of Greek syntax and style, the stylistic analysis of selected prose authors, techniques of sight-translation, and the writing of idiomatic Greek prose. Begins the 5th week of the Winter Quarter and continues through the end of the Spring Quarter. Prerequisite for undergraduates: three years of Greek.

2 units, Win (Syed) (Sweeks)
4 units, Spr (Stephens)

370. Advanced Greek Prose or Verse Composition
2-3 units, given 2001-02

LATIN

UNDERGRADUATE

Students whose major work is in another department and who wish to fulfill a departmental foreign language requirement by taking Latin should consult their department’s advisers to determine the precise nature of those requirements. Most departments are satisfied if part of the series 101, 102, 103 is completed.

Courses in Latin have department prefix 375.

1. First-Year Latin—For beginners.
5 units, Aut (Serfass)

2. First-Year Latin—Continuation of 1.
5 units, Win (Serfass)

3. First-Year Latin—Continuation of 2.
5 units, Spr (Serfass)

10. Intensive First-Year Latin—Intensive beginning Latin equivalent to 1, 2, 3, or 51 and 52. The goal is the reading of easy Latin prose and poetry by the end of the quarter.
8-9 units, Sum (Staff)

51. First-Year Latin—Accelerated.
10 units, given 2001-02

52. First-Year Latin—Accelerated; continuation of 51.
10 units, given 2001-02

INTERMEDIATE/ADVANCED

Students are admitted to these courses by completing Latin 3, 10, 51, and 52, or on the basis of previous work done in secondary school or elsewhere. Usually two to three years of secondary school Latin qualifies a student for 101, three to four years for 111. Students with previous knowledge of Latin should consult the Undergraduate Director in Classics to determine the course for which they are best suited. Students whose major work is in another department and who wish to fulfill a departmental foreign language requirement by taking Latin should consult their department’s advisers to determine the precise nature of those requirements. Most departments are satisfied if part of the series 101, 102, 103 is completed.

5 units, Aut (Kleps)

5 units, Win (Connolly)

103. Second-Year Latin—Selections from Vergil, Aeneid, selected books.
5 units, Spr (Lavigne)

111. Third-Year Latin—Poetry, lyric.
3-5 units, Aut (Kelly)

112. Third-Year Latin—Poetry.
3-5 units, Win (Lavigne)

3-5 units, Spr (Rogers)

175/275A,B. Latin Syntax—(First-year graduate students register for 275.) Intensive review of Latin syntax. Begins in Autumn Quarter and ends the 5th week of the Winter Quarter. Prerequisite for undergraduates: minimum of three years of Latin.

4 units, Aut (Devine)
2 units, Win (Devine) (five weeks)

370. Advanced Latin Prose or Verse Composition
2-3 units, any quarter (Staff)

GRADUATE

These courses have department prefix 378.

205A,B. The Semantics of Grammar—Supplements Latin and Greek 275, providing an introduction to the grammatical encoding of semantic and informational meaning. Topics: case, gender, tense, and aspect. A theoretical background for teachers of Greek and for the analysis of literary and non-literary texts.

2 units, Aut (Devine)
1 unit, Win (Devine)

207A,B,C, 208A,B,C. Survey of Greek and Latin Literature—Required two-year sequence focusing on the origins, development, and interaction of Greek and Latin literature, history, and philosophy. Greek and Latin material are taught in alternate years.

207A. Republican Latin
4-5 units, Aut (Syed)

207B. Augustan Age
4-5 units, Win (Barchesi)

207C. Imperial Latin
4-5 units, Spr (Connolly)

208A. Archaic Greek
4-5 units, given 2001-02

208B. Classical Greek
4-5 units, given 2001-02

208C. Hellenistic and Latin Greek
4-5 units, given 2001-02

Some of the above courses may be continued the following quarter by arrangement with the instructor. This usually requires the writing of an extended research paper based on work directly related to the course.

COURSES IN TRANSLATION

UNDERGRADUATE

These courses have department prefix 378.

1. An Introduction to Ancient Egyptian Hieroglyphics—The ancient Egyptian writing system had more than 3,000 years of continuous development covering stories, letters, and documents concerning the history of women, law, economics, and medicine. Introduces the language and its scripts to be able to read basic texts and inscriptions. Focus
is on the legacy of the ancient Egyptian language and Egyptian texts to the classical world and beyond.

3-4 units, given 2001-02

2. Introduction to Coptic—The Coptic language is the final stage of ancient Egyptian. It is a key language for the study of early Christianity and the survival pagan culture in Egypt, and the key to the decipherment of the Rosetta Stone and Egyptian hieroglyphic writing. Emphasis is on basic grammar and, as time permits, some important literatures preserved in Coptic (the New Testament and the "Saying of the desert fathers").

3-4 units, given 2001-02

8. Ancient Policies: Practices of Citizenship in Greece and Rome—It is common, especially in the U.S., to hear complaints about the decline of civic identity and the demise of the responsible citizen. What do these phases mean? How do we define the ideal citizen? The theoretical and practical debates over the virtues, responsibilities, and risks of citizenship in a range of ancient texts: ancient drama, political speeches, Plato’s Republic, Aristotle’s Politics, Cicero’s treaties on government, Plutarch’s biographies, and a section of readings on ancient education. Readings in English.

3-4 units, Win (Connolly)

12. Greek Tragedy—The tragedies produced in 5th-century Athens represent a moment in the history of human creativity. Twelve plays by Aeschylus, Sophocles, and Euripides are studied with Aristotle’s Poetics and Aristophanes’ Frogs. Emphasis is on the range and depth of Greek tragedy, the power and complexity of the poetry, the connections to 5th-century social and political issues, and the performance conditions and conventions of the ancient theater. GER:3b (DR:9)

3-5 units, Spr (McCall)

18. Greek Mythology—The heroic and divine in the literature, mythology, and culture of archaic Greece. Interdisciplinary approach to the study of individuals and society. Illustrated lectures. Selected readings, in translation, of Homer, Hesiod, Herodotus, and the poets of lyric and tragedy. GER:3a (DR:8)

3-4 units, Spr (Syed)

22N. Stanford Introductory Seminar: Technologies of Civilizations, Writing, Number, Money—Preference to freshmen. For 5,000 years, civilization has been growing at an exponential rate. The keys to this growth were the technologies of civilization, writing, number, and money, enabling the creation of complex societies and enhancing human cognition itself. Focus is on the role of cognition in shaping history and the role of history in shaping cognition. The perspective is global, emphasizing Western tradition and its ancient Greek roots. GER:3b (DR:9)

3-4 units, Aut (Netz)

23N. Stanford Introductory Seminar: Cross Cultural Perspectives of Love—Preference to freshmen. Love and its accompanying gender dynamics are examined from a variety of perspectives and in different historical and cultural contexts. Texts: ancient Roman poetry, Ovid’s poem the Art of Love, Choderlos de Laclos’ novel Dangerous Liaisons, Plato’s Symposium, Freud’s theory of love, Jessica Benjamin’s The Bonds of Love, and Foucault’s History of Sexuality. The relative merits of theoretical vs. literary accounts of love, the concept of romantic love and women’s desire, the cultural roots of romantic love in contemporary society, its cultural boundaries and its underlying gender organization. GER:3a,4c (DR:8f)

3-4 units, Aut (Syled)

30Q. Stanford Introductory Seminar: Literature and Culture of Modern Greece—Preference to sophomores. Focus is on modern Greece since its establishment as a nation. Literary works of prominent authors, films, and documents highlight issues related to Greek institutions, social structures, traditions, and culture. Emphasis is on topics of ethnicity, Greek heritage and national identity, kinship and gender issues, and migration patterns.

3-5 units, Aut (Prionas)

116/216. Eros, Mathematics, and Reality: Reading of Plato—Two routes led Plato into higher reality: Eros (Symposium, Phaedrus) and mathematics (Republic, Timeaus). By following the two routes we understand what Plato’s higher reality was like. GER:3b (DR:9)

3-4 units, Win (Netz, Moravscik)

117. Gender, Violence, and the Body in Ancient Religion—How did the Ancient Greeks organize their communal response to family conflict, political compensation, war, marriage and death? What was it like to live in a city where all those responses were organized along gender lines? Tragedies and comedies from ancient Athens, and the writings of some ancient philosophers, poets, and modern thinkers are explored to understand how a sophisticated pre-technological people used religious ritual to maneuver within a strictly segregated sex-gender system that simultaneously exacerbated the psychic tensions of social life, and afforded them some measure of healing. GER:4c (DR:†)

3-4 units, Aut (Gleason)

119. Gender and Power in Ancient Rome—GER:3a,4c (DR:8f)

3-4 units, Win (Stephens)

130. Singers of Tales: Ancient and Contemporary Epic in Action—Epics from four contemporary non-Western cultural areas help to understand the ways in which this social poetry reflects and molds the thinking of its audiences and practitioners in many parts of the world today. The content and varied methods of epic performance in Egypt, among the Nyanga of Africa, in Central Asia, and in north and central India. Emphasis is ethnographic and aesthetic: on the epic as crafted, meaning-rich performances, and on the role of such performances in the everyday life of common people. GER:3a,4a (DR:2 or 8)

3-4 units, Aut (Martin)

133. Invention of Science—Does science have to be the way it is? Does it have to be at all? Science as we know it was created in the ancient Greek world. The Greeks invented powerful concepts such as Nature and Rationality, and Proof, and the Greeks created a whole range of fields from biology to geometry. The Chinese had a separate invention of science. The two are compared and assessed to the extent to which contemporary science is still "Greek science." GER:3b (DR:9)

3-4 units, Aut (Netz)

139. Medicine in Ancient Greece and Rome—Contemporary medical practice traces its origins to the creation of “Scientific Medicine” by Greek doctors, e.g., Hippocrates and Galen. Is this something modern medicine can be proud of? The scientific achievements and the ethical limitations of ancient medicine are compared. Contemporary ideas and practices that had their beginning in the ancient world, a world where “scientific medicine” was no more than another form of “alternative medicine.” Scientific medicine had to compete in the marketplace of ideas, struggling to be recognized where the boundaries between the scientific and social aspects of medicine were difficult to draw. This background for the creation of modern medicine helps us understand better the interaction between medicine and society in our own culture. 4 units, given 2001-02

169. Introduction to the Ethics of Socrates, Plato, and Aristotle—The ethical philosophies of Socrates, Plato, and Aristotle, and its relation to traditional Greek notions of goodness and happiness. The ideological systems (gender, sexuality, race, and class) which these thinkers set out to corroborate or contest. The nature of philosophic language and its relation to other kinds of discourse (especially poetry and rhetoric).

4-5 units, given 2001-02

176. Majors Seminar: Interpreting Antiquity—The literary history of Greek and Roman poetry. Discussions of epic, lyric and dramatic texts
32A,B. Serious Laughter, Fantasy, and Invective in Ancient Greece
—(Enroll in Introduction to the Humanities 32A,B.) and Beyond
—(Enroll in Introduction to the Humanities 31A,B. Ancient Empires
is an interesting literary and historical study. Students explore Horace's Odes
influenced by ideas in prescribed school texts, e.g., the Civil Service depended heavily on success in examinations in Latin, was
influenced by ideas in prescribed school texts, e.g., the
Odes of Horace. Horatius Flaccus, son of a freedman and on the wrong side at Philippi, and his admirer Rudyard Kipling, a myopic journalist excluded from
athletic or military pursuits, are unlikely prophets of empire. Kipling refers to Horace throughout his life as a writer, often parodies him, and was one of those responsible for the spoof "fifth book of Horace's Odes.
The "dialogue" between the two about defeat, victory, and right conduct is an interesting literary and historical study. Students explore Horace's Odes (in translation) and a selection of Kipling's writings in prose and verse. GER:3a (DR:8)
3-4 units, Win (Treggiari)

31A,B. Ancient Empires—(Enroll in Introduction to the Humanities 31A,B.)
5 units, Win (Morris)
Spr (Trimble)

32A,B. Serious Laughter, Fantasy, and Invective in Ancient Greece and Beyond—(Enroll in Introduction to the Humanities 32A,B.)
4-5 units, Win (Martin)
Spr (Connolly)

101A. Reading Tutorial in History—In Greek.
3-4 units, any quarter (Staff)

102. Roman History I: The Republic—How did Rome grow from a village to the capital of a Mediterranean empire? The underlying factors of culture, customs, and structures of Rome in the context of a world of tribes and city-states. GER:3a (DR:8)
4-5 units, Win (Treggiari)

103. Roman History II: The Empire—The Roman Empire from the dictatorship of Julius Caesar and the Principate of Augustus through the consolidation of the system and the brink of its later crisis. Emphasis is on the achievement of Augustus in establishing a constitutional system, the Principate, which gave relative peace and security to the Roman world for 250 years; the subsequent history of the Julio-Claudian dynasty; the life and culture of the empire (Mediterranean lands and Europe) during the first two centuries A.D.; and the contribution of Rome to the cultures of western Europe and its successors (e.g., literature, architecture, law, the transmission of Greek and Judeo-Christian ideas, and the acculturation of Romans to non-Romans and the non-transmission of Roman culture elsewhere). Contemporary texts and archaeological data where possible. GER:3a (DR:8)
4-5 units, Spr (Treggiari)

105. History and Culture of Egypt—Survey of the history and culture of ancient Egypt from the pre-dynastic, 3100 B.C., through the early Christian period, A.D. 500. Emphasis is on historical development and continuity and the contribution of Egyptian culture to other Mediterranean societies. GER:3a,4a (DR:2 or 8)
4-5 units, Spr (Manning)

108A. Reading Tutorial in Late Antiquity—In Greek or Latin.
3-4 units, any quarter (Staff)

180. The Logic of History—How can we understand the human past? Ideas have changed so much in the past 30 years that some critics suggest that we no longer write history. How do historians advance and sustain arguments? What is historical evidence, and how do historians make sense of it? What rules of argument apply in different kinds of history and how do these differ from those found in other parts of the social sciences and humanities? What is historical truth? Can we ultimately make sense of the past? GER:3a (DR:8)
5 units, Win (Morris)

19N. Stanford Introductory Seminar: Horace, Kipling and Imperialism, Songs, and Law—Preference to freshmen. British thinking about empire in the 19th century, when admission to the army and the Indian Civil Service depended heavily on success in examinations in Latin, was influenced by ideas in prescribed school texts, e.g., the Odes of Horace. Horatius Flaccus, son of a freedman and on the wrong side at Philippi, and his admirer Rudyard Kipling, a myopic journalist excluded from athletic or military pursuits, are unlikely prophets of empire. Kipling refers to Horace throughout his life as a writer, often parodies him, and was one of those responsible for the spoof "fifth book of Horace's Odes.
The "dialogue" between the two about defeat, victory, and right conduct is an interesting literary and historical study. Students explore Horace's Odes (in translation) and a selection of Kipling's writings in prose and verse. GER:3a (DR:8)
3-4 units, Win (Treggiari)

129. Materials in Archaeology and their Survival—Archaeological artifacts from Old and New World antiquity are most often found in ceramic, stone, metal, glass, textiles, wood products, bone, and related organisms. Artifacts may be in composite forms of multiple materials, studied with the appropriate technology to produce selected artifacts and the long-term characterizations through durability, workability, availability, etc. The survival of each material is examined in the context of environmental factors that enhance or detract from preservation and in the presence of water, heat, temperature, oxidation, etc. Weekly labs and workshops.
3-4 units, Win (Treggiari)

100A/200A. Archaic Greek Art—(Same as Art and Art History 101/301.)
4 units, Aut (Hunt)

100B/200B. Classical and Hellenistic Greek Art—(Enroll in Art and Art History 102/302.)
4 units, Win (Maxmin)

100C/200C. Roman Art—(Same as Art and Art History 104/304.)
4 units, Spr (Maxmin)

202C. Colloquium: Aspects of Later Greek Art—(Same as Art and Art History 201.)
4 units (Maxmin) not given 2000-01

INDIVIDUAL STUDY
These courses have department prefix 378.

160. Directed Reading (Undergraduate)
1-15 units, any quarter (Staff)

199. Undergraduate Thesis
6-10 units, any quarter (Staff)

260. Directed Reading (Graduate)
1-15 units, any quarter (Staff)

360. Dissertation Research
1-15 units, any quarter (Staff)
GRADUATE SEMINARS

Graduate seminars vary each year. The following are given this year.

ANTICENT HISTORY [371]

300. The Problem of the East in Archaic Greece—Around 1000 B.C., Greece was virtually cut off from Egypt and the Near East; three centuries later, every aspect of Greek life was permeated by the east, and a full blown "orientalizing" movement was underway. Emphasis is on the poetry, archaeology, and art history of archaic Greece. Why were the archaic Greeks so bitterly divided over the meanings of the east and its place in the good society? Why has the question of the relationships between the Greeks and the east caused such anxieties among modern scholars? Methodological questions are raised about how to analyze and integrate material and textual data, and theoretical questions about how to ground discursive conflicts in material forces.

4-5 units, Spr (Morris)

389. Approaches to Roman History, Cicero—Open to Ph.D. candidates from other departments, advanced Classics majors, and others. Introduction to the subject matter, problems, and methods of Roman historians. Student presentations (orally and in writing) are chosen in the light of their interests and previous experience with some focus on texts that form part of the Classical reading list and on preparation for the General Examination. Emphasis is on the letters and speeches of Cicero from c. 68 to c. 49 B.C. Texts in Latin, translation, or both.

4-5 units, Spr (Treggiari)

ART AND ARCHAEOLOGY [372]

300. The Problem of the East in Archaic Greece—See Ancient History above.

4-5 units, Spr (Morris)

305. Corinth: A Case Study in Archaeology—The case study of a Greek city state of the mid-1st millennium B.C. is used to explore effective research design and implementation in archaeology. Corinth provides a detailed and substantive introduction to the early years of the city and state in the Mediterranean, while its study provides models of source criticism, archaeological survey and fieldwork, and the interpretation of material culture. Emphasis is on the articulation of theory and practice and complementary use of cross-disciplinary quantitative and qualitative methodologies.

4-5 units, Spr (Sanks)

306. Archaeologies of the Contemporary Past—Traces of the past are all around us. They are growing in significance as sources of security and identity, personal and cultural. What is being done with the remains of the past? Topics: collections (museums, antiques, memorabilia); time, ruin, and the modern imagination; photography; forensic science; metaphors of depth, traces and excavations; tourism and the culture industry; the anthropology of everyday life. Case studies in museum interpretation, battlefield archaeology, oral history, autobiography, walking and rambling, tour guides and travel writing, land art, experimental theater, the analysis of garbage, gothic fiction, and polar exploration.

5 units, Win (Shanks)

307. Art and Text in the Roman World—Roman culture was profoundly shaped by stories and symbolic frameworks articulated and experienced through visual images, ritual, text, spectacle, and performance. Scholars have access to this world primarily through written sources and visual imagery, but disciplinary divides mean that these are difficult to juxtapose with rigor or depth. The relationship of text and art is examined in terms of collective knowledge among makers and audiences, shared structural features, and issues of audience. Potential themes: visual and textual literacies, aesthetics, narrative, cultural identity and politics, memory and appropriation.

5 units, Win (Trimble)

GREEK [373]

300. Poetics of the Iliad—Focus is on selected books of the poem in Greek (1, 3, 6, 9, 10, 11, 16, 18, 24) while reading the entire poem in English. Emphasis is on learning in detail Homeric conventions of verse-making, scene-construction, characterization, and motif, and applying these to the interpretation of the poem. The relationships of Homeric epic to Cyclic material; inter- and intratextuality; the definition of the formula, the textual transmission of the poem as it affects our knowledge of conventions; traditional referentiality; myth, ritual, and poetry interconnections.

5 units, Aut (Martin)

301. Greek Religion: The Public Record—Studying Greek writing in the service of religion: dedications, monuments, markers of sacred boundaries, sacrificial calendars, purification rules, sacred inventories, prescriptions and records of festivals, gold tablets to accompany the dead, etc.

5 units, Win (Jameson)

LATIN [375]

307. The Augustan Age

5 units, Win (Barchiesi)

GENERAL [378]

306. The Problem Plays in Greek Tragedy—Four plays, Sophocles' Electra and Philoctetes, and Euripides' Alcestis and Electra, have differences of interpretation so vast as to be chaotic. Some parts of the texts are selected, practicing textual criticism. Discussions and debates on the meanings of the plays, and formulating the key issues in these magnificent but elusive dramas.

5 units, Win (McCall)

AFFILIATED DEPARTMENT OFFERINGS

COMPARATIVE LITERATURE

314. Epic and Empire

5 units, Spr (Parker)

CULTURAL AND SOCIAL ANTHROPOLOGY

137. Introduction to Skills in Archaeology

5 units, Spr (Hodder)

259. Approaches to the Body

5 units, Spr (Hodder)

273. Introduction to Archaeological Theory

5 units, Aut (Hodder)

COMMUNICATION

Emeriti: (Professors) Elie Abel, Richard A. Brody, Steven H. Chaffee, James Risser; (Professors—Teaching) Ronald Alexander, Marion Lewenstein

Director, Institute for Communication Research: Donald F. Roberts

Director, John S. Knight Fellowships for Professional Journalists: Jim Bettinger

Director, Documentary Film and Video: Jan Krawitz

Director, Journalism: Theodore L. Glasser

Deputy Director, John S. Knight Fellowships for Professional Journalists: James R. Bettinger

Professors: Henry S. Breitrose, Theodore L. Glasser (on leave Spring), Shanto Iyengar, Jan Krawitz, Clifford I. Nass, Byron B. Reeves, Donald F. Roberts

Assistant Professors: François Bar (on leave Autumn), Laura Leets (on leave Autumn)

Professor (Teaching): James Bettinger

Lecturers: Vivian Kleiman, Jay Rosenblatt, James Wheaton

Visiting Professors: Dale Maharidge, James Potter, William Woop
The Department of Communication engages in research in communication and offers curricula leading to the A.B., A.M., and Ph.D. degrees. The A.M. degree prepares students for research on mass media or for careers in journalism or documentary film and video. The Ph.D. degree leads to careers in teaching and research-related specialties.

The Institute for Communication Research offers research experience primarily to advanced Ph.D. students.

The John S. Knight Fellowship Program brings promising mid-career professional journalists to the University to study for nine months in a nondegree program. Six International Fellows are sponsored by the Knight Foundation, the Knight Foundation, and others join twelve U.S. journalists.

ADMISSION

Prospective Undergraduate Students—Write to the University's Office of Undergraduate Admissions, Stanford University, Stanford, California 94305.

Prospective Graduate Students—Write to the Registrar's Office, Stanford University, Stanford, CA 94305-3005. Online applications are also readily available via the web at http://www.applyweb.com/aw/stanford.

The department requires that applicants for graduate admission submit verbal and quantitative scores from the Graduate Record Examination (GRE). Admission to each graduate degree program is competitive based on the pool of applicants each year rather than on standard criteria that can be stated in advance.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

PREPARATION

Before declaring the major, students must have completed or be concurrently enrolled in two of the following courses: Communication 1, 106 or 108; and Statistics 60 or Psychology 10. Students interested in declaring the major should see peer advisers or the Student Services Administrator in Building 120, room 434 during the scheduled office hours.

PROGRAM OF STUDY

The undergraduate curriculum is intended for liberal arts students who wish to develop a fundamental understanding of communication in society, drawing on the perspective of the social sciences. Undergraduate students majoring in communication are expected to become acquainted with the fundamental concerns, theoretical approaches, and methods of the field, and to acquire advanced knowledge in one or more of the subareas of communication institutions, processes, and effects.

While the department does not attempt to provide comprehensive practical training at the undergraduate level, the curriculum provides opportunities for professional print journalism as well as internships opportunity.

The department is committed to providing students with the analytical and critical skills that are necessary for future success, be it in graduate programs, professional schools, or immediate career entry.

The major is structured to provide several levels of study: a core curriculum, intended to expose students to a broad-based understanding of communication theory and research, and a number of intermediate-level options and electives. Majors also have the opportunity to do advanced research in the form of senior projects and honors theses.

All undergraduate majors are required to complete a set of core Communication courses which include 1, Mass Communication and Society (5 units); 141A or 141B, History of Film (WIM, 5 units), 106, Communication Research Methods (5 units); and 108, Communication Process and Effects (5 units).

Students must also complete an introductory course in statistics (typically Psychology 10 or Statistics 60) in preparation for courses in methodology and advanced courses in communication processes and effects. It is recommended that this be done as soon as possible so as not to prevent registration in a course requiring statistical understanding.

In addition to the core courses and the statistics requirement, undergraduate majors select courses from the areas described below. Many of the courses require core courses as prerequisites.

Area I: Communication Processes and Effects—Area I emphasizes ways in which communication scholars conduct research in, and consider the issues of, human communication. These studies aim to provide expert guidance for social policy makers and media professionals. A minimum of two courses must be taken from Communication 127, 130, 137, 155, 160, 162, 166, 169, 170, 172.

Area II: Communication Systems/Institutions—Area II considers the roles and interaction of institutions such as broadcasting, film, journalism, constitutional law, and business within communication and mass communication contexts. A minimum of two courses must be taken from Communication 116, 122A or B, 125, 144F, 131, 133, 141A or B, 142, 178, 183.

Tracks—The communication curriculum is designed to provide a theoretical base that can be effectively applied to numerous environments. The potential tracks listed below are not required, but are examples of how to focus your interests.

1. Communication Technologies
   a) Department of Communication:
      137. U.S. Communication Policy
      166. Communication Policy in Comparative Perspectives
      169. Communication, Technology, and Society
      172. Psychological Processing
      183. Media Economics
   b) Affiliated department offerings (elective credit toward the major):
      1) Computer Science (CS)
      CS 105. Introduction to Programming (HTML and JavaScript)
      CS 147. Introduction to HCI
      CS 247A. Interaction Design Studio
      CS 201/STS 215. Computers Ethics and Social Responsibility
   2) Science, Technology, and Society (STS)
      STS 101. Science, Technology, and Contemporary Society
      STS 163. Sciences of the Mind, Post-WW II

2. Communication and Public Affairs
   a) Department of Communication
      137. U.S. Communication Policy
      125. Perspectives on American Journalism
      130. Language and Interpersonal Communication
      133. Communication and Culture
      155. Interracial Communication
      160. The Press and the Political Process
      170. Communication and Children
      183. Media Economics
   b) Affiliated department offerings (elective credit toward the major)
      1) Political Science
      101P. Politics of Public Policy
      184. Issues of Representation in American Politics
   2) Department of Psychology
      142. Social Development
      161. Cultural Psychology
      167. Seminar on Aggression
      180. Social Psychological Perspectives on Stereotyping and Prejudice
   3) Public Policy Program
      104. Economics and Public Policy
      194. Technological Policy

3. Media Practices and Performance
   a) Department of Communication
      122A or B. Documentary Film
      125. Perspectives on American Journalism
      131. Media Ethics and Responsibilities
      141A or B. Film History
      142. Broadcasting in America
      160. The Press and the Political Process
      178. Newsroom Management
The remainder of the 60 required units may be fulfilled with any elective communication courses, or cross-listed courses in other departments.

To be recommended for the A.B. degree in Communication, the student must complete at least 60 units (approximately twelve courses) in the department. No more than 10 units of transfer credit or Summer Session may be applied to meet department requirements. Communication majors must receive a letter grade for all communication courses unless they are offered only for satisfactory/no credit (S/NC).

**Internship Opportunities**—Internship credit is available for Communication undergraduates and minors. For communication majors/minors interested in Journalism internships, select the "Internship Office" (http://www.stanford.edu/dept/communication/) for current internship possibilities. Communication students who have received academic credit for internship experience through Communication 185 have prepared reports, which are available in the Communication Library.

**MINORS**

**PREPARATION**

Before declaring the minor, students must have completed or be concurrently enrolled in two of the following courses: Communication 1, 106 or 108; and Statistics 60 or Psychology 10. Students interested in declaring the minor should launch the registrar’s website (www-leland.stanford.edu/dept/registrar/) to apply for the minor.

**PROGRAM OF STUDY**

The minor is structured to provide a foundation for advanced course work in communication through a broad-based understanding of communication theory and research.

The minor in Communication consists of three introductory Communication core courses which include 1, Mass Communication and Society (5 units); 106, Communication Research Methods (5 units); and 108, Communication Process and Effects (5 units).

In addition to core courses, the minor requires a minimum of five intermediate-level elective courses in the department. The department also requires completion of or concurrent registration in an introductory statistics course (Statistics 60, 70, or Psychology 10) prior to registration in Communication 106, Communication Research Methods. It is strongly recommended that the course in statistics be taken as early as possible, preferably in the Autumn Quarter of the junior year.

Students interested in declaring a minor must do so no later than registration day in the Autumn Quarter of the junior year. Core courses are offered only once annually, and they constitute a sequence:

Prerequisite: introductory statistics course (for example, Psychology 10)

Core Courses: Communication 1, 106, 108
Area I, Communication Processes and Effects. A minimum of one course from Communication 127, 130, 137, 155, 160, 162, 166, 169, 170, 172
Area II, Communication Systems and Institutions. A minimum of one course from Communication 116, 122A,B, 125, 131, 133, 141A,B, 142, 178, 183

Plus three elective courses

Some courses are not offered every year. Refer to program handout and the Time Schedule for details.

**HONORS PROGRAM**

The honors program provides undergraduates the opportunity to undertake a significant program of research in an individual professor/student mentoring relationship. The aim is to guide students through the process of research, analysis, drafting, rethinking, and redrafting, which is essential to excellence in scholarship. Working one-on-one with a faculty adviser, seniors may earn between 5 and 15 Communication units, culminating in an honors thesis. In order to be eligible for the honors program, interested majors must have: (1) successfully completed both a research methods and statistics course, (2) selected an adviser, and (3) submitted an application to the department by the end of their junior year. Applications may be picked up outside of room 110 of Building 120.

A final copy of the honors thesis must be read and approved by the adviser and submitted to the department by the eighth week of Spring Quarter (exact date to be arranged). It becomes part of a permanent record held by the department. Honors work may be used to fulfill Communication elective credit but must be completed and a letter grade submitted prior to graduation. A student failing to fulfill all honors requirements may still receive independent study credit for work completed and it may be applied toward fulfilling major requirements.

The designation "graduation with honors" is awarded by the Department of Communication to those graduating seniors who, in addition to having completed all requirements for the Communication major:

1. Complete an honors thesis
2. Maintain a distinguished grade average in all communication course work
3. Are recommended for distinction by the Communication faculty

**COTERMINAL PROGRAM**

The Department of Communication offers students who are completing an A.B. in another department, a coterminal program with an A.M. emphasis in Media Studies (see Media Studies Program below for more information); applications can be picked up at Degree Progress, the Registrar’s Office, room 132, Old Union.

Applications for coterminal study must be submitted at least four quarters in advance of the expected master’s degree conferral date. Stanford undergraduates may apply as early as the eighth quarter (or upon completion of 105 units), but no later than the eleventh quarter of undergraduate study. Requirements include: Application for Admission to Coterminal Master’s Program form, preliminary program proposal, statement of purpose, three letters of recommendation from Stanford professors, and a current Stanford transcript. GRE scores are no longer required. Coterminal applications are submitted directly to the department. Review procedures and the Graduate Admissions Committee determines criteria.

**GRADUATE PROGRAMS**

**MASTER OF ARTS**

University requirements for the master’s degree are described in the “Graduate Degrees” section of this bulletin.

The department awards terminal A.M. degrees in Journalism and Documentary Film/Video. Applicants for each program, and for doctoral work, are evaluated for admission on different criteria. A student may complete more than one A.M. degree in the department, but course work applied to the requirements for one A.M. degree may not be applied to a second. All work to fulfill graduate degree requirements must be in courses numbered 100 or above.

Students who complete an A.M. degree and who desire entry into the Ph.D. program must file a Graduate Program Authorization Petition application, which can be picked up at Graduate Degree Progress, room 132, Old Union. Such students are considered alongside all other doctoral applicants.

**DOCUMENTARY FILM AND VIDEO**

The graduate program in documentary film and video is a master's program designed to train students in the conceptual and craft skills for the production of nonfiction film and video.

**RESIDENCY**

The program requires continuous enrollment for a period of two academic years, with a completion date of June in the second year.

Students proceed through the program as a cohort. The degree requires three full terms of registration in the first year. In the second year, full-time registration is required in Winter Quarter, with half-time registration in the other remaining two quarters. Full-time registration consists of a minimum of 11 units; half-time registration consists of 9 units. The residency requirement is calculated on the basis of terms of registration and not on the basis of total number of units earned. The program does not allow for leaves of absence.
The curriculum is intended to teach an array of technical and conceptual skills as well as relevant historical and theoretical knowledge.

First-Year Curriculum

Autumn Quarter

- 200. Media Narrative
- 202A. Graduate Colloquium in Film and Television
- 223A. Documentary Film/Video Directing I
- 224A. Film Production I

Winter Quarter

- 202B. Graduate Colloquium in Film and Television
- 223B. Documentary Film/Video Directing II
- 224B. Film Production II

Spring Quarter

- 222A. Documentary Film
- 222B. Documentary Film
- 223C. Documentary Film/Video Directing III
- 224C. Film Production III

Elective (3-5 units)

Second-Year Curriculum

Autumn Quarter

- 202A. Graduate Colloquium in Film and Television
- 292A. Documentary Film/Video A.M. Project Seminar I

Winter Quarter

- 202B. Graduate Colloquium in Film and Television
- 292B. Documentary Film/Video A.M. Project Seminar II

Spring Quarter

- 202C. Graduate Colloquium in Film and Television
- 292C. Documentary Film/Video A.M. Project Seminar III

Electives

Up to three electives may be from Department of Communication courses, including the required two-course sequence of documentary history classes taken in the Autumn Quarter of the first and second year. Some elective courses are not offered every year, and there may be time conflicts with core courses. Students should consult the University Time Schedule each quarter for current information.

Each term, courses that are relevant to the curriculum may be offered by other departments at Stanford. At least one elective must be taken outside the department. A list of approved electives, both within and outside the department, is provided each quarter. Other electives relevant to the subject matter of the A.M. project may be substituted, with permission of the adviser.

Equipment and Supplies

The department maintains film and video production facilities for teaching and research purposes. However, the costs of supplies and processing services are the responsibility of the students.

Material costs are approximately $1,800 for the first year of residence. In the second year, costs vary depending on subject, format/length, and logistics, but $3,000-5,000 is typically the minimum average cost of an A.M. project.

A.M. Project

In the second year of the program, each student produces an A.M. project which consists of a 15-20 minute film or video documentary. In order for students to have sufficient time to complete their own A.M. projects and gain the experience of assisting others, shooting must begin prior to Thanksgiving break, and shooting days are limited to a total of ten.

Students own their own work, but the department reserves the right to use student projects for non-profit University-related purposes.

In order to graduate, students must deposit with the faculty adviser Beta SP and VHS copies of their film or video project and a revised final budget that reflects the projected and actual cost of their production. In the case of film, the Beta SP copy must be made once the film is printed and in the case of video, the Beta SP copy must be made from the on-line master. Students must contact the department's Student Services Administrator during the quarter in which they expect to graduate in order to determine what needs to be done to file for graduation. Students working in film may not have completed their final printing work prior to the end of the Spring Quarter. It is therefore possible for a student to officially graduate in the Summer Quarter immediately following their enrollment in Communication 292C, although they will not have access to facilities during this period. No extensions or leaves of absences are granted.

All A.M. projects must be completed by the end of the Spring Quarter of the second year. In the case of video, the student must have completed on-line editing, and in the case of film, the student must have completed the final sound mix. The A.M. projects are screened for the public during Commencement weekend.

Journalism

Stanford's Graduate Program in Journalism focuses on the knowledge and skills required to report, analyze, and write authoritatively about public issues. The curriculum combines a sequence of specialized reporting and writing courses with seminars and courses devoted to deepening the students' understanding of the roles and responsibilities of American news media in their coverage of public issues.

The program emphasizes both rigorous preparation for the practice of journalism as well as a critical perspective from which to understand it. The program's objective, then, is twofold: (1) to graduate talented reporters and writers who will foster public understanding of the significance and consequences of public issues and the debates they engender; and (2) to graduate thoughtful journalists who will respond openly and eloquently when called on to explain and defend the methods of their reporting and the quality of their writing.

Curriculum

The curriculum includes eight required courses, including a master's project:

- 215. Journalism Law
- 217. Journalism and the Internet
- 225. Perspectives on American Journalism
- 250. The Press and the Political Process
- 273. Public Issues Reporting I
- 274. Public Issues Reporting II
- 289. Journalism A.M. Project
- 291. Graduate Journalism Seminar

Additionally, students are required to take two specialized writing courses, typically one each during Winter and Spring quarters; one or two approved electives from among graduate-level courses in the Department of Communication; and one or two approved electives from among courses on campus that deal substantively with issues of public importance. The A.M. degree in communication (journalism) requires 51 units.

A typical schedule follows:

Autumn Quarter

- Public Issues Reporting I
- Perspectives on American Journalism
- Journalism Law
- Graduate Journalism Seminar
- Elective

Winter Quarter

- Public Issues Reporting II
- Internet and the Newsroom
- Specialized Writing
- Graduate Journalism Seminar
- A.M. Project
- Elective

Spring Quarter

- The Press and the Political Process
- Specialized Writing
- Graduate Journalism Seminar
- A.M. Project
- Elective

Journalism Project

The master's project, a requirement for graduation, is intended as an opportunity for students to showcase their talents as writers and reporters. It is also an opportunity to undertake an in-depth critique of an area of journalism in which the author has a special interest. Work on the project usually begins during the Winter Quarter and continues through
MEDIA STUDIES

The Media Studies coterminous master’s program provides a broad introduction to scholarly literature in mass communication. This one-year program is designed for Stanford students without prior academic work in communication, who wish academic preparation for teaching. Media Studies students need to satisfy four basic requirements:

1. **Required Units and GPA:** students must complete 42 units in Communication and related areas, including items 2 and 3 below. Normally a grade point average (GPA) of 'B' (3.0) or better satisfies the requirement for high academic standing. To count toward the 42 units, courses in related areas outside the department must be approved by the student’s adviser.

2. **Core Requirements:** students must complete Communication 206, 208, and a statistics course. Typically, the statistics requirement is met with Statistics 160 or 190. Other courses occasionally are approved as substitutes. For example, in 1999-2000, Sociology 281 B satisfied the statistics requirement.

3. **Six Media Studies Courses:** students must complete a minimum of six additional Communication courses from the following list of department courses concerned with the study of media. While the department also offers graduate-level courses teaching media-related skills (for example, Communication 273 or 277), these courses are intentionally excluded from the list. Not all the listed courses are offered every year and the list may be updated from one year to the next. However, its intent is to include only courses in media studies, not media skills.

   - 201. Film Aesthetics
   - 211. Mass Communication and Society
   - 216. Media Law
   - 217. Journalism and the Internet
   - 225. Perspectives on American Journalism
   - 227. Media Violence
   - 230. Language and Interpersonal Communication
   - 231. Media Ethics and Responsibility
   - 233. Communication and Culture
   - 237. U.S. Communication Policy
   - 241. History of Film
   - 242. Broadcasting in America
   - 255. Interethic Communication
   - 260. Political Communication
   - 262. Analysis of Presidential Campaigns
   - 266. Communication Policy in Comparative Perspectives
   - 269. Computers and Interfaces: Psychological and Social Issues
   - 270. Communication and Children
   - 272. Psychological Processing of Media
   - 280. Film Criticism
   - 283. Media Economics
   - 318. Doctoral Research Methods II*
   - 319. Doctoral Research Methods III*

4. **Two Extensive Papers:** students complete papers in two of the required communication courses listed in item 3 above. The papers requirement is intentionally flexible to permit students to adjust it to their interests, in consultation with professors.

   a) Each paper must grow out of a communication course the student has taken.

   b) Papers must be supervised by a faculty member, typically the professor who taught the course that inspired the paper (but not necessarily the student’s adviser for the Media Studies program). Only a faculty member, not a Ph.D. student, can approve a topic and supervise a paper.

* These courses are designed for Ph.D. students. Master’s students are unlikely to be admitted to them, but the final decision is up to the faculty.

Additional courses are selected in consultation with an academic adviser. A course in statistical methods is strongly recommended.

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. are described in the “Graduate Degrees” section of this bulletin.

The department offers the Ph.D. in Communication Theory and Research. First-year students are required to complete introductory courses in communication theory and research, research methods, and statistics. These core courses are grounded in the social science literature emphasizing how people respond to communication and media and how media institutions function. In addition, Ph.D. students must complete a minimum of three literature survey courses and three advanced seminars in communication and related departments. Each student builds a research specialty relating communication to current faculty interests in such areas as children, ethics, ethnic identity, human-computer interactions, information processing, information technology, law, and politics and voting. Regardless of the area of specialization, the Ph.D. program is designed primarily for students interested in teaching and research careers or policy formation positions.

The Ph.D. program encompasses four years of graduate study (subsequent to completion of the A.B. degree) during which, in addition to fulfilling University residency requirements, Ph.D. candidates are required to:

1. Complete all departmental course requirements with above average graduate grades, normally defined as a minimum grade point average (GPA) of 3.5. Currently these courses include Communication 206, 208, 311, 317, 318, 319, and a sequence in statistics (for example, Statistics 160) that includes multiple regression and complex analysis of variables.

2. Pass the general qualifying examinations by the end of the second academic year of study and pass a specialized area examination by the end of the third academic year of study.

3. Demonstrate proficiency in tools required in the area of research specialization. Chosen with the advice of the faculty, such tools may include advanced statistical methods, computer programming, a foreign language, or other technical skills.

4. Complete two predissertation research projects.

5. Teach or assist in teaching at least two courses, including Communication 1.

6. Complete a dissertation satisfactory to an advisory committee of three or more faculty members.

7. Pass the University oral examination, which is a defense of the dissertation.

Because the multifaceted nature of the department makes it possible for the Ph.D. student to emphasize several areas of communication study, there tend to be several “typical” programs of course work followed by students, depending on their specialties. Variation in the course program occurs after the first year of graduate study; the first year is devoted primarily to the “core” courses required of all doctoral students.

In addition, students must complete other advanced Communication theory and research courses preparatory to their particular specializations. Specification of these courses depends on (1) individual student needs to prepare for preliminary and area examinations, and (2) the requirements of the particular area of emphasis chosen by the student.

Ph.D. candidacy is valid for five years. Extensions of candidacy are rarely granted and require reexamination.

Ph.D. MINOR

Candidates for the Ph.D. degree in other departments who elect a minor in Communication are required to complete a minimum of 20 units of graduate courses in the Department of Communication, including a total of three theory or research methods courses, and are examined by a representative of the department. A department adviser in consultation
with the individual student determines the particular communication
theory and methods courses.

THE INSTITUTE FOR COMMUNICATION
RESEARCH

The institute is an office of project research for the faculty of the
Department of Communication and operates under grants to faculty from
foundations, communication media, and other agencies. Research assis-
tantships are often available to qualified Ph.D. students in communica-
tion.

COURSES

(WIM) indicates that the course meets the Writing in the Major re-
quirements.

PRIMARILY FOR UNDERGRADUATES

1. Mass Communication and Society: Media Technologies, People,
and Society—(Graduate students register for 211.) Open to non-majors.
Introduction to the fundamental concepts and contexts of communica-
tion. A topics-structured orientation emphasizing the field and the scholar-
ly endeavors represented in the department. Lectures and discussion
sections. GER:3b (DR:9)
5 units, Aut (Nass)

101. Film Aesthetics—(Graduate students register for 201.) Theoreti-
cal, historical examination of the nature of the film medium. Emphasis
is on the problems of aesthetics and communication from the viewpoints
of practitioners, critic, and audience.
5 units (Breitrose) not given 2000-01

104. Reporting and Writing the News—Reporting and writing, em-
phasizing various forms of journalism: news, interpretation, features,
opinion. Detailed criticism of writing.
5 units, Win, Spr (Staff)

106. Communication Research Methods—(Graduate students register
for 206.) The conceptual and practical concerns underlying commonly
used quantitative approaches (experimental, survey, content analysis,
and field research) in communication. Students become acquainted with
the techniques of research so they may become intelligent consumers and
practitioners of research. Lectures and discussion sections. Recommended:
1 or Psychology 1.
5 units, Win, Spring (Leets)

108. Communication Process and Effects—(Graduate students regis-
ter for 208.) The process of communication theory construction, includ-
ing a survey of social science paradigms and major theories of commu-
nication. Lectures/discussion. Recommended: 1 or Psychology 1.
5 units, Aut (Potter)

113Q. Stanford Introductory Seminar: New Media—The Future of
the News—Preference to sophomores. News that sells you merchandise,
news written by reporters with stock options on producing news formats,
news that comes at you 24 hours a day via computer screen, pager, cell
phone: is this good or bad? Will these new media formats change how
you participate in democratic institutions? The instructor’s research on
how people read news online has tracked how user eyes move about
scrolling screens and move from site to site. Discussions on this research,
findings from other scholars, and possible participation ongoing re-
search. Students may tutor and record how different ethnic groups use
online news.
3-5 units, Win (Lewenstein)

116. Journalism Law—(See 216.)
5 units, Aut (Wheaton)

117. Journalism and the Internet—(Graduate students register for
217.) Preference to Communication seniors. The implications of new
media for journalists. Professional and social issues related to the Internet
as a case of new media deployment, as a story, as a research and reporting
tool, and as a publishing channel. Seminar discussion and hands-on
practicum. Prerequisite: consent of instructor.
5 units, Win (Bar)

122A. Documentary Film—(Graduate students register for 222A.)
Analysis of the techniques and strategies of films designed to effect
attitudinal and behavioral change. Prerequisite: consent of instructor.
5 units (Breitrose) alternate years, given 2001-02

122B. Documentary Film—(Graduate students register for 222B.)
Issues in contemporary documentary film/video including objectivity/
subjectivity, ethics, censorship, representation, reflexivity, responsibil-
ty to the audience, and authorial voice. The viewing and analysis of films
has a parallel focus on form and content. Prerequisite: consent of
instructor.
5 units, Win (Krawitz)

125. Perspectives on American Journalism—(Graduate students reg-
ister for 225.) Survey of issues, ideas, and concepts in the development
of American journalism, emphasizing the role of the press in society, the
meaning and nature of news, and professional norms that influence
conduct in and outside of the newsroom. Prerequisite: 1 or junior
standing. GER:3b (DR:9)
5 units, Aut (Glasser)

127. Media Violence—(Graduate students register for 227.) A critical
analysis of the existing knowledge base about violent content in the
media and the effects of exposure to that content immediately and over
the long term. The impact of the shortcomings of the research literature
on the development of policy.
5 units, Aut (Potter)

130. Language and Interpersonal Communication—(Graduate stu-
dents register for 230.) Theory and research regarding language and
interpersonal communication. Issues on the above in relationships (ini-
tiation, maintenance, deterioration); gender; persuasion; and deception
(use and detection).
5 units (Staff) not given 2000-01

131. Media Ethics and Responsibility—(Graduate students register
for 231.) The development of professionalism among American journalists,
emphasizing the emergence of objectivity as a professional and the
epistemological norm. An applied ethics course where questions of
power, freedom, and truth autonomy are treated normatively so as to
foster critical thinking about the origins and implications of commonly
accepted standards of responsible journalism.
5 units, Win (Glasser)

133. Communication and Culture—(Graduate students register for
233.) The relationship between communication and culture, emphasizing
the mass media and their symbolic import. GER:3b (DR:9)
5 units (Glasser) not given 2000-01

137. U.S. Communication Policy—(Graduate students register for
237.) Policy issues surrounding the emergence of a National Information
Infrastructure (NII) in the U.S. Adopting a pluri-disciplinary approach,
examines the historical context of the policy debate, the technical and
business aspects of the networking transformation underway, and its
economic and social dimensions. GER:3b (DR:9)
5 units, Win (Bar)

141A. History of Film: The First 50 Years—(Graduate students
register for 241A.) Studies in the development of the motion picture as
art form and cultural industry. Lab. Screenings of films announced in
class. GER:3b (DR:9) (WIM)
5 units, Win (Breitrose)
141B. History of Film: The Second 50 Years—(Graduate students register for 241B.) The evolution of the motion picture as an art form and culture industry in the U.S. and other nations from 1941. Topics: the decline of the studio system, the impact of WWII, the rise and fall of auteur cinema, television, industrial concentration and its effects, and the "high concept" film. Mandatory evening screenings. (WIM)
5 units (Breitrose) alternate years, given 2001-02

5 units, Spr (Breitrose)

144N. Stanford Introductory Seminar: Film Forum—Preference to freshman. The formal aspects of cinema, and in a general sense, with how form helps create meaning. A full understanding of a film, or any work of culture, is possible only when there is awareness of how it is constructed. The tools of construction are those formal elements of craft which taken together make the work cohere and make sense. In film, these tools are story, script construction, design, direction, acting, camera, sound, editing, and music.
1-3 units, Win (Breitrose)

149Q. Stanford Introductory Dialogue: Interethnic Communication—Preference to sophomore. Through case studies, students gain an understanding of the nature of interethnic relations and discuss effective ways for addressing the problems and issues associated with them.
2 units, Win (Leets)

155. Interethnic Communication—(Graduate students register for 255.) Working from an intergroup perspective, examines the influence of ethnicity on the process of interpersonal communication. The problems and opportunities inherent in communication among people from different ethnic heritages and value orientations, and the steps relevant for improving interethnic communication. GER:3b (DR:9)
5 units, Spr (Leets)

160. The Press and the Political Process—(Graduate students register for 260.) Analysis of the role of mass media and other channels of communication in political and electoral processes. GER:3b (DR:9)
5 units, Spr (Iyengar)

162. Analysis of Presidential Campaigns—(Graduate students register for 262.) Seminar on the evolution of American political campaigns, and the gradual replacement of the political party by the mass media as the key intermediary between candidates and voters. The academic literature on media strategies, the relationship between candidates and the press, the effects of campaigns on voter behavior, and current controversies concerning the apparent inconsistencies between media campaigns and democratic norms. Do media-based campaigns enable voters to live up to their civic responsibility? Has the need for well-financed campaigns increased the influence of elites over the nomination process? Have ordinary citizens gradually become disengaged because of their limited involvement in the process? Discussions are in the context of the 2000 campaign.
5 units, Aut (Iyengar)

166. Communication Policy in Comparative Perspectives—(Graduate students register for 266.) A comparative overview of the ongoing change in the communications policy environment of different countries. How different nations are tackling the transformation, the reasons for these differences, and the impact of distinct policy approaches on the respective national economies and societies. GER:3b (DR:9)
5 units (Bar) not given 2000-01

169. Computers and Interfaces: Psychological and Social Issues—(Graduate students register for 269.) Interdisciplinary approach to issues of human-computer interaction (primarily) and computers and society (secondarily). General models of the link between technology, psychology, and society, addressing the question of which is/are cause and which is/are consequence. Issues: anthropomorphism and interface design; what is a human; conversation and interfaces; metaphors in interfaces; identity, privacy, and computing; and computer-mediated communication. GER:3b (DR:9)
5 units, Win (Nass)

170. Communication and Children I—(Graduate students register for 270.) Developmental approach to how children come to use and process mass media, what information they obtain, and how their behavior is influenced by the media. Prerequisite: 1, Psychology 1, or Sociology 1.
GER:3b (DR:9)
4 units, Win (Roberts)

171. Communication and Children II—(Graduate students register for 271.) Research practicum; limited enrollment. Prerequisites: 170, consent of instructor.
3 units, Spr (Roberts)

172. Psychological Processing—(Graduate students register for 272.) The literature related to psychological processing and the effects of media. Topics: unconscious processing; picture perception; attention and memory; emotion; the physiology of processing media; person perception; pornography; consumer behavior; advanced film and television systems; and differences between reading, watching, and listening. GER:3b (DR:9)
5 units (Reeves) not given 2000-01

177. Specialized Workshops—(See 277.) One or more classes are offered in specializations such as science or opinion writing, or other areas, and are organized around writing projects oriented toward the field of specialization. Prerequisite: advanced Communication undergraduate.
4 units (Staff)

180. Film Criticism—(Graduate students register for 280.) A practical and critical view of film. Readings/discussion consider models of artistic and literary criticism as points of comparison. Weekly reviews stress the analysis of the films and a lucid writing style. Prerequisite: 101 or 141.
5 units, Spr (Breitrose)

183. Media Economics—(Graduate students register for 283.) The economics of communication media. A survey of the economic organization and characteristics of traditional communication sectors (newspaper publishing, film, broadcast and cable TV, telephony). The second half deals in detail with specific, cross-sector economic issues related to networks, media technologies, and digital convergence. Prerequisite: one completed Economics course.
5 units, Spr (Bar)

185. Internship Experience—Professional experience in the media. Prerequisite: Communication major.
1-4 units, Aut, Win, Spr (Staff)

190. Senior Project—Research project or production of a finished piece of work in journalism or film. A combination of the senior project and an internship is possible. Prerequisite: senior standing.
5 units, Aut, Win, Spr (Staff)

195. Honors Thesis—Qualifies students to conduct communication research.
5-15 units, Aut, Win, Spr (Staff)

199. Individual Work—Students with high academic standing are permitted to undertake individual work.
1-4 units, any quarter (Staff)
PRIMARILY FOR MASTER'S STUDENTS

200. Media Narratives—Required of all entering A.M. graduate students in communication. Narrative as a means of shaping the production and study of media. Lectures/discussions and projects on narrative form in research design, the web, journalism, and film and video production. Prerequisite: A.M. student in Communication

1-4 units, Aut (Reeves, Samuelson)

201. Film Aesthetics—Graduate section; see 101.

202A,B,C. Graduate Colloquium in Film and Television—Topics in film and television focusing mainly on production-related issues. Prerequisite: A.M. student in Communication in research design, the web, journalism, and film and video production.

1 unit, Aut (Krawitz)
Win (Samuelson)
Spr (Breitrose)

206. Communication Research Methods—Graduate section; see 106.
4 units, Win (Leets)

208. Communication Process and Effects—Graduate section; see 108.
4 units, Aut (Potter)

211. Mass Communication and Society—Graduate section; see 1.
4 units, Aut (Nass)

216. Media Law—Same as 116. Laws and government regulation impacting on journalists. Topics: libel, privacy, news gathering, protection sources, fair trial and free press, theories of the First Amendment, broadcast regulation, etc. Prerequisite: Journalism master students or advanced communication majors.

4 units, Aut (Wheaton)

217. Journalism and the Internet—Graduate section; see 117.
4 units, Win (Bar)

222A. Documentary Film—Graduate section; see 122A.
4 units (Breitrose) alternate years, given 2001-02

222B. Documentary Film—Graduate section; see 122B.
4 units, Win (Krawitz)

223A. Documentary Film/Video Directing I—For graduate students. Emphasis on conceptualizing and executing ideas for the production work done jointly with 224A, covering all aspects of preproduction at an introductory level. Prerequisite: admission to the A.M. Documentary Film and Video program.

5 units, Aut (Rosenblat)

223B. Documentary Film/Video Directing II—For graduate students. Further professional training in preproduction and producing for motion pictures and television. Interview skills and other documentary directing techniques are developed utilizing video. Prerequisite: 223A. Corequisite: 224B.

5 units, Win (Staff)

223C. Documentary Film/Video Directing III—For graduate students. Further examination of structure, emphasizing writing and directing the documentary. Practical training in fundraising and distribution. Prerequisite: 223B. Corequisite: 223C.

5 units, Spr (Samuelson)

224A. Documentary Film Production I—For graduate students. First of a three-quarter sequence leading to professional training in motion picture production. 16mm exercises and a short 16mm non-synchronous film with multiple sound tracks and effects. Corequisite: 223A.

5 units, Win (Krawitz)

224B. Documentary Film Production II—For graduate students. Produce a short 16mm film exercise in color utilizing synchronous sound, with emphasis on observational filming techniques. Prerequisites: 223A, 224A. Corequisite: 223B.

5 units, Win (Krawitz)

224C. Documentary Film Production III—For graduate students. Final quarter of professional training in motion picture production. A five- to seven-minute, 16mm film utilizing skills acquired in 224A,B.

225. Perspectives on American Journalism—Graduate section; see 125.
4 units, Aut (Glasser)

226. Reconstructing Documentary Theory—Seminar addressing current controversies in the theory of the documentary, drawing on the writings of Noel Carroll, Carl Plantinga, Leslie Woodhead, Trevor Ponek, Robert Rosenstone, etc. Topics: the rhetoric of non-fiction, the border between factual and fictional, subjectivity and objectivity, truth claims, reflexivity, and the "art documentary." Prerequisite: graduate standing or consent of instructor.

3-4 units (Breitrose) not given 2000-01

227. Media Violence—Graduate section; see 127.
4 units, Aut (Potter)

230. Language and Interpersonal Communication—Graduate section; see 130.
4 units (Staff) not given 2000-01

231. Media Ethics and Responsibility—Graduate section; see 131.
4 units, Win (Glasser)

233. Communication and Culture—Graduate section; see 133.
4 units (Glasser) not given 2000-01

237. U.S. Communication Policy—Graduate section; see 137.
4 units, Win (Bar)

241A. History of Film: The First 50 Years—Graduate section; see 141A.
4 units, Win (Breitrose)

241B. History of Film: The Second 50 Years—Graduate section; see 141B.
4 units (Breitrose) alternate years, given 2001-02

242. Broadcasting in America—Graduate section; see 142.
4 units, Spr (Breitrose)


4 units (Breitrose) not given 2000-01

255. Interethnic Communication—Graduate section; see 155.
4 units, Spr (Leets)

260. The Press and the Political Process—Graduate section; see 160.
4 units, Spr (Iyengar)

262. Analysis of Presidential Campaigns—Graduate section, see 162.
4 units, Aut (Iyengar)
266. Communication Policy in Comparative Perspectives—Graduate section; see 166.
   4 units (Bar) not given 2000-01

269. Computers and Interfaces; Psychological and Social Issues—Graduate section; see 169.
   4 units, Win (Nass)

270. Communication and Children I—Graduate section; see 170.
   4 units, Win (Roberts)

271. Communication and Children II—Graduate section; see 171.

272. Psychological Processing—Graduate section; see 172.
   4 units (Reeves) not given 2000-01

273. Public Issues Reporting I—Prepares students for the challenges of covering public policy issues and conveying their importance to the public by covering local and state governments and other institutions. The making of public policy, and the process of governmental decisions, including the impact of a variety of forces on government (e.g., public opinion, media attention, interest groups, labor unions, business lobbyists and campaign contributions).
   4 units, Aut (Woo)

274. Public Issues Reporting II—Student teams study one major public policy issue that has broad societal impact. Students report and write individually and as a team produce a body of journalism that advances policy issue that has broad societal impact. Students report and write individually and as a team produce a body of journalism that advances public by covering local and state governments and other institutions. The making of public policy, and the process of governmental decisions, including the impact of a variety of forces on government (e.g., public opinion, media attention, interest groups, labor unions, business lobbyists and campaign contributions).
   4 units, Win (Maharidge)

277. Specialized Workshops—(Same as 177.) One or more classes are offered in specializations such as science or opinion writing, or other areas, and are organized around writing projects oriented toward the field of specialization. Prerequisite: journalism master’s student.

277A. Opinion Writing
   4 units, Win (Woo)

277B. Science Writing

277D. Environmental Reporting

277F. Literary Journalism
   4 units, Spr (Bettiger)

277G. Social Issues Reporting
   4 units, Spr (Maharidge)

277M. Coverage of Medical Technology and Health Care Issues

280. Film Criticism—Graduate section; see 180.
   4 units, Spr (Breitrose)

283. Media Economics—Graduate section: see 183.
   4 units, Spr (Bar)

289. Journalism A.M. Project
   1 unit, Win (Staff)
   3 units, Spr (Staff)

290. A.M. Project
   4 units (Staff)

291. Graduate Journalism Seminar—Required of all students in the graduate program in Journalism. Meets throughout the year as a forum for discussion of current issues in the practice and performance of the press. Journalists in or visiting the Bay Area are guest speakers.
   1 unit, Aut (Glasser)
   Win (Woo)
   Spr (Maharidge)

292A,B,C. Documentary Film and Video A.M. Project Seminar—Focuses on the development, production, and postproduction of A.M. projects, and current issues in documentary film and video.
   6-8 units, Aut (Samuelson)
   Win (Staff)
   Spr (Krawitz)

299. Individual Work
   1-4 units, any quarter (Staff)

PRIMARILY FOR DOCTORAL STUDENTS

301. Communication Curriculum Development and Pedagogy—Required of all second-year Ph.D. students.
   1-3 units, Aut (Nass)

   1-3 units (Staff) not given 2000-01

311. Theory of Communication—Required of all communication doctoral students. Approaches to communication theory, seminar and tutorial meetings, and extensive reading and papers. Prerequisite: Communication Ph.D. student, or consent of instructor.
   4-5 units, Aut (Roberts)

317. Doctoral Research Methods I—Prerequisite: Ph.D. admission in Communication.
   4 units, Aut (Iyengar)

318. Doctoral Research Methods II—Prerequisite: 317.
   4 units, Win (Nass)

319. Doctoral Research Methods III—Prerequisite: 318.
   3-4 units, Spr (Leets)

330G. Seminar in Language and Interpersonal Communication—Limited to Ph.D. students. Advanced topics in language and interpersonal communication. Prerequisite: 230.
   1-3 units (Leets) not given 2000-01

331G. Seminar in Communication/Media Ethics—Limited to Ph.D. students. Advanced topics in press ethics and responsibility. Prerequisite: 231 or consent of instructor.
   1-3 units, Win (Glasser)

333G. Seminar in Communication and Culture—Limited to Ph.D. students. Advanced topics in communication and culture. Prerequisite: 233 or consent of instructor.
   3-4 units (Glasser) not given 2000-01

355G. Seminar in Intergroup Communication—Limited to Ph.D. students. Advanced topics in intergroup communication. Prerequisite: 255 or consent of instructor.
   1-3 units (Leets) not given 2000-01

360G. Seminar in Political Communication—Limited to Ph.D. students. Advanced topics in political communication. Prerequisite: 260 or consent of instructor.
   1-3 units, Win (Iyengar)

369G. Seminar in Communication, Technology, and Society—Limited to Ph.D. students. Advanced topics in communication, technology, and society. Prerequisite: 269 or consent of instructor.
   1-3 units (Nass) not given 2000-01
370G. Seminar in Communication and Children—Limited to Ph.D. students. Advanced topics in communication and children. Prerequisite: 270 or consent of instructor.
1-3 units, Spr (Roberts)

372G. Seminar in Psychological Processing—Limited to Ph.D. students. Advanced topics in psychological processing. Prerequisite: 272 or consent of instructor.
1-3 units, Spr (Reeves)

374G. Seminar in Structure and Control of Communication—Limited to Ph.D. students. Advanced topics in the structure and control of communication. Prerequisite: 273 or consent of instructor.
1-3 units (Glasser) not given 2000-01

3 units (Staff) not given 2000-01

379. Communication: History and Evolution of the Field—The history and current status of the field of communication research. Prerequisite: 273 or consent of instructor.
3-4 units (Staff) not given 2000-01

380A,B,C,D. Curriculum Practical Training—Practical experience in the communication industries. Prerequisites: graduate standing in Communication, consent of instructor.
1-3 units, Aut, Win, Spr, Sum (Staff)

3-6 units, Aut, Win, Spr (Staff)

398. Predissertation Research Project—Advanced research for Ph.D. candidates.
3-6 units, Aut, Win, Spr (Staff)

399. Advanced Individual Work
1-8 units, Aut, Win, Spr (Staff)

400. Dissertation Research
6-10 units, Aut, Win, Spr (Staff)

AFFILIATED DEPARTMENT OFFERINGS
See individual department offerings for course descriptions of the following, all of which are accepted for credit toward the Communication major.

SLAVIC LANGUAGES AND LITERATURES
133A/233A. Deviating from Dogmas: Film in East Europe from 1956 to 1968
4 units, Spr (Bulgakowa)

OVERSEAS STUDIES
FLORENCE
52. Realism, Utopia, Myth, and Society in Italian Cinema—Bernardo Bertolucci, Pier Paolo Pasolini, and Federico Fellini
5 units, Win (Campiani)

COMPARATIVE LITERATURE
Emeriti: (Professors) Joseph Frank, John Freccero, René Girard; (Courtesy Professors) W. B. Carnochan, Gerald Gillespie, Marjorie G. Perloff
Chair: to be announced
Director of Admissions: to be announced
Director of Graduate Studies: to be announced

Director of Undergraduate Studies to be announced

Professors: John Bender (English, Comparative Literature), Russell Berman (German Studies, Comparative Literature), Roland Greene (English, Comparative Literature), Hans U. Gumbrecht (French and Italian, Spanish and Portuguese, Comparative Literature), Seth Lerer (English, Comparative Literature; on leave 2000-01), Herbert Lindenberger (English, Comparative Literature; on leave Autumn), Valentin Mudimbe (French and Italian, Comparative Literature), Patricia Parker (English, Comparative Literature), Mary Louise Pratt (Spanish and Portuguese, Comparative Literature; on leave 2000-01), Richard Rorty (Comparative Literature), Ramon Saidívar (English, Comparative Literature; on leave Spring), Jeffrey Schapp (French and Italian, Comparative Literature)

Associate Professors: Monika Greenleaf (Slavic Languages and Literatures, Comparative Literature), Thomas Hare (Asian Languages, Comparative Literature), Elisabeth Mudimbe-Boy (French and Italian, Comparative Literature), Andrea Nightingale (Classics, Comparative Literature; on leave 2000-01), David Palumbo-Liu (Comparative Literature), Haun Saussy (Asian Languages, Comparative Literature; on leave 2000-01)

Consulting Professors: David G. Halliburton, John Wang
Visiting Professor: Timothy Hampton

The interdisciplinary program in Comparative Literature (CL) admits students for the Ph.D. It works toward the Ph.D. in individual language departments and, in conjunction with the Humanities honors program, offers a concentration in comparative literature for undergraduates.

UNDERGRADUATE PROGRAM
BACHELOR OF ARTS

The undergraduate major in Comparative Literature is designed for students who combine the drive and ability to master foreign languages with a strong commitment to literary study. In all cases, students must do a substantial portion of their work in at least one foreign language. The major enables these students to pursue carefully constructed programs involving the in-depth study of literature in one or more languages not their own; and the study of their literature of specialization, its theory, and its practice in relation to other literatures, communications media, and disciplines.

The major is distinguished from those in the national literatures by its comparative scope, by the requirement of seminars that focus on fundamental theoretical questions regarding the nature of literature and literary inquiry, and by its requirement that the students’ programs of study be structured around the exploration of a single literary genre, historical epoch, or theoretical problem. It differs from the “interdisciplinary” majors in English, and Modern Thought and Literature (MTL) by its requirement that every student’s program be anchored in the study of a literature other than that of his or her native language and, with specific regard to MTL, by its chronological scope.

The “comparative” aspect of each student’s program of specialization is fulfilled according to which of the two available tracks he or she elects to follow:

Track A: The Literary Studies track integrates in-depth work in a primary literature with extensive work in a second literature (in the original language) and complementary course work in an outside field.

Track B: The Interdisciplinary track integrates in-depth work in a primary literature with the focused study of literature in relation to other arts (film, music, painting, and so on), intellectual disciplines (anthropology, history, linguistics, philosophy, and so on), or comparative work in area studies.

An honors program is available in Comparative Literature for both of these tracks (see below) that integrates substantial in-depth work in a primary literature with extensive work in a second literature (in the original language) or discipline, but also requires the writing of a senior honors paper.
In both tracks, students work closely with the department’s Director of Undergraduate Studies in designing an individually tailored program of specialization involving two related areas of study. Individual study plans require considerable advance planning and must meet the approval of the Director of Undergraduate Studies.

**Declaring the Major**—As soon as a student knows that he or she would like to declare the Comparative Literature major (and no later than Autumn Quarter of the junior year), he or she should obtain a worksheet for the appropriate track (see below) from the Comparative Literature office. The completed worksheet (with prospective courses for future years) should be handed to the Director of Undergraduate Studies with an updated official transcript and the student’s advising file. The director will sign the worksheet, indicating his or her approval of the feasibility of the proposed program. This worksheet needs to be updated at least once during each academic year.

**Advising**—When a student declares Comparative Literature, he or she may choose to declare the Director of Undergraduate Studies as his or her adviser, since the director approves credit for all course work (including course work abroad). The adviser may also be a member of the core Comparative Literature faculty. If this occurs, the student must meet periodically with the Director of Undergraduate Studies to monitor his/her progress in the major and for all questions regarding the major’s requirements.

**Overseas Campuses and Abroad Programs**—The Department of Comparative Literature encourages time abroad, both for increased proficiency in language and the opportunity for advanced course work. Course work done at campuses other than Stanford’s is counted toward the major at the discretion of the Director of Undergraduate Studies and is contingent upon the University’s acceptance of classes for units. To that end, students abroad must make an effort to save all notes, papers, correspondence, and so on, to increase the chance of acceptance.

**Honors College**—The Department of Comparative Literature encourages all honors students to enroll in the honors college scheduled during the weeks preceding the beginning of every academic year. Applications to the college are available from the department administrator. The department has traditionally run its honors college in collaboration with Interdisciplinary Studies in Humanities.

### REQUIREMENTS

#### CORE FOR TRACKS A AND B

All majors in Comparative Literature (including honors) are required to complete the following courses, the first as near as possible to the date of declaration and the second during the senior year. Together, these core seminars ensure that majors have been introduced to the framing propositions and principal methods of the discipline. More specifically these courses are designed to lead students to inquire about the historical standing of such concepts as the “literary,” the “aesthetic,” “criticism,” “genre,” “text,” and “theory.”

1. **CL 101, Seminar on Literature and the Institution of Literary Study** (5 units) provides students with an introduction to the comparative study of literature, to the history of poetic theory, and to the historical development of literary fields. It is concerned with addressing foundational questions such as: what kind of knowledge is literary knowledge and how has this knowledge been codified and categorized with respect to other forms of knowledge?

2. **CL 199, Senior Seminar on Literary Theory** (5 units) offers advanced students a program of study focused on one of:
   - a) a single discipline or closely related cluster of disciplines
   - b) the cultural history of a single historical epoch
   - c) one or more of the fine arts; media or film studies
   - d) area studies

This course work must be shaped around the literature courses selected in item 1. It must either treat cognate analytical or thematic issues in the chosen discipline, or be directly relevant to the chosen historical specialization. Students who choose option ‘2d’ must select courses that include work outside a single area studies focus or that have a genuinely comparative aspect. Each of these six courses must be approved in advance by the Director of Undergraduate Studies.
3. One course, usually in translation, on a literature distant from the two of the student’s concentration. The intention here is, as above, to offer an “outside” perspective on the student’s field of specialization.

4. Students in this track must also write at least one seminar paper that is interdisciplinary in nature. This paper should bring together material from courses taken in their primary literature and in another discipline and may be an honors paper (see below), an individual research paper (developed through independent work with a faculty member in CL 198), or a paper integrating materials developed for two separate courses by arrangement with the two instructors. Though it may draw on previous course work, the paper must be an original composition; general guidelines for length require 18–20 pages. It must be submitted to the Director of Undergraduate Studies and receive his or her approval no later than the end of Winter Quarter in the fourth year of study.

Students who choose the interdisciplinary option should be aware that it requires careful advance planning given that many course offerings are offered in alternate years.

**Note**—It is worth emphasizing that, as even a cursory review of the Stanford Bulletin demonstrates, this track in no way overlaps with current offerings in the modern language and literature departments whose majors neither require nor encourage students to pursue an integrated program of interdisciplinary study in tandem with their specialization in a national literature field. What it provides is an opportunity which is elsewhere unavailable to Stanford undergraduates: namely, a major analogous to the “English with an Interdisciplinary Emphasis” track in the Department of English, yet grounded in the study of non-English literature(s) and offering broad training in literary theory.

### MINORS

The undergraduate minor in Comparative Literature (CL) represents an abbreviated version of the major. In all cases, students must do a substantial portion of their work in at least one foreign language.

All minors in Comparative Literature are required to complete CL 101, Seminar on Literature and the Institution of Literary Study (5 units). This provides an essential introduction to the framing propositions and principal methods of the discipline.

In addition, all minors must complete two courses in the literature of a language other than their native tongue. All materials in each course must be in the original language.

1. **Literary Studies Track**: Integrates in-depth work in a primary literature with work in a second literature. Requirements are:
   a) Two courses in a second literature (this may include courses in translation, as well as courses in English and/or American literature).
   b) One additional course in Comparative Literature numbered 0-100

2. **Interdisciplinary Track**: Integrates in-depth work in the primary literature with the focused study of literature in relation to another art or intellectual discipline. Requirements are:
   a) Two courses in a single discipline, or the cultural history of a single historical epoch.
   b) One additional course in Comparative Literature numbered 0-100.

   The minor is modeled primarily on the structure and progression of the major (with the appropriate reduction in course and unit requirements, as stipulated by the Committee of Undergraduate Studies). It retains the distinction between the two CL tracks and enables students to design a course of study built around the core CL seminar.

   The Director of Undergraduate Studies is responsible for evaluating all requests and individual study plans for the minor.

### HONORS PROGRAM

The honors option is reserved for exceptionally motivated students who wish to undertake an even more intensive and extensive program of study leading to the writing of a senior honors paper. The program allows for either a “Literary Studies” or an “Interdisciplinary” emphasis and it requires:

1. Six courses, using materials in the original language and making up an intellectually coherent program, in the literature of language A. For the interdisciplinary emphasis, these courses must be in the literature of a language other than the student’s native tongue.

2. **Emphasis**:  
   a) **For a Literary Studies Emphasis**: three courses using materials in the original language, in the literature of language B.
      
      Note: Track A’s rules regarding students’ native languages, bilingualism, and special exemptions for students studying Chinese, Japanese, Russian, and so on, also govern students in the honors program who opt for a Literary Studies emphasis. These course selections must be coordinated with the courses selected in the literature of language A in order that, taken together, they form a cohesive program of study focused on one of the following:  
      1) a specific literary genre  
      2) an historical epoch  
      3) a theoretical question and three cognate courses that supplement a student’s work in the two chosen literatures and lending it further intellectual shape. One course from the CL 100 series (but not 101 or 199) may be counted under this rubric.
   b) **For an Interdisciplinary Emphasis**: six courses as outlined in the general requirements for the Interdisciplinary Track (Track B), above. This course work must be shaped around the literature courses selected in item 1. It must either treat cognate analytic or thematic issues in the chosen discipline, or be directly relevant to the chosen historical specialization. Students who choose area studies for their interdisciplinary work must complete courses that work outside a single area studies focus or that have a genuinely comparative aspect. Each of these six courses must be approved in advance by the Director of Undergraduate Studies.

3. One further course is required, usually in translation, on a literature distant from the two of the student’s concentrations, so as to provide an “outside” perspective on the student’s area of specialization.

4. **During Spring Quarter of the junior year**, a letter requesting admission to the honors program must be submitted to the department’s Director of Undergraduate Studies. This letter must be accompanied by:
   a) The completed, signed worksheet
   b) An updated transcript
   c) A sample seminar paper
   d) An intended plan of study for the senior year (drawn up according to the emphasis selected)
   e) A preliminary statement (two to five pages) regarding the proposed topic of the honors paper (elaborated in consultation with the Director of Undergraduate Studies)

   (In Spring Quarter of the junior year, the student may enroll for 2 units of credit for independent research in CL 194.)

   This application is voted on by the Comparative Literature honors committee, made up of the Director of Undergraduate Studies and the Chair of the Department of Comparative Literature. Should it be approved, a faculty tutor is appointed by the director according to the topic. At the appropriate time, a second reader is designated by the honors committee.

5. **Once the request for admission to the honors track has been approved**, the student may choose to enroll in a 5-unit tutorial (CL 195, graded credit/no credit) with a faculty member during Autumn Quarter of the senior year in order to refine the project description, begin all necessary research, and initiate the composition of the honors paper.

6. **During Winter Quarter of the senior year**, the student must enroll in a 5-unit independent study (CL 195) with his or her faculty tutor for purposes of drafting the honors paper. At the end of the quarter, a completed draft must be submitted to the tutor. If it meets his or her approval as is, two copies must then be forwarded to the honors committee which will decide on the basis of the paper’s quality whether or not the student is awarded honors. If the faculty tutor feels that the
paper still requires rewriting at the end of Winter Quarter, the student may enroll for 2 units of independent study during Spring Quarter for purposes of final submission. In order to be considered for honors in Comparative Literature, two copies of the final paper must be submitted to the honors committee no later than the fifth week of Spring Quarter.

Honors papers vary considerably in length as a function of their topic, historical scope, and methodology. They may make use of previous work developed in seminars and courses, but must be of appropriate comparative or theoretical scope and should reflect the student’s chosen emphasis. Quality (not quantity) is the key criterion. As a rule of thumb, however, they run in the range of 40-70 pages.

**Honors Awards**—The two readers of any honors thesis in Comparative Literature may elect to nominate the thesis in question for University-wide awards if they feel that it is deserving. In addition, the department honors committee evaluates on a competitive basis the honors theses completed in a given year and nominates one for University-wide awards competitions.

**GRADUATE PROGRAM**

**DOCTOR OF PHILOSOPHY**

University requirements for the Ph.D. are described in the “Graduate Degrees” section of this bulletin.

The Ph.D. program is designed for a small group of students whose linguistic background, breadth of interest in literature, and curiosity about the problems of literary scholarship and theory (including the relation of literature to other disciplines) make this program more appropriate to their needs than the Ph.D. in one of the individual literatures. Students take courses in at least three literatures (one may be that of the native language), to be studied in the original. The program is designed to encourage familiarity with the major approaches to literary study prevailing today.

Before starting graduate work at Stanford, students should have completed an undergraduate program with a strong background in one literature and some work in a second literature studied in the original language. Since the program demands an advanced knowledge of two non-native languages and a reading knowledge of a third non-native language, students should at the time of application have an advanced enough knowledge of one of the three to take graduate-level courses in that language when they enter the program. They should be making enough progress in the study of a second language to enable them to make graduate courses in that language not later than the beginning of the second year, and earlier if possible. Applicants are expected to take an intensive course in the third language before entrance.

A considerable part of a student’s work consists of individual study toward the oral examinations, for which each student devises reading lists in consultation with the graduate adviser. These examinations are centered on the study of particular periods, genres, and problems of literary study.

Students are admitted under a fellowship plan which attempts to integrate financial support and completion of residence requirements with their training as prospective university teachers. Tenure as a fellow, assuming satisfactory academic progress, is for a maximum of four years, graduate-level work in literature completed elsewhere being counted as part of this four-year period. The minimum teaching requirement is the same regardless of financial support. (For specific teaching requirements, see below.) Although financial support is limited to four years, the completion of requirements often requires five years. Students in the fifth year ordinarily apply for outside fellowships or for part-time teaching positions in language and literature departments at Stanford.

**APPLICATION PROCEDURES**

Competition for entrance into the program is keen. The program is kept small so that students have as much opportunity as possible to work in individual projects under faculty supervision throughout the period of study. No more than 16 students are in residence at any one time. The department does not plan to admit more than three or four new students for the class entering in September. Completed applications are due January 1. Because of the special nature of comparative literature studies, the statement of purpose included in the application for admission should contain the following information besides the general plan for graduate work called for on the application:

1. A detailed description of the applicant’s present degree of proficiency in each of the languages studied, indicating the languages in which the applicant is prepared to do graduate work at present and outlining plans to meet additional language requirements of the program.

2. A description of the applicant’s area of interest (for instance, theoretical problems, genres, periods) within literary study and the reasons for finding comparative literature more suitable to his or her needs than the study of a single literature. Applicants should also indicate what they think will be their primary field.

All applicants should arrange to have the results of the general section of the Graduate Record Examination sent to the Department of Comparative Literature.

Recommendations should, if possible, come from faculty in at least two of the literatures in which the student proposes to work.

Applicants must submit a copy of an undergraduate term paper which they consider representative of their best work.

**DEGREE REQUIREMENTS**

**Residence**—A candidate for the Ph.D. degree must complete three years (nine quarters) of full-time work, or the equivalent, in graduate study beyond the A.B. degree. The student is expected to offer at least 72 units of graduate work in addition to the doctoral dissertation. At least three consecutive quarters of course work must be taken at Stanford.

**Languages**—Students must know three non-native languages, two of them sufficiently to qualify for graduate courses in these languages and the third sufficiently to demonstrate the ability to read a major author in this language. Only the third language may be certified by examination. The other two are certified by graduate-level course work specified below. Language preparation must be sufficient to support graduate-level course work in at least one language during the first year and in the second language during the second year. Students must demonstrate a reading knowledge of the third non-native language no later than the beginning of the third year.

Literatures made up of works written in the same language (such as Spanish and Latin American) are counted as one. One of the student’s three literatures usually is designated as the primary field, the other two as secondary fields, although some students may offer two literatures at the “primary level” (six or more graduate courses).

**Teaching**—Fellows, whatever their sources of financial support, are ordinarily required to undertake a total of five quarters of supervised apprenticeships and teaching at half time. Fellows must complete whatever pedagogy courses are required by the departments in which they teach. The department’s minimum teaching requirement is a total of three quarters.

**Minimum Course Requirements**—Students are advised that the range and depth of preparation necessary to support quality work on the dissertation, as well as demands in the present professional marketplace for coverage of both traditional and interdisciplinary areas of knowledge, render these requirements as bare minimum.

1. CL 369E.
2. A sufficient number of courses (six or more) in the student’s primary field to assure knowledge of the basic works in one national literature from its beginnings until the present.
3. At least two additional complementary courses, with most of the reading in the original, in each of two different national literatures. Students whose primary field is a non-native language are required to take two courses in one additional literature not their own.

Minimum course requirements must be completed before the student is scheduled to take the University oral examination. These requirements are kept to a minimum so that students have sufficient opportunity to seek out new areas of interest. A “course” is an offering of 3-5 units. Independent study may take the place of up to two of the required courses, but no
more; classroom work with faculty and other students is central to the program.

Examinations—Three examinations are required. The third and last is the University oral examination. Students' reading lists for each examination must be approved by an examination committee and by the graduate adviser. The examinations consist of the following, each of which takes the form of an oral colloquium between the student and a committee of faculty members with interests in the subject areas:

1. First One-Hour Examination: on a literary genre to consist of (a) a knowledge of a substantial number of literary works in a single genre, the list to include works from a number of centuries and from at least three national literatures, and (b) a grasp of the theoretical problems involved in dealing with this genre and with the question of genre in general. The examination must be taken no later than the beginning of the student's second year of graduate work (or the third quarter of the first year for students who enter with a year of previous graduate work).

2. Second One-Hour Examination: on literary criticism and theory, to consist of the exploration of a specific problem proposed and defined by the student. The problem must be sufficiently wide-ranging to demand the reading of critical texts from a variety of periods. The examination must be taken no later than the first quarter of the student's third year of graduate work (or the third quarter of the second year for students who enter with a year of graduate work). Students may elect to take this section of the examination before the genre section, in which case it must be taken at the earlier time.

3. University Oral Examination: on a literary period, to consist of in-depth knowledge of a period of approximately a century, in three or more literatures with primary emphasis on a single national literature or, in occasional cases, two national literatures. The reading list covers chiefly the major literary texts of this period but may also include some studies of intellectual backgrounds and modern critical discussions of the period. Students must demonstrate a grasp of how to discuss and define this period as well as the concept of periods in general. This examination is not to be on the dissertation topic, on a single genre, or on current criticism, but rather on a multiplicity of texts from the period. Students whose course work combines an ancient with a modern literature have the option of dividing the period sections into two wholly separate periods.

Qualifying Procedures—The qualification procedures for students in Comparative Literature take place during the quarter in which the student takes the first Ph.D. examination. Ordinarily, this is the beginning of the second year, but students who enter with a year of graduate work elsewhere must take the examination no later than the third quarter of the first year. Any student may elect to take the examination during the third quarter of the first year.

Students are judged qualified to proceed to the Ph.D. on the basis of the first part of Ph.D. examination as well as other aspects of their work (for example, performance in courses, ability to do original research) that predict strong promise for their dissertations and future careers as scholars and critics. As soon as the student has completed the qualifying procedures, the chair recommends him or her for admission to candidacy for the Ph.D. At this time the student is also recommended for the Master of Arts degree in Comparative Literature if he or she has completed 36 units of work at Stanford and has not already completed an A.M. before entering the program.

Colloquium—The colloquium normally takes place in the quarter following the University oral examination. The colloquium lasts one hour, begins with a brief introduction to the dissertation prospectus by the student lasting no more than five minutes, and consists of a discussion of the prospectus by the student and the three readers of the dissertation. At the end of the hour, the faculty readers vote on the outcome of the colloquium. If the outcome is favorable (by majority vote), the student is free to proceed with work on the dissertation. If the proposal is found to be unsatisfactory (by majority vote), the dissertation readers may ask the student to revise and resubmit the dissertation prospectus and to schedule a second colloquium.

The prospectus must be prepared in close consultation with the dissertation adviser during the months preceding the colloquium. It must be submitted in its final form to the readers no later than one week before the colloquium. A prospectus should not exceed ten double spaced pages, in addition to which it should include a working bibliography of primary and secondary sources. It should offer a synthetic overview of the dissertation, describe its methodology and the project's relation to prior scholarship on the topic, and lay out a complete chapter by chapter plan.

It is the student's responsibility to schedule the colloquium no later than the first half of the quarter after that quarter in which the student passed the University Oral Examination. The student should arrange the date and time in consultation with the department administrator and with the three examiners. The department administrator schedules an appropriate room for the colloquium.

Members of the dissertation reading committee ordinarily are drawn from the University oral examination committee, but need not be the same.

Ph.D. MINOR

This minor is designed for students working toward the Ph.D. in the various foreign language departments. Students working toward the Ph.D. in English are directed to the program in English and Comparative Literature described among the Department of English offerings. Students must have:

1. A knowledge of at least two foreign languages, one of them sufficient to qualify for graduate-level courses in that language, the second sufficient to read a major author in the original language.

2. A minimum of six graduate courses, of which three must be in the department of the second literature and three in the Department of Comparative Literature, the latter to include a seminar in literary theory or criticism. At least two of the three courses in comparative literature should originate in a department other than the one in which the student is completing the degree. Except for students in the Asian languages, students must choose a second literature outside the department of their major literature.

COURSES

Courses meeting Writing in the Major requirements are indicated by (WIM).

CORE

These courses are aimed at freshmen and sophomores who are non-majors (and/or potential majors) and provide an entry point to the discipline of Comparative Literature.

All majors are required, as soon as possible after declaration, to successfully complete CL 101. During the senior year, majors enroll in 199.

20N. Stanford Introductory Seminar: Worlds (No Longer) Apart—Preference to freshmen. For those interested in reading literature and viewing films to make sense of historical and contemporary worlds. Literary narratives, films, documentaries, and videos examine the new textures of modern life, characterized by movements of people across nations, and a globe shrinking under new global politics, economies, and telecommunications. New forms of identity reflect the cultural changes of such movements. The narratives of Chinua Achebe, Junichiro Tanizaki, Amitav Ghosh, and Gabriel Garcia Marquez (with films and documents). The impact of re-drawn borders and immigration in the U.S. in works by Maxine Kingston, David Hwang, Bienvenido Santos, and Americo Paredes. Films from the Philippines and India, television in Kathmandu with Pico Iyer.

3 units (Palumbo-Liu) not given 2000-01

22N. Stanford Introductory Seminar: Shakespeare and Performance—Preference to freshmen. The problem of "performance" (including the "performance of gender") through the plays of Shakespeare. In-class performances of scenes from plays by students, consideration of the history of theatrical performance, the critical viewing of filmed versions of particular plays, and readings on the history of gender,
“gender performance,” and transvestite theater. Possible plays: A Midsummer Night’s Dream, The Taming of the Shrew, As You Like It, All’s Well that Ends Well, Hamlet, Othello, The Comedy of Errors, Much Ado About Nothing, Antony and Cleopatra, Henry V, The Merchant of Venice, Twelfth Night, The Winter’s Tale. GER:3a,4c (DR:7)†
3 units, Spr (Parker)

24Q. Stanford Introductory Seminar: Ethnicity and Literature—Preference to sophomores. What is meant by “ethnic literature?” Answers to that question propose a sense of the constituent terms developed, i.e., what is literature? How do such notions of literature enter into a particular dynamic when “what is ethnicity” is asked? How is “ethnic writing” different from “non-ethnic” writing, or is there such a thing as either? If “ethnicity” is accepted as an analytic perspective, how does it affect the way literature is read by ethnic peoples? Articles and works of fiction; films on the subject of ethnic literature and cultural politics. Goal: to understand better how ethnic literature represents the nexus of crucial social, historical, political, and personal issues. GER:3a,4b (DR:3 or 7)†
3-5 units, Aut (Palumbo-Liu)

34N. Stanford Introductory Seminar: Other Spaces, Other People—(Same as French and Italian 34N.) Preference to freshmen. How “Otherness” and the “elsewhere” have been represented in human imagination and how individual imagery is influenced by collective representations. Focus is on lost worlds (Atlantis), mythical worlds (underground), invented worlds (Utopia), and the foreigner and stereotypes. The motives of travel, home, and displacement, and their psychological and ideological significance: mourning for lost worlds, search for happiness, desire for deterritorialization or self-fulfillment. Visual material. Readings in theory, literature, and travel accounts. Authors: Plato, Marco Polo, More, Baudelaire, Calvin, Kristeva, Todorov, Dadié, and others. GER:3a (DR:7)
3-5 units, Win (Boyi)

70N. Stanford Introductory Seminar: The Bible and World Culture—Preference to freshmen. The Bible is to many a little-known text, though it has been the foundation of major literary texts and political movements, art, and music. Its most influential portions are read from Genesis through Apocalypse, and are considered in relation to, e.g., literary excerpts, music from Handel to reggae, anti-slavery and liberationist narratives, and the major speeches of Martin Luther King. 3 units (Parker) not given 2000-01

80N. Stanford Introductory Seminar: The Science Wars—Does Physics get Closer to Reality than Poetry?—Preference to freshmen. Do the truths of natural science correspond to the intrinsic nature of reality? Does reality have an intrinsic nature, or does it just have lots of different descriptions? Is scientific progress toward those truths real? Does postmodernist relativism rot the mind and undermine the foundations of civilization? The answers introduce students to the study of philosophy. Readings: E. O. Wilson, Consilience; A. J. Ayer, Language, Truth, and Logic; Hilary Putnam, Reason, Truth, and History; T. S. Kuhn, The Structure of Scientific Revolutions. 5 units (Rorty) not given 2000-01

84Q. Stanford Introductory Seminar: Shakespeare, Playing, Gender—Preference to sophomores. Focus is on several of the best and lesser-known plays of Shakespeare and on theatrical and other kinds of “playing” (the “purpose of playing”—Hamlet), and on ambiguities, and of gender and “playing gender” in particular. Topics: transvestism inside and outside of the theater, medical and other discussions of sex changes from female to male, hermaphroditism, and fascination with the “monstrous” more generally. Possible plays: The Taming of the Shrew, The Merry Wives of Windsor, Twelfth Night, As You Like It, A Midsummer Night’s Dream, Hamlet, Othello, The Tempest, Pericles, Antony and Cleopatra, and The Merchant of Venice. GER:4c (DR:7)†
3 units, Win (Parker)

85C. Asian American Youth: Culture and Identity—Survey of the issues that affect Asian American youth in contemporary society. Focus is on higher education, hip hop, sexuality, mixed race descent, interracial dating, religion, and politics as they shape youth identity and culture. Final project.
2 units, Aut (Palumbo-Liu, Staff)

101. Seminar on Literature and the Institution of Literary Study—Introduction to the comparative study of literature and to the history and practice of literary interpretation. Students write short papers to develop their own interpretive skills. (WIM)
5 units, Win (Lindenberger)

113. Seminar: Voice and Literature in Russia and America 1776-1917—Introduction to the comparative study of literature through voice and text. In the modern era, prose and poetry have drawn from the productive tension between the vital but ephemeral spoken word and the objectification of language in writing. The shifting relationship between these modes of expression and the changing representations of voice in text have defined forms of social and cultural identity (gender, race, class, nation), and the notion of literature itself. Concepts from theoretical readings are explored in active dialogue with literary texts from several national traditions and genres. 5 units (Greenleaf) not given 2000-01

115Q. Stanford Introductory Seminar: Thinking in the Present—Discussions about 20th-Century European Philosophy—Preference to sophomores. More than the Anglo-American (“analytic”) tradition which dominates in this country’s philosophy departments, European (“continental”) 20th-century philosophy has made the effort of thinking its/our own present with its existential, social, political consequences. The continental tradition has taken greater risks and probably accepted, in exchange, a lesser degree of rigor in its style of argumentation. Readings/discussion of several analyses of “present situations,” written (in different moments and from different angles) by continental philosophers: Helene Cixous, Jacques Derrida, Martin Heidegger, Niklas Luhmann, Jean-Francois Lyotard, and Gianni Vattimo. Texts deal with questions regarding the continued viability (or non-viability) of concepts and patterns of thought in Western cultural and intellectual life (e.g., Subjectivity, Reason, Knowledge, History).
3 units, Aut (Gumbrecht)

126. 20th-Century American Fictions—(Same as English 126.)
5 units, Win (Saldivar)

194. Independent Research
1-5 units, Aut, Win, Spr (Staff)

195A,R,C. Honors—195A and B should total 10 units between the two quarters. 195B and C must be the same grade.
195A. Honors Research
0-10 units, Aut (Staff)
195B. Honors Thesis
0-10 units, Win (Staff)
195C. Honors Thesis
2 units, Spr (Staff)

199. Senior Seminar on Literary Theory—For senior Comparative Literature majors (others by application). An introduction to structuralist, post-structuralist, psychoanalytic, and marxist thinking about language, literature, and culture. Theoretical readings are supplemented with selections from the literary texts. Readings in English translation. GER:3a (DR:7)‡
5 units, Aut (Bender)

UNDERGRADUATE/GRADUATE

103/203. Egyptian East/Egyptian West—The texts and visual arts of ancient Egypt reveal a persistent and sophisticated engagement with
problems of language, the body, and multiplicity. These problems are related to the later understanding of Egypt's position vis-a-vis subsequent civilizations in "the West." Focus is on the written and visual representational systems used in the ancient Nile Valley, on Egyptian mythology as it represents gender difference, and on the ways the Egyptians constructed their relations with the divine, the metaphysical, and the eternal.

GER:4a (DR:2)
3 units, Spr (Hare)


3-4 units (Greenleaf) not given 2000-01

156D/256D. Nabokov and Modernism—(Same as Slavic Languages and Literatures 156/256.) Stories, novels, and film scripts in the context of other modernist writers (Bergson, Proust, Joyce), media (photography and film), and 20th-century events and intellectual discourses (Marxism-Stalinism, avant-garde, Freudianism, American postwar cultural ideology), whose influences Nabokov belittled or ignored. Critical approaches that elude the author's control. Readings: Despair, Camera Obscura, The Gift, Bend Sinister, Lolita, Pale Fire, excerpts of Eugene Onegin's Commentary and Speak Memory.

3-4 units, Spr (Greenleaf)

161/261. Poetess: The Grammar of the Sex when the Poet is a Woman—(Same as Slavic Languages and Literatures 161/261.) Seminar. Readings of lyrical works by women poets from the U.S., Russia, Eastern Europe, and Germany (Dickinson, Moore, Brooks and the Harlem Renaissance, Bishop, Akhmatova, Tsveetaeva, Sachs, Plath, Cisneros, Angelou, Graham, Howe, and Szymborska.) The historical and cultural context enriches our understanding of such theoretical and practical issues as "breaking and entering" the male preserve of "high poetry" in different eras; the interaction of written and oral, political, and performative modes of expression; new representations of the feminine body and experience in the visual arts; and the development of a female lineage and modes of poetic legitimation, association, and inspiration.

4 units, Win (Greenleaf)

168. Introduction to Asian American Culture—Asian American cultural production (film, drama, poetry, fiction, music) in sociohistorical context, with attention to the topics of ethnicity, race, class and gender, and the political economy of ethnic culture in the U.S. GER:3a,4b (DR:3 or 7)
5 units, Win (Palumbo-Liu)

171. Comparative Narrations of Race, Ethnicity, and Nation—How can we get a better sense of issues of race and ethnicity by comparing the construction of these notions in the U.S. to their appearance (or invisibility) in another country? The historical and contemporary constructions of race and ethnicity in France and the U.S., the histories of colonization and decolonization, global labor and economies, immigration and redrawn borders, have all demanded different modes of incorporating diverse populations into variously reformulated notions of the nation. Use of films; music; literary texts; with historical, anthropological, sociological materials.

3-5 units (Palumbo-Liu) not given 2000-01

172. From Religion through Philosophy to Literature—Introduction to non-analytic philosophy. The attempts by philosophers (Plato, Kant, and Hegel) to replace religion with philosophy, of criticisms of such attempts by Nietzsche and Kierkegaard, and of Heidegger's attempt to end philosophy and to substitute something more like poetry. GER:3a (DR:7 or 8)
5 units, Win (Rorty)

180/280. The 19th-Century Novel—The paradigmatic texts of the 19th-century novel: Scott (Waverley) and Stendhal (The Charterhouse of Parma), Flaubert (The Sentimental Education), Dickens (Great Expectations), Zola to Conrad (Heart of Darkness) to Mann (Buddenbrooks). The aim is to track the development of "realism" over the course of the "century of progress." GER:3a (DR:7)
5 units, Win (White)

202. Comparative Ethnic Autobiography—How ethnic literary texts have provided the occasion for the production of particular kinds of "selves," and how these productions might disclose the varied possibilities of racialized "self fashioning." The material is comparative in terms of the inter-racial cultural and social histories witnessed in the narrative texts and our own sense of location and identity. Who are these texts written to and how does the issue of audience shift our understanding of the possible significances of the text? How does historical moment contribute to the shape of these narratives and our understandings of race, gender, and ethnicity? What are the relations between aesthetics and ideology? What might the gaps be between the desired effect of the text and its actual realization in the minds of disparate audiences? The category of "autobiography" includes autobiographical fiction and essays. GER:4b (DR:3)
5 units, Spr (Palumbo-Liu)

210. Women Writers of Early Modern Europe—The female literary experience in Early Modern France, and Spain. Close readings of, e.g., Marguerite de Navarre, Maria de Zayas, and Madame de Lafayette. Topics: marriage and the convent; virgins and widows; gossip; court culture. Additional readings from Boccaccio, Rabelais, etc., with representative critical readings from Foucault, Lacan, Butler, Mignolo, etc. Required readings available in English; students are encouraged to read in the original.

4-5 units, Spr (Middlebrook)

212. The History of Rhetoric—The history of the discipline of rhetoric from Classical Greek and Latin traditions, through medieval, Renaissance, modern, and contemporary treatments. Schemes and tropes (Cicero and Quintilian); grammatical education and the schools (Geoffrey Vinsauf, John of Garland); Renaissance handbooks (Wilson, Puttenham); 18th- and 19th-century oratory; current appropriations (e.g., Paul de Man, deconstruction). Texts are read for their deployments of rhetorical devices and their thematic attentions to verbal organization (e.g., selections from the Aeneid, medieval lyrics, Chaucer's Canterbury Tales, Shakespeare's Hamlet, Augustan and Romantic poetry, 19th-century prose fiction). Modern English translations; some emphasis to original-language texts of earlier periods.

4-5 units (Lever) not given 2000-01

220. Versions of the Self—Studies of the genre of autobiography in cross-cultural perspective, concentrating on the topics of "the self, the subject, and the other" in myth, religion, history, and literature in the 20th century. How have the "extreme" situations of 20th-century life (atomic warfare, population displacement, concentration camps, changes in the conditions of work, plagues, and ecological disasters) led to the dismantling of traditional (religious and humanistic) notions of selfhood and the effort to redefine the nature of human subjectivity? Readings of Western, Asian, Latin American, and Middle Eastern biography.

5 units (White) not given 2000-01

264E. Seminar: Petrarch and Petrarchism—The Latin and vernacular writings of Francesco Petrarca, and their influence and impact on European cultural history in literature and the arts. Readings from Petrarch's fundamental works (Trionfi, Canzoniere, Africa, Secretum, Epistulae, etc.), and authors such as Garcilaso, Gongora, Sydney, Spenser, and Ronsard. Readings available in English translation.

5 units (Schnapp) not given 2000-01

268. Introduction to Dream of the Red Chamber—A study of the Chinese novel Hong lou meng (ca. 1750) by Cao Xueqin and Gao E,
together with its major commentaries. Methods of Euro-American criticism are tested against this seductive and challenging work. Readings in English translation.

4 units (Saussure) not given 2000-01


5 units (Palumbo-Liu) not given 2000-01


4-5 units, Win (Bender, Lenoir, Taylor)

300. The Theory of the Text—Studies in the theory of textuality, textualism, discourse, and interpretation. Issues connected with narrative and narrativity; the structure of tales, stories, and myths; the modernist rejection of narrativity; and narrative as a cognitive mode.

Theorists: Lukacs, Propp, Greimas, Barthes, Genette, Girard, Jameson, etc.

5 units, Win (White)

300B. Colloquium: The Bible and Literature—Combines intensive readings from Genesis to Revelation, with selections from literary texts (Dante and medieval drama through Shakespeare, Spenser, Renaissance lyric, and Milton; 19th- and 20th-century poetry and novels from British, American, African-American, African, etc.). Related topics: the relation between biblical eschatology and literary strategies, Song of Songs and the history of lyric, the influence on prototypes of race/gender difference, citations in radical and hegemonic political contexts.

4-5 units (Parker) not given 2000-01

301C. Nations and Cosmopolitanisms—The origins of modern comparative literary study may be traced to an engagement with the idea of distinct nations and national cultures, and the modern articulation of cosmopolitan culture. The various facets and formations of this engagement, including historical studies which point to the construction of “literature” as a modern object, and recent work on nations and national identity (culture wars, patriotism, post-ethnicity) and new cosmopolitanisms (“rooted cosmopolitanism,” cultural studies in different national and institutional sites, etc.) in which “literature” variously appears and disappears, removed from or reinstituted in its role as “culture.”

5 units (Palumbo-Liu) not given 2000-01

308C. Seminar: Introduction to Literary Criticism and Theory—Introduction to literary theory and criticism from New Criticism through Structuralism, post-Structuralism, archetypal; and psychoanalytical criticism to post-Modernist textualism.

5 units (White) not given 2000-01

310E. Lyric Economies in the European Renaissance—(Same as French and Italian 310E.) Courtly lyric in Early Modern Europe, from the troubadours to the age of Shakespeare. Topics: patronage, print culture, English and Continental relationships, exploration and empire. Writers: Petrarch, Ronsard, Du Bellay, Shakespeare, Sidney, Garcilaso and Sor Juana. Critical and theoretical readings from Marx, Bourdieu, Adorno, etc.

4-5 units, Spr (Hampton)


5 units (White) not given 2000-01

314. Epic and Empire—(Same as English 314.) Focusing on Virgil’s Aeneid and its influence, traces the European epic tradition (Ariosto, Tasso, Camoens, Spenser, and Milton) to New World discovery and mercantile expansion in the early modern period.

5 units, Spr (Parker)

316E. “New Lacanian” Politics—(Same as French and Italian 316E.)

5 units, Aut (MacCannell)

317E. Crowds—(Same as French and Italian 317E.)

5 units, Spr (Schnapp)

325. Politics and Culture—The ways in which culture has been read next to and in the political, with specific reference to history. Readings of Lukacs, Adorno, Benjamin, Gramsci, Leavis, Williams, CLR James, Howe, Bell, and recent works by Moi, Gilroy, Anzaldua, Mulloz, Jameson.

5 units, Spr (Palumbo-Liu)

359E. Seminar: Writing and Cookery—Towards a Literary Anthropology of Food—Graduate research tracks the literal and figurative overlap between the realms of writing and food. Plato’s dialogues, which linked cookery to Sophistry; and Roman satire (a genre rooted in a culinary analogy and beyond). The role of food preparation, presentation, and consumption in a literary-anthropological light. Topics: Petronius’s Banquet of Trimalchio; Goliardic song, devilry, and cookery in Dante’s Inferno; food in Rabelais and “Macaronic” literature (Folengo); Brillat-Savarin’s La Physiognomie du Gout; Nietzsche’s notions of diet; and Marinetti’s Futurist Cookbook. Secondary readings: Levi Strauss, Bynum, Elias, Dettene, and Vernant. Enrollment limited to 12.

5 units (Schnapp) not given 2000-01

359F. Seminar: Transnational Poetics—(Same as English 359.)

4-5 units, Aut (Saldivar)

360. Non-Representational Theories of Language and Thought—The works of Wittgenstein, Davidson, and Derrida, with some reference to Locke, Saussure, Brandom, and others.

5 units (Rorty) not given 2000-01

361C. Graduate Colloquium: The Modern Tradition—Globalization and Modernity—Rather than assume one modern tradition, the colloquium encourages the analysis of the (uneven) appearance of a number of possible “modernities” in various geopolitical spaces, their cultural and historical formations, and their inter-relations. Can modernity be seen as a uniquely “western” achievement? By examining such diverse topics as trade and migration, nationalism and postcolonialism, the complicated history of modernity is understood as a global phenomenon. Prerequisite: consent of instructor.

5 units, Aut (Palumbo-Liu)

366. Seminar: Literary Theory—Structuralism and After—Introduction to the theorists whose ideas shaped the study of literature and culture over the past generation. The entry point is recent works by Butler, Guillory, Spivak, Zizek, etc. Selections from prior theorists focus on issues of present concern: Saussure, Jakobson, Volosinov, Levi-Strauss, Lacan, Althusser, Austin, Foucault, Derrida, Bourdieu, Kristeva.

4-5 units (Bender) not given 2000-01

369E. The Disciplines of Literature—(Same as French and Italian 369E.) Open to all entering graduate students in the Division of Literatures, Cultures, and Languages. Introduction to the history, structure, and intellectual debates of the disciplines of literary study. The origins of comparative and national literatures in the study of philology and the institutions of the European university. Key theoretical moves that
shaped literary theory, criticism, and history in America: semiotics and structuralism, deconstruction, and post-structuralist critiques; the renewed interest in the rhetoric and rhetorical reading, identity politics, and ethnic studies; views of the literary canon and the impact of cultural studies.

3 units, Aut (Gumbrecht, Schnapp)

370. The Anthropology of Speed—A dialogue between the history of technology and cultural history (art, music, literature, film). Seminar examines the formative impact of themes of speed, acceleration, and intensification on modern notions of experience, subjectivity, signification, power, and production. Topics: 18th-century coaching and the rise of amateur coaching; the rise of sporting and racing subcultures and sporting media during the early 19th century; psycho-physical theories of thrill and shock; exercise and hygiene from the fin de siècle to the present; scientific management and the world of work; bodies and machines; cognitive and perceptual ramifications of aviation, mechanized ground transportation, film, and video; velocity, addiction, entertainment, and ennui. Authors: De Quincey, Marinetti, Virilio, Ballard.

not given 2000-01


4-5 units (Parker) not given 2000-01

372. Literary Theory and the Necessary Fiction of Asia—The role of effective multiculturalism (fantasy, misunderstanding, exaggeration, projection, and minor effects) in the domain of theories about literature and culture. The enabling role of a hypothetical "other" culture. The resulting lessons as integrated into our practice as students of Asia. Readings from Hegel, Nietzsche, Segalen, Pound, Husserl, Corbin, Heidegger, Foucault, Derrida, de Man, Geertz, Said, Kristeva, Clifford, etc.

4 units (Saussy) not given 2000-01

389. Seminar: Regimes of Inscription—Memory, Writing, and Printing—Since the 18th century, theories about oral composition and transmission have perturbed the order of literary studies (including the hermeneutics of sacred texts). During the last 50 years, an awareness of the historical and technological specificity of print, concurrently with the growth of electronic media, has led to a questioning of the understanding of writing, text, and reading basic to textual interpretation. These questions are examined as they arise in various local contexts, seeking to displace alphabetic writing as the norm of inscription. Readings from Homer, Sappho, Aristotle, Mencius, Vico, Lowth, Janet, Jousse, Parry, Luria, McLuhan, Derrida, Zumthor, Goody, etc.

4 units (Saussy) not given 2000-01

395. Research

1-15 units, any quarter (Staff)

395A,B,C. Philosophical Reading Group—Close reading of classical and contemporary texts from the Western philosophical tradition.

2-3 units, Aut (Gumbrecht)

399. Dissertation

1-15 units, any quarter (Staff)

RELATED OFFERINGS

Courses primarily of a comparative nature are listed below and require enrollment in the departments they are listed under.

ASIAN LANGUAGES AND LITERATURES

92. Traditional East Asian Civilization: Japan

5 units, Win (Hare)
GERMAN STUDIES
132. 19th-Century Literature and Culture: Romanticism
   4 units, Aut (Eshel)
133. 20th-Century Literature and Culture: Modernism
   4 units, Win (Kenkel)
161N. Stanford Introductory Seminar: The Arthurian Legend in Literature and Film
   3-5 units, Spr (Poor)
163A. Kafka
   3-5 units, Spr (Berman)
241A-243A.
   241A. Deutsche Geistesgeschichte I: 18th-Century German Thought
      3-5 units, Aut (Mueller-Vollmer)
   242A. Deutsche Geistesgeschichte II: 19th-Century German Thought
      3-5 units, Win (Pan)
   243A. Deutsche Geistesgeschichte III: 20th-Century German Thought
      3-5 units, Spr (Poor)
279. Naturalism
   4 units, Win (Kenkel)

LANGUAGE CENTER
125A,C,D,E. Topics in Arabic Literature and Culture—Designed to be taken independently. Readings/discussion in English.
   125A. The Contemporary Arabic World and Culture through Literature
      4 units, Aut (Barhoum)
   125C. Contemporary Arab Women Writers and Issues
      4 units (Barhoum) not given 2000-01
   125D. Arab World through Travel Literature
      4 units, Spr (Barhoum)
   125E. Short Stories and Poetry from the Arab World
      4 units, Win (Barhoum)

SLAVIC LANGUAGES AND LITERATURES
133A/233A. Deviating from Dogmas: Film in East Europe from 1956 to 1968
   4 units, Spr (Bulgakowa)
145/245. The Age of Experiment (1820-1850)
   3-4 units, Aut (Greenleaf)
146/246. The Age of Transgression: Russian Literature from Turgenev through Tolstoy
   4 units, Win (Safran)
147/247. The Age of Revolution: Russian Literature and Culture since 1917
   3-4 units, Spr (Freidin)
151. Dostoevsky and His Times
   4 units, Win (Frank)
152/252. Russian Modernist Theater: Naturalism, Expressionism, Symbolism, and Futurism
   4 units, Win (Bulgakowa)
154/254. History of Russian Theater
   4 units, Aut (Bulgakowa)

163. Beyond Fiddler on the Roof: The Jewish Experience in Eastern Europe through Literature and Film
   4 units, Aut (Safran)
272A. Osip Mandelstam and the Modernist Paradigm
   4 units, Win (Freidin)

SPANISH AND PORTUGUESE
253E. The Modern Imagination and Mexico’s Ancient Books
   3-5 units, Aut (Brotherston)

307. Latin American Cultural Theory: A Historical Perspective
   3-5 units, Aut (Sd)
313. The Colonial Condition
   3-5 units, Spr (Gomez)
327. Literary and Cultural Theories
   3-5 units, Aut (Rios)
328. Nation(s) and Citizenship(s): Modernity, Postmodernity, and Globalization
   3-5 units, Aut (Rios)

344E. Decolonizing the Middle Ages
   3-5 units, Spr (Dagenais)

OVERSEAS STUDIES
These courses are approved for the Comparative Literature major and taught overseas at the campus indicated. Students should discuss with their major advisers which courses would best meet individual needs. Descriptions are in the "Overseas Studies" section of this bulletin, or at the Overseas Studies Office, 126 Sweet Hall.

MULTI-SITE COURSE
91. Literary Institutions: A Comparative Approach
   4 units, Win (Berman)

OXFORD
140X. The Condition of Postmodernity: England in the Postcolonial Era
   units to be announced, Spr (Saldivar)

150X. Gardens of Earthly Delight: The Cultural Politics of English
   units to be announced, Spr (Saldivar)

PARIS
110P. French Anthropology
   units to be announced, Win (Saussy)
120P. Baudelaire: A Poet in the City
   units to be announced, Win (Saussy)

COMPARATIVE STUDIES IN RACE AND ETHNICITY (CSRE)

Director: Albert Camarillo
Steering Committee: Albert Camarillo, Gordon Chang, George Fredrickson, Hazel Markus, John Rickford, C. Matthew Snipp, Dorothy Steele
Students who declare any of the five majors participate in a common curriculum of the CSRE consisting of at least two introductory "core" courses and a senior seminar. Individually designed majors in Jewish Studies may also enroll in the CSRE core curriculum.

MINORS

Students who wish to minor in the study areas must complete six courses (a minimum of 30 units) from the approved CSRE course list, two of which must be introductory "core" courses. Proposals for the minor must be approved by the chair of each study area.

DIRECTED READING AND RESEARCH

Directed reading and research allows students to focus on a special topic of interest. In organizing a reading research plan, the student consults with the chair of the major and one or more faculty members specializing in the area or discipline.

SENIOR SEMINAR

Research and the writing of the senior honors thesis or senior paper is under the supervision of a faculty project adviser. The seminar is offered in Autumn Quarter, and discussions take students through the process of research (conceptualization, development of prospectus, development of thesis, research, analysis, and writing). This course meets the writing in the major requirement (WIM). Those who opt to write senior papers are organized into tutorial groups in Autumn Quarter.

RELATED PROGRAMS

CSRE-related majors have several unique opportunities available to them. The program supports full-time paid summer internships for those who apply to work in a non-profit or government agency in a public policy-related area. The CSRE Public Policy/Leadership Institute is a two-week, pre-Autumn Quarter seminar that provides exposure to critical public policy issues and is taught by a leading faculty member. The residence-based institute provides room and board and all seminar materials for participants, including a visit to Sacramento to meet with policymakers. Those who apply to the Stanford in Washington program in Spring Quarter have the opportunity to enroll in a CSRE-sponsored seminar, Race and Ethnicity and American Public Policies. The CSRE program also sponsors quarterly career workshops and informal luncheons for all majors and minors.

HONORS

Majors in each of the study areas who meet academic qualifications (at least a grade point average (GPA) of 'B+' in CSRE-related courses) may apply for admission. Majors are expected to participate in a Spring Quarter junior workshop in preparation for their honors thesis research. Prizes for the best undergraduate honors theses are awarded annually by the Curriculum Committee of CSRE.

AFRICAN AND AFRICAN AMERICAN STUDIES (AAAS)

Chair: John Rickford

Since 1997-98, AAAS has been a CSRE-related major. For major and minor descriptions and requirements, see the “African and African American Studies” section of this bulletin.

ASIAN AMERICAN STUDIES

Chair: Gordon Chang

Asian American Studies (AAS) provides an interdisciplinary approach to understanding the historical and current experiences of persons of Asian ancestry in the United States. In using the term "Asian American," the AAS faculty recognize that the term seeks to name a rapidly developing, complex, and heterogeneous population and that there is neither a single Asian American identity nor one "community" that comprises all Asian Americans. Asian Americans include those with ancestral ties to countries or regions in East Asia, South Asia, Southeast Asia, or the Philippines, among others.
AAS brings together courses that address the artistic, historical, humanistic, political, and social dimensions of Asian Americans and is an appropriate course of study for students interested in a variety of concerns related to Asian Americans, including: artistic and cultural contributions, current social significance, historical experiences, immigration, intellectual, policy issues, relationships with other social groups, and the construction of "Asian American" as it addresses important theoretical and practical issues.

**REQUIREMENTS**

AAS offers undergraduate opportunities for either a major or a minor. In addition to the 15 units in the CSRE core curriculum, 45 units are distributed as follows: 5 units in a course with an international dimension; 30 units in Asian American focus courses selected from among historical studies, social sciences, and humanities; and 10 units in courses offering comparative perspectives. In certain instances, students are able to apply credit from the study of an Asian language to help meet requirements and receive a special citation for relevant language study. For students already fluent in an Asian language, the citation may also be earned to apply credit from the study of an Asian language to help meet requirements.

Students interested in the major or minor in AAS with a faculty adviser to develop a specific program of study. The proposal must be approved by the Chair of AAS. Policies and programming for the major and minor are guided by the Asian American Studies Curriculum Committee.

**CHICANA/O STUDIES**

*Chair: Guadalupe Valdés*

Chicana/o Studies is an interdisciplinary major focusing on the Mexican-origin population of the U.S., the second largest ethnic group in the nation. Students who major or minor in Chicana/o Studies have an opportunity to select from a wide variety of courses in the humanities and social sciences as well as selected courses offered by affiliated faculty in the School of Education. In addition to the CSRE introductory "core" courses, students who major and minor in Chicana/o Studies are required to enroll in the Introduction to Chicana/o Cultural Studies.

**REQUIREMENTS**

Together with their faculty mentors, majors design a thematic concentration consisting of eight courses (40 units). The substantial number of courses available across the disciplines permit majors to develop unique and innovative thematic concentrations. Students also have opportunities to participate in public service-learning internships related to their academic course of study. The Chair of Chicana/o Studies Curriculum Committee approves applications for majors and minors and reviews proposals for the honors program. The major is guided by a curriculum committee.

A "Spanish Language Proficiency Option" is offered to majors interested in using Spanish in their course work or for their research. This option, modeled on programs of foreign language study across the curriculum at other institutions, is aimed at students who have a strong interest in using the Spanish language proficiency they have acquired in meaningful contexts outside of foreign language courses. There are several ways to complete the Spanish Language Proficiency Option. Consult with the Chair of Chicana/o Studies for details about these options.

Students who wish to minor in Chicana/o Studies must enroll in two CSRE introductory "core" courses and the Introduction to Chicana/o Cultural Studies course. The remaining three courses must be designed around a general theme or topic.

**COMPARATIVE STUDIES IN RACE AND ETHNICITY**

*Chair: Albert Camarillo*

The major and minor in Comparative Studies in Race and Ethnicity (CSRE) offer students one of the most unique opportunities in higher education: to study the topics of race and ethnicity from comparative national and international perspectives. How to manage and to understand ethnic differences and conflicts has long been a central issue in international affairs, especially since the end of the Cold War, and an intense debate has developed in the United States on how to achieve justice and equality in an ethnically diverse, multicultural society. The themes of both interethnic cooperation and conflict are critical for comprehending the history and current social reality of racial and ethnic groups world-wide.

Students have an opportunity to structure a major or minor through CSRE that encourages the study of these and other important issues facing the U.S. and other societies.

**REQUIREMENTS**

Students who major in CSRE enroll in the core curriculum, and in consultation with the chair of the program and a faculty mentor, develop a thematic course of study focusing on the comparative dimensions of race and ethnicity. Though majors and minors in CSRE must complete the CSRE core introductory courses before they focus their work on the thematic concentration, students have great flexibility to structure and design their comparative curriculum. For example, students may opt to develop a concentration comparing two or more groups within the U.S. or they may choose to study groups in the U.S. in comparison to ethnic groups elsewhere in the world. Or, they may opt to study the diaspora of a single group or the sovereignty of indigenous peoples within and across different national contexts. In different examples of thematic concentrations for the CSRE major, students may prefer to study issues of international migration or how social constructions of racial identities are influenced by gender or class.

The thematic course of study developed by CSRE majors must be approved by the CSRE chair. Proposals for the minor and admission to the CSRE honors program must be approved by the chair. The policies and programs for the major and minor are guided by the Curriculum Committee of the CSRE Faculty Steering Committee.

**PROGRAM IN JEWISH STUDIES**

*Chair: Steven Zipperstein*

Jewish Studies is an affiliated program of CSRE. For program and course descriptions see the "Jewish Studies" section of this bulletin.

**NATIVE AMERICAN STUDIES**

*Chair: C. Matthew Snipp*

Native American Studies provides an intensive approach to understanding the historical and contemporary experiences of Native American people. Attention is paid not only to the special relationship between tribes and the Federal government, but to issues across national boundaries, including tribal nations within Canada, and North, Central, and South America. In using the term "Native American," the NAS faculty recognize the heterogeneous nature of this population. Native Americans include the Alaska Native population, which comprises Aleuts, Eskimo, and other Native American people residing in Alaska.

The purpose of the Native American Studies major and minor is to introduce students to a broad range of approaches in the academic study of Native American people, history, and culture. Students who major in Native American Studies have the opportunity of doing advanced work in a number of related fields, including literature, sociology, education, and law. In addition to specialized course work on Native American issues, students also are expected to concentrate in a traditional discipline such as anthropology, history, or psychology to ensure they have a well rounded educational experience. The area of concentration and related course work should be selected in consultation with a faculty adviser in Native American Studies. All courses in the program in some way promote the ongoing discussion of how academic knowledge about Native Americans relates to the historical and contemporary experiences of Native American people and communities.

**REQUIREMENTS**

NAS offers undergraduates opportunities for either a major or minor. The major requires 60 units of course work. In addition to the 15 units of CSRE core courses, 45 units are distributed as follows: 30 units in Na-
live-American focus courses selected from among humanities and social sciences; 5 units in a course devoted to the methodologies, theories, or field research in a particular area of study; and 10 units in courses offering comparative perspectives. Students may acquire credit from a service-learning internship option. Minors take 30 units in a program of study similar in form to that of majors. A proposal for the major must be approved by the chair.

**COURSES**

**CORE**

**COMPARATIVE LITERATURE**

202. Comparative Ethnic Autobiography  
5 units, Spr (Palumbo-Liu)

**COMPARATIVE STUDIES IN RACE AND ETHNICITY**

200XYZ. Senior Seminar—(200X fulfills WIM.)  
units by arrangement, Aut, Win, Spr (Chang)

**CULTURAL AND SOCIAL ANTHROPOLOGY**

88. Theories of Race and Ethnicity: A Comparative Perspective  
5 units, Win (Yanagisako)

**EDUCATION**

156X. Understanding Racial and Ethnic Identity  
5 units (LaFromboise) not given 2000-01

**HISTORY**

65. Introduction to Comparative Studies in Race and Ethnicity  
5 units, Spr (Camarilla, Staff)

257. Undergraduate Colloquium: Immigrants and Racial Minorities in American Cities—Comparative Perspectives  
5 units (Carson) not given 2000-01

**PHILOSOPHY**

177. Philosophical Issues Concerning Race and Racism  
4 units, Spr (Satz)

**THEMATIC**

**AFRICAN AND AFRICAN AMERICAN STUDIES**

105. Introduction to African and African American Studies  
5 units, Spr (McCants)

106A,B,C. African and African American Studies Lecture Series  
1-3 units, Aut (Rickford)  
Win (Jackson)  
Spr (McCants)

107. African and African American Studies Learning Expedition  
1 unit, Spr (Staff)

**ANTHROPOLOGICAL SCIENCES**

8. Introduction to Anthropological Genetics  
5 units, Win (Mountain)

**ASIAN AMERICAN STUDIES**

181. Readings in other Literatures of Asian America  
5 units, Spr (Pelaud)

**COMMUNICATION**

122B. Documentary Film  
5 units, Win (Krawitz)

155. Interethnic Communication  
5 units, Spr (Leets)

**COMPARATIVE STUDIES IN RACE AND ETHNICITY**

203. Race and Education: Strategies for Change in the 21st Century  
5 units, Spr (Montoya, Steyer)

204. Israel/Palestine: Literature, Politics, and Identity—(Same as Jewish Studies 204.)  
5 units, Win (Alcalay)

**COMPARATIVE LITERATURE**

88C. Asian American Youth: Culture and Identity  
2 units, Aut (Palumbo-Liu, Staff)

168. Introduction to Asian American Culture  
5 units, Win (Palumbo-Liu)

171. Comparative Narrations of Race, Ethnicity, and Nation  
3-5 units (Palumbo-Liu) not given 2000-01

**CULTURAL AND SOCIAL ANTHROPOLOGY**

72. Dance and Culture in Latin America—(Same as Drama 168.)  
3-4 units, Spr (Cashion)

77. Japanese Society and Culture  
5 units, Aut (Inoue)

83A. Korean American Diaspora  
5 units, Aut (Lee)

85. Trials of the 20th Century: Technology, Law, and Culture  
5 units, Aut (Jain)

87. Social Change in Contemporary China: Remaking the Middle Kingdom  
5 units, Win (Kohrman)

87A. Human Rights: Anthropological Perspectives  
5 units, Spr (Davis)

88A. Race and Ethnicity in Mexico  
5 units, Spr (Vaughn)

132. Science, Technology, and Gender  
5 units, Win (Jain)

153B. Millennialism in the American Imaginary: From Columbus to the Present  
5 units (Delaney) not given 2000-01

250A. Gender, Race, and Colonialism: On the Politics of Knowledge  
5 units, Aut (Stoler)

**DRAMA**

113. Group Communication  
4 units, Win, Spr (Schrader)

163. Performance and America  
5 units, Aut (Elam)

**DANCE**

42. Dances of Latin America  
1 unit, Aut (Cashion)

43. Afro-Brazilian and Afro-Peruvian Dance  
1 unit, Aut (Cashion)

75. Mexican Dance and Folklore  
2 units, Win (Cashion)
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tr>
<td>143</td>
<td>Afro-American Roots of American Concert Dance</td>
<td>2</td>
<td>Win (Moses)</td>
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<tr>
<td>168</td>
<td>Dance and Culture in Latin America—(Same as Cultural and Social Anthropology 72.)</td>
<td>3-4</td>
<td>Spr (Cashion)</td>
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<td>141</td>
<td>Race, Education, and the Media</td>
<td>5</td>
<td>Win (Carnoy, Steyer) not given 2000-01</td>
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<td>149</td>
<td>Theory and Issues in the Study of Bilingualism</td>
<td>3-4</td>
<td>Aut (Valdés)</td>
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<td>170</td>
<td>Gender and Education</td>
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<td>Aut (Christopher)</td>
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<td>175/275X</td>
<td>African-American English in Educational Context</td>
<td>3</td>
<td>Win (Baugh)</td>
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<td>177X</td>
<td>Education of Immigrant Students: Psychological Perspectives</td>
<td>4</td>
<td>Win (Padilla)</td>
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<tr>
<td>179</td>
<td>Urban Youth and their Institutions: Research and Practice—(Same as 279.)</td>
<td>3-4</td>
<td>Aut (McLaughlin)</td>
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<td>193B</td>
<td>Peer Counseling: Chicano Community</td>
<td>2</td>
<td>Aut (Martinez)</td>
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<tr>
<td>193C</td>
<td>Peer Counseling: The African-American Community</td>
<td>2</td>
<td>Aut (Edwards, Reed-Hoskins)</td>
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<tr>
<td>193N</td>
<td>Peer Counseling: The Asian American Community</td>
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<td>Win (Brown)</td>
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<td>201</td>
<td>History of Education in the United States—(Same as History 158.)</td>
<td>3</td>
<td>Aut (Williamson)</td>
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<td>201A</td>
<td>History of African American Education through 1940</td>
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<td>201B</td>
<td>Education for Liberation</td>
<td>3</td>
<td>Aut (Williamson) given 2001-02</td>
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<td>202</td>
<td>Introduction to Comparative and International Education</td>
<td>4-5</td>
<td>Aut (Mundy)</td>
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<td>203X</td>
<td>Education and Inequality in American Culture</td>
<td>2</td>
<td>Aut (McDermott)</td>
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<td>203Y</td>
<td>Discussion: Education and Inequality in American Culture</td>
<td>2</td>
<td>Aut (McDermott)</td>
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<td>283</td>
<td>Attitudes toward Languages and Language Study</td>
<td>3</td>
<td>Win (Padilla) not given 2000-01</td>
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<td>306A</td>
<td>Education and Economic Development</td>
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<td>306C</td>
<td>Culture and Technology</td>
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<td>335X</td>
<td>Language Policy and Planning: National and International Perspectives</td>
<td>3</td>
<td>Spr (Valdés)</td>
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<td>340X</td>
<td>American Indian Mental Health and Education</td>
<td>3</td>
<td>Spr (LaFromboise)</td>
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<td>381</td>
<td>Multicultural Issues in Higher Education</td>
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<td>Aut (Antonio) not given 2000-01</td>
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<td>388B</td>
<td>Bilingual Education</td>
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<td>Win (Hakuta)</td>
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<td>126A</td>
<td>African-American Writing, 1950-1970</td>
<td>5</td>
<td>Win (Drake)</td>
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<td>162H</td>
<td>Literature of the African Diaspora</td>
<td>5</td>
<td>Win (D. Jones)</td>
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<td>164B</td>
<td>Imagining the Holocaust</td>
<td>5</td>
<td>Spr (Felstiner)</td>
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<tr>
<td>168</td>
<td>American Indian Mythology, Legend, and Lore</td>
<td>5</td>
<td>Win (Fields)</td>
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<tr>
<td>168B</td>
<td>Introduction to Afro-American Literature</td>
<td>5</td>
<td>Win (Ramopersad)</td>
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<tr>
<td>187B</td>
<td>Seminar: Central Issues in African-American Intellectual History</td>
<td>5</td>
<td>Spr (Drake)</td>
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<tr>
<td>187N</td>
<td>Seminar: W. E. B. Du Bois and American Culture</td>
<td>5</td>
<td>Win (Ramopersad)</td>
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<tr>
<td>262</td>
<td>Literatures of the Americas</td>
<td>4-5</td>
<td>Aut (D. Jones)</td>
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<tr>
<td>140S</td>
<td>Sex and Gender in Classical Hollywood Cinema: Making Woman Asian</td>
<td>5</td>
<td>Spr (Parrenas)</td>
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<td>45S</td>
<td>Sources and Methods Seminar: First Americans—Native Identities in the American West (1865-Present)</td>
<td>5</td>
<td>Spr (Warren)</td>
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<tr>
<td>51S</td>
<td>Sources and Methods Seminar: The Politics of Self-Definition—Ethnic Nationalism in the Civil Rights Era</td>
<td>5</td>
<td>Spr (Chavez)</td>
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<tr>
<td>61</td>
<td>The Constitution and Race</td>
<td>5</td>
<td>Rakove not given 2000-01</td>
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<tr>
<td>75</td>
<td>The United States and East Asia</td>
<td>5</td>
<td>Win (Chang, Duus)</td>
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<tr>
<td>87</td>
<td>Empires and Cultures in the Modern World</td>
<td>5</td>
<td>Staff not given 2000-01</td>
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</tbody>
</table>
148C. Africa in the 20th Century
5 units, Spr (R. Roberts)

150A. African-American History to the 20th Century
5 units, Aut (M. Thompson)

150B. Introduction to African-American History: The Modern Black Freedom Struggle
5 units, Spr (Carson)

159. Introduction to Asian American History
4-5 units, Spr (Chang)

167C. Introduction to Feminist Studies—(Same as Feminist Studies 101.)
5-6 units, Win (Freedman)

187. Palestine, Zionism, and the Arab-Israeli Conflict
5 units (Beinin) not given 2000-01

187B. The Middle East in the 20th Century
5 units, Win (Beinin)

188C. Jews in the Modern World
5 units, Aut (Zipperstein)

248S. Undergraduate Research Seminar: Colonial States and Societies in Africa
5 units, Win, Spr (R. Roberts)

250. Undergraduate Colloquium: American Popular Culture
5 units, Win (M. Thompson)

251A,B. Undergraduate Colloquium: Poverty and Homelessness in America
8 units (Camarillo) not given 2000-01

253. Undergraduate Colloquium: Topics in African American History—The Great Migration
5 units (M. Thompson) not given 2000-01

255. Undergraduate Colloquium: The History of Multiraciality in America
5 units, Aut (Pang)

255A. Undergraduate Colloquium: Culture and Ideologies of Race
5 units, Aut (M. Thompson)

256. Undergraduate Colloquium: Topics in Mexican American History
5 units (Camarillo) not given 2000-01

259. Undergraduate Colloquium: Race and Ethnicity in the United States and South Africa
5 units (Fredrickson) not given 2000-01

265. Undergraduate Colloquium: New Research in Asian American History
5 units (Chang) not given 2000-01

270S. Undergraduate Research Seminar: North American Wests
5 units, Spr (White)

288. Undergraduate Colloquium: Palestine and the Arab-Israeli Conflict
5 units, Aut (Beinin)

HUMAN BIOLOGY

141. Race, Poverty, and the Environment
5 units (Rosencranz) not given 2000-01

LINGUISTICS

73. African American Vernacular English
3-5 units (Rickford) alternate years, given 2001-02

150. Language in Society
4-5 units, Spr (Eckert)

159. Language and Youth Culture
5 units, Win (Heath)

251. Pidgin and Creole Sociolinguistics
4 units, Aut (Rickford)

MUSIC

3 units, Aut (Sano)

111. Perspectives in North American Taiko
4 units, Spr (Sano, Uyechi)

NATIVE AMERICAN STUDIES

101. Introduction to Native American Studies
5 units (Simms)

103. Native American Women
5 units (Bomberry)

106. Native American Literature
5 units (Bomberry)

116. Language, Culture, and Education in Native North America
5 units (Nelson-Barber)

POLITICAL SCIENCE

25. Colonialism and Nationalism in the Third World
5 units (Abernethy) given 2001-02

104. Seminar: Urban Policy
5 units, Aut (Fraga)

117K. The Global Politics of Human Rights
5 units, Win (Karl)

118B. The Politics of Race and Class in Southern Africa
5 units, Aut (Abernethy)

125. The Rise of Industrial Asia
5 units, Aut (Oi, Okimoto, Oksenberg, Rohlen, Rowen)

133. Peace Studies
3 units, Spr (Bland, Holloway, Ross)

143F. Explaining Ethnic Violence
5 units, Win (Fearson)

158R. Children’s Citizenship: Justice across Generations
5 units (Reich) given 2000-01

159R. Ethics and Politics in Public Service
5 units, Win (Reich)

171. Judicial Politics and Constitutional Law: Civil Liberties
5 units (Staff) not given 2000-01
180. Seminar: Courts, Color, and the Constitution
5 units, Aut (Barker)

184W. Issues of Representation in American Politics
5 units, Win (Wong)

185. Seminar: Asian Americans in Politics
5 units, Spr (Wong)

186. Urban Politics
5 units, Aut (Fraga)

192F. Seminar: Politics of Race and Ethnicity in the United States
5 units (Fraga) not given 2000-01

196. Issues of Race in American Politics
5 units (Sniderman) not given 2000-01

197P. Seminar: Political Beliefs and Values of Black Americans
5 units, Win (Sniderman)

197S. Seminar: Prejudice and Group Conflict
5 units (Sniderman) not given 2000-01

218L. Seminar: Ethnicity and Nationalism in Soviet and Post-Soviet Politics
5 units (Lapidus) not given 2000-01

291F. Seminar: Urban Politics and Policy
5 units (Fraga) not given 2000-01

294. Graduate Seminar: Politics of Social Policy and Race
5 units, Spr (Wong)

296. Seminar: Racial and Ethnic Politics in the U.S.
5 units (Fraga) given 2001-02

PSYCHOLOGY

160. Culture and Self
1-3 units, Win (Markus) alternate years, not given 2001-02

161. Cultural Psychology
5 units, Spr (Markus)

174. African American Psychology
3-4 units, Aut (McCants)

175. Seminar on Topics in Identity Development
3 units, Win (McCants)

215. Mind, Culture, and Society
3 units, Win (Markus, Steele)

245. Social Psychological Perspectives on Stereotyping and Prejudice
4 units (Eberhardt) alternate years, given 2001-02

RELIGIOUS STUDIES

8. Religion in America
4 units, Spr (Busto)

53. Jews and Judaism in America
4 units (Eisen) not given 2000-01

143. Chicano/Latino Religious Traditions
4 units, Spr (Busto)

163. Religion and Ethnicity/Race
5 units, Win (Busto)

276. Topics in Religion and Race Seminar: Religion and Immigration
4 units, Win (Busto)

SOCIOLOGY

118. Social Movements and Collective Action
5 units, given 2001-02

120. Interpersonal Relations
5 units, Aut (Ridgeway)

138. American Indians in Comparative-Historical Perspective
5 units, Win (Snipp)

139. American Indians in Contemporary Society
5 units, Spr (Snipp)

140. Introduction to Social Stratification
5 units, Win (Granovetter)

145. Race and Ethnic Relations
5 units, given 2001-02

147A. Examining Urban Poverty
5 units, Win (Staff)

149. The Urban Underclass
5 units, Win (Rosenfeld)

151A. Asians in America: Trends and Issues
5 units, given 2001-02

312A,B,C. Workshop: Collective Action and Social Movements
1-5 units, given 2001-02

SPANISH

110N. Stanford Introductory Seminar: Introduction to Research in Chicana/o Literature and Visual Art
3-5 units, Aut (Yarbro-Bejarano)

112N. Stanford Introductory Seminar: The U.S.-Mexico Border Region in Film and Literature
3-5 units, Spr (Fox)

132. Mexican and Chicano Cultural Perspectives
4 units, Win (Gonzalez)

135. Caribbean Cultural Perspectives
4 units, not given 2000-01

143E. Latinos/as and Popular Culture in the United States
3-5 units, Win (Negron)

180E. Introduction to Chicana/o Cultural Studies
5 units, Win (Rosaldo, Yarbro-Bejarano)

203. History of the Spanish Language
3-5 units, Aut (Valdés)

206. Spanish Use in Chicano Communities
3-5 units, Spr (Valdés)

369. U.S.-Mexico Border Region
3-5 units, Win (Fox)

380E. Critical Concepts in Chicana/o Literature
3-5 units, Spr (Yarbro-Bejarano)

316
OVERSEAS STUDIES

These courses are approved for the CSRE major and taught overseas at the campus indicated. Students should discuss with their major advisors which courses would best meet individual needs. Descriptions are in the "Overseas Studies" section of this bulletin or at the Overseas Studies office, 126 Sweet Hall.

PUEBLA

104X. Cholula: The Workings of a Sacred City
3 units, Win (Knab)

CULTURAL AND SOCIAL ANTHROPOLOGY

Chair: Sylvia Yanagisako
Professors: Ian Hodder, Renato I. Rosaldo, Sylvia J. Yanagisako
Associate Professors: Carol L. Delaney, Akhil Gupta
Assistant Professors: Paulla Ebron, Miyako Inoue, Sarah S. Jain, Matthew Kohrman, Purmina Mankekar
Courtesy Professors: Penelope Eckert, Raymond McDermott
Lecturers: Sandra Lee, Christopher Matthews
Visiting Professors: Gustavo Politis, Ann Stoler, Izaly I. Zemtsovska
Visiting Assistant Professor: Tristan Carter
Affiliated Faculty: Susan Cashion, James A. Fox, Shirley Brice Heath, Barbara Koenig, Hazel R. Markus, Thomas P. Rohnen, Michael Shanks
Teaching Fellows: Kristin Bright, Amy Burce, Keila Diehl
Acting Instructors: Robin Balliger, Sameer Pandya, Adam Yue Chau
Teaching Affiliates: John Davis, Monica DeHart de Galicia, Aradhana Sharma, Bobby Vaughn

*Recalled to active duty.

The courses offered by this department are designed to: (1) provide undergraduates with instruction in cultural and social anthropology; (2) provide undergraduate majors in anthropology with a program of work leading to the bachelor's degree; and (3) prepare candidates for advanced degrees in cultural and social anthropology.

Cultural and social anthropology addresses a wide range of issues in the comparative study of society and culture. These include issues of race, class, national origin, gender, sexual orientation, and religion as they are shaped by the experiences of education, history, and migration through which people in past and contemporary societies have defined themselves in relation to others. The scope of cultural and social anthropology includes our own society and culture as well as those of other parts of the world, especially as these are drawn together and shape one another in increasingly transnational and global interactions.

The Department of Cultural and Social Anthropology offers a wide range of approaches to the various subfields and topics within anthropology including: archaeology, environmental anthropology, linguistics, medical anthropology, political economy, science and technology studies, and sociocultural anthropology. Methodologies for the study of micro- and macro-social processes are taught through the use of qualitative and quantitative approaches. Training is offered in ethnographic research; the collection and interpretation of oral histories, surveys, and archival materials; the analysis of material culture, including mapping, cataloging, and interpretation of material objects; and methodologies in the performative arts, including visual and performing studies. The department provides students with excellent training in theory and methods to enable them to pursue graduate study in any of the above-mentioned subfields of anthropology. Students interested in the biological and evolutionary approaches to anthropology are urged to consult the Department of Anthropological Sciences.

Note—The degree programs of the Department of Cultural and Social Anthropology became available in Autumn Quarter of 1999-2000. Students who declared their major in Anthropology in 1998-99 or in any previous year have the option of finishing their degrees under the guidelines and requirements of the former Department of Anthropology (see, for example, Stanford Bulletin 1998-99) or they may opt for the new guidelines and requirements outlined here. The choice of these options should be made in writing, with the faculty adviser's approval, and filed with the Cultural and Social Anthropology Student Program Coordinator.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The Department of Cultural and Social Anthropology (CASA) offers an A.B. degree in Cultural and Social Anthropology and an honors program. The major provides students with expertise for understanding social and cultural transformations from an international and cross-cultural perspective. In addition to gaining an excellent foundation for graduate research and study, students majoring in Cultural and Social Anthropology can pursue careers in government, international business, international development agencies, international education, law, mass media, non-profit organizations, and public policy.

Within the major, students may include course offerings in other departments such as Anthropological Sciences, Classics, Economics, English, History, Political Science, Psychology, and Sociology, as well as course offerings in programs such as African Studies, American Studies, Comparative Studies in Race and Ethnicity, East Asian Studies, Feminist Studies, Latin American Studies, Public Policy, and Urban Studies.

To declare a major in Cultural and Social Anthropology, students should contact the department's Student Peer Adviser or Student Program Coordinator. Both of these individuals can provide an application form (see below for deadline) and answer initial questions.

All undergraduate majors in Cultural and Social Anthropology must fulfill the following requirements:

1. A program of 65 units, with at least 40 units in Cultural and Social Anthropology. The remaining 25 units may be taken from courses in related departments, including Anthropological Sciences, or transferred from other anthropological study programs, such as overseas programs. The 65 units must form a coherent program of study and be approved by the student's academic adviser.

2. A grade of 'B-' or better in CASA 90. This course is required of all CASA majors and should be taken within a year of declaring the major or before the end of the junior year. It introduces students to anthropological theory and prepares them for upper-division courses in the department.

3. The units required for the CASA major must include at least one course in four of the following topical categories:
   a) Linguistic and Symbolic Anthropology (for example, CASA 7N; related courses that could be used include Anthropological Sciences 115, or Linguistics 73, 150, 159)
   b) Race and Ethnicity (for example, CASA 88, 88A, 150C)
   c) Feminist Anthropology (for example, CASA 132, 160)
   d) Globalization and Transnationalism (for example, CASA 83A, 87A, 133A,B,C, 134A)
   e) Science, Technology, or Medicine (for example, CASA 82, 85)
   f) Material Culture (for example, CASA 137, 138A, 174)

4. Students must choose a concentration, taking at least 15 units in three or more courses on one theme or topic. Concentrations can be defined by subject matter or cultural area. Some examples of themes for a
concentration are: cultural studies, economic development, kinship, mass media, material culture, migration and immigration, political economy, popular culture, race and ethnicity, religion, urban cultures, or a particular culture area, that is, Japan, Europe, Southeast Asia. Students must have areas of concentration approved by their advisers.

5. A minimum of 15 units must be in CASA seminars numbered 100 or above.

6. Competence in a foreign language beyond the first-year level. Such competence is usually demonstrated by completing a course at the second-year level with a grade of "B-" or better. The requirement may be met by special examination administered through the Language Center.

7. All CASA majors are encouraged to write a senior paper, based on library research or field research. Honors is by application only.

Up to 10 units of the CASA Area 1 track (Introduction to the Humanities 27A, B) may be counted toward the major. Students whose programs require non-English language study as part of a geographical or linguistics focus may ask their CASA adviser to approve up to 10 units of language courses toward the degree if such courses are at the second-year level and above, or are in a second non-English language. No more than 10 units of directed individual study may be counted toward the major, and may only be included among the 25 "related units" permitted for the major. All required units for undergraduate programs must be passed with a grade of 'C' or better, and not more than 10 (maximum of 5 units in CASA and 5 units in related subjects) of the required 65 units may be taken for a "satisfactory/no credit" grade.

Majors are strongly encouraged to develop field research projects. Research course work includes 95A, Postfield Research Seminar; and 96, Directed Individual Study. The department has summer field research grants available to support individually designed research projects.

It would be helpful for students to meet the chair of the Undergraduate Committee and/or the Undergraduate Peer Adviser for initial advice on choosing an appropriate faculty adviser in the department. In consultation with their faculty advisers, students must develop a coherent program of study for the major. Students are required to submit the application form for the major, including their completed proposed plan of study, to the Student Program Coordinator no later than the beginning of the Winter Quarter of the junior year.

Majors are required to meet with their advisers at least once every quarter. Each student’s progress towards fulfilling the major requirements is recorded in a file kept in the Student Program Coordinator’s office. It is the student’s responsibility to see that this file is kept up to date.

MINORS

In addition to electronically declaring on Axess, prospective Cultural and Social Anthropology minors need to meet with the department’s Student Program Coordinator in order to receive and fill out a Minor Planning Form and Checklist.

Requirements for the minor are:

1. Have a faculty adviser in Cultural and Social Anthropology (assistance may be obtained from the department’s Student Program Coordinator).

2. Complete 30 units of Cultural and Social Anthropology courses with a grade point average (GPA) of 'C' or better. Of those 30 units:
   a) A minimum of 15 units must be taken at or above the CASA 70 course level.
   b) A maximum of 5 units may be taken in Directed Individual Study.
   c) A maximum of 5 units may be taken in Independent Research.
   d) Up to 10 units may be transfer credits or taken for instructor-elected satisfactory/no credit grade. No units may be taken for a student-elected satisfactory/no credit grade.
   e) Introduction to Humanities 27A and 27B may be included.

Deadline for Declaring the Minor—Students must complete the declaration process (both Planning Form submission and Axess registration) by the last day of the quarter, two quarters prior to the degree conferral (for example, by the last day of Autumn Quarter if spring graduation is intended).

HONORS

The Honors Program in Cultural and Social Anthropology is open to all majors in the department. Students interested in obtaining honors in CASA should submit to the Student Program Coordinator by the end of the second week of the Winter Quarter of their senior year: (1) an application; (2) a paper; (3) a letter of recommendation from a faculty adviser; and (4) a transcript. The paper submitted could have been written in the Postfield Seminar or any other CASA course. Admission to the honors program requires at least a 3.5 grade point average (GPA) in the major and a 3.0 GPA overall. (In exceptional circumstances, students may request that the GPA requirements be waived by filing a petition with the Undergraduate Committee.) Students who have more than one "Incomplete" at the application due date are not be admitted into the honors program.

Candidates whose application to the honors program is approved by the Undergraduate Committee must complete all requirements for their major and submit an honors thesis no later than four weeks prior to the end of the quarter in which graduation is anticipated. The thesis is read by the candidate’s adviser and a second reader appointed by the Undergraduate Committee. Honors candidates must enroll in 95A (Research in Cultural and Social Anthropology) and 95B (Honors), up to a maximum of 10 units for each. Most honors projects involve a total of 10 to 20 units of coursework in 95A and 95B, no more than 5 of which can count towards the 65-unit degree requirement for the major.

GRADUATE PROGRAMS

University requirements for the degrees of Master of Arts and Doctor of Philosophy are described in the “Graduate Degrees” section of this bulletin.

MASTER OF ARTS

The Department of Cultural and Social Anthropology offers the A.M. degree to four groups of students: (1) Stanford undergraduates who enroll in the coterminous program; (2) Stanford graduate students taking advanced degrees in other departments or schools at Stanford; (3) Ph.D. students in Cultural and Social Anthropology who fulfill the A.M. requirements in the course of their work toward the Ph.D. degree; and (4) students who apply from outside of Stanford for entry into the terminal A.M. program.

Stanford students interested in the coterminous program and graduate students in other departments or schools at Stanford should review the “Graduate Degrees” section of this bulletin and consult with the student program coordinator in the department. Other prospective students should request application materials from Graduate Admissions, the Registrar’s Office. Successful applicants for the A.M. program usually enter Autumn Quarter. Applications from Stanford students are reviewed in Winter Quarter if received by January 1 and in Spring Quarter if received by April 15. Outside applicants must file their scores on the Graduate Record Examination.

Applicants whose ultimate goal is the Ph.D. degree should apply directly to the Ph.D. program. Students accepted for the terminal A.M. degree program cannot transfer to the Ph.D. program; they must reapply on the same basis as other Ph.D. applicants and in competition with other Ph.D. applicants. Ph.D. students who decide to take the A.M. on the way to the Ph.D. are governed by separate requirements described in the department’s Guide to the Ph.D. Program.

Graduate enrollment at Stanford for at least three quarters of full tuition is required of all candidates for the master’s degree, including coterminous students. A.M. students in Cultural and Social Anthropology must take a minimum of 45 quarter units in sociocultural anthropology beyond the undergraduate degree with a grade point average (GPA) of ‘B’ or better. Thirty-six of those units, which constitute the University minimum for the A.M. degree, must be at or above the 100-level, and 18 of the 36 must be in courses designated primarily for graduate students (typically at least at the 200 level). The department further requires at least 15 ad-
diotional units of sociocultural anthropology, taken at Stanford or elsewhere, constituting a minimum total of 60 units in anthropology. At the discretion of the department, the 15 additional units may have been taken in fulfillment of the undergraduate degree. Within the 45 units taken at Stanford, students must take Cultural and Social Anthropology 211, plus two additional grade-level seminars in the department. The remaining units may be made up of courses selected in consultation with the faculty adviser to meet the needs and interests of the student.

The A.M. program usually requires more than one year of study. However, full-time students entering the program with appropriate background can complete the A.M. program in one calendar year. To provide a meaningful A.M. program within a one-year period, advance planning of course work with an adviser is required.

A field or library research paper, read and approved by at least two departmental faculty members, must be presented. Ph.D. students in the department may submit the first-year paper in fulfillment of this requirement. Other A.M. students must submit a project proposal for the master's paper for approval. Coterminal students must obtain approval either by the end of the second quarter of the fifth year of study, or if earlier, by the end of the quarter preceding the quarter in which the degree is completed. All other A.M. students must do so not later than the end of the second quarter of graduate study.

**DOCTOR OF PHILOSOPHY**

Prospective graduate students should request application materials from Graduate Admissions, the Registrar's Office. Applicants must file a report of their scores on the Graduate Record Examination and submit a writing sample in English that demonstrates the ability to produce original analytical work at the graduate level. Successful applicants for the Ph.D. program may enter only in Autumn Quarter. The deadline for applications is January 4.

The Ph.D. program includes a number of required courses and examinations. It also allows the student to develop a flexible program reflecting special interests, under the supervision of a faculty committee chosen by the student. Students are encouraged to plan for completion of all work for the Ph.D. in five years.

The Ph.D. requirements for students who matriculated beginning 1999 are as follows (those matriculating earlier should consult the department's *Guide through the Ph.D. Program* for their cohort).

1. Pass within the first year, with a grade of 'B+' or better:
   a) At least three of the graduate-level courses in department designated by the faculty as theory/evaluation courses, including Cultural and Social Anthropology 210 and 211
   b) Cultural and Social Anthropology 212, Anthropological Research Methods
   c) At least 40 units of completed course work overall
2. In Spring Quarter of the first year, enroll and participate in the teaching apprenticeship practicum (CASA 298C).
3. Submit an acceptable, substantial research paper in the Spring Quarter of the first year.
4. During the second year, pass at a satisfactory level:
   a) Additional graduate-level theory/evaluation courses in the department to make a total of six such courses over the first two years of the program
   b) The Proposal Writing Seminar (CASA 294)
   c) At least 27 units of completed course work overall
5. Serve as a teaching assistant during the second year for three courses (or two courses if not on University financial aid). An approved internship may be substituted for one course of the teaching assistantship requirement.
6. By the end of Winter Quarter in the second year, recruit the special examination committee, and by the end of Spring Quarter in the second year, schedule examinations (see item 9, below).
7. For those whose native language is English, pass, by the end of Spring Quarter of the second year, a reading examination in a language other than English in which there is a substantial body of general theoretical literature relevant to anthropology. For those whose native language is not English, demonstrate satisfactory command of English, as evidenced by successful completion of the first two years of graduate study.
8. Upon completion of the above requirements, and upon recommendation of the Cultural and Social Anthropology faculty, petition for candidacy at the end of Spring Quarter of the second year or Autumn Quarter of the third year.
9. Pass a special examination (written and oral), before or during Winter Quarter (but in no case later than the fourth week of Spring Quarter) of the third year, covering the candidate's major topic of specialization and one major ethnological area of the world. The oral part of this examination is normally taken as the University oral.
10. Serve as a teaching assistant for one course in the third year if on financial aid (waived for those who complete all requirements above no later than Winter Quarter of the third year).
11. Prepare a dissertation proposal to be approved by the student's dissertation committee, and obtain needed research clearances before the end of Spring Quarter of the third year and before undertaking doctoral research.
12. Present an approved dissertation based on independent research.

**Ph.D. MINOR**

Prospective Ph.D. minors in Cultural and Social Anthropology should request an application from the CSA Student Program Coordinator. The requirements for a minor in Cultural and Social Anthropology consist of the following:

1. Complete 30 units of courses in the Department of Cultural and Social Anthropology at Stanford with a grade point average (GPA) of 'B' or better. Course work for a minor cannot also be used to meet requirements for a master's degree.
2. Enlist a faculty member within the Department of Cultural and Social Anthropology at Stanford who will provide written consent to serve as the adviser for the minor (see the Student Program Coordinator for a listing of faculty and office hours).
3. In conjunction with the adviser, determine a coherent course of study related to the Ph.D. program, including Cultural and Social Anthropology 211, two courses in theory, and one course in a geographical area (for a list of current theory/methods courses, see the Student Program Coordinator).
4. File the necessary paperwork with the Student Program Coordinator. Department of Cultural and Social Anthropology requirements listed above are more extensive than the University requirements.

**FINANCIAL SUPPORT**

The department endeavors to provide needed financial support (through fellowships, teaching and research assistantships, and tuition grants) to all students admitted to the Ph.D. program who maintain a satisfactory course of study. Applicants for the Ph.D. program must file a request for financial aid when applying to the program if they wish to be considered for support. First-year students in the Ph.D. program who have not entered with outside funding are required to apply for such funding during their first quarter. No financial support is available to students enrolled for the A.M. degree.

**TEACHING CREDENTIALS**

For information concerning the requirements for teaching credentials, consult the "School of Education" section of this bulletin or address the inquiry to the Credential Administrator, School of Education.

**COURSES**

(WIM) indicates that the course meets the writing in the major requirements.

**UNDERGRADUATE**

**GENERAL**

Open to all students, these courses are introductory in the sense that prior knowledge is not assumed. Students who want a general introduction to human behavior and culture are advised to take CASA 1; those...
who are interested in introductory courses focused on specific areas of anthropological inquiry should choose from among the courses numbered 2 through 18.

1. Cultural and Social Anthropology—(Upper-division students register for 101.) Cross-cultural anthropological perspectives on human behavior, including cultural transmission, social organization, sex and gender, culture change, technology, war, ritual, and related topics. Lectures, films, and readings present case studies illustrating basic principles of the cultural process. Student projects include data-collection, transcription, analysis, and consideration of theoretical implications, and connections to the existing literature. 5 units (Inoue) not given 2000-01

7N. Stanford Introductory Seminar: Investigating Culture—Preference to freshmen. Students compare and contrast their experience of entering the University with that of anthropologists entering another culture. The culturally specific ways that people situate themselves (and are situated) in space and time, by means of language, the structures of everyday life, and the global economy in terms of the body, and the symbols and frameworks provided by public myth and ritual. Classic anthropological readings, supplemented by weekly ethnographic exercises, enable students to become more deeply aware of culture as a constructed phenomenon that is open to investigation of its implicit premises and explicit forms. GER:3b (DR:2 or 9) 4-5 units, Aut (Delaney)

8N. Stanford Introductory Seminar: Narratives of Self and Society—Preference to freshmen. How people portray their lives, the factors that made them become who they are, the nature and impact of encounters with different worlds, and the ways they find meaning in their lives. How external factors, such as globalization, class, race, and migration shape people’s life stories. 5 units (Rosaldo) not given 2000-01

9. From the Age of Exploration to the Present: Latin America, Europe, and the U.S.—GER:1 (DR:1) (two-quarter sequence) 5 units, Win (Collier)

10. From the Age of Exploration to the Present: Europe and the U.S.—GER:1 (DR:1) (two-quarter sequence) 5 units, Spr (Balliger)

11C. Gender in Cross-Cultural Perspective—Anthropological theories of gender constructions. Recent questions posed to anthropologists about representation, power, and the interpretive authority of ethnographers, drawing on a range of resources (ethnography, film, fiction, and life stories). How gender is a lens through which other forms of social organization can be illuminated and how given theoretical tools act as framing devices for the kind of cross-cultural interpretation one makes. 5 units (Ebron) not given 2000-01

12. Introduction to Feminist Study—Understanding the creation and perpetuation of gender inequality. Topics: sexuality, reproduction, work, family, welfare, violence, language, and religion. Examples from non-western societies illuminate the cultural and historical construction of gender in western society. 5 units (Delaney) not given 2000-01

13. Critical Perspectives on Popular Culture—Introduces critical perspectives on popular culture, including Hollywood and Indian film, Latin American and U.S. soap operas, popular music, and video. Emphasis is on the historical, sociological, anthropological, and cultural studies perspectives on popular culture and mass media in cross-cultural contexts. Issues: the relationship between film and nationhood, television sitcoms and racial identity, soap operas and gender, and video and ethnicity. 5 units (Mankekar) not given 2000-01

15. Africa and the Diaspora—Lecture/discussion. Surveys the debates surrounding Africa and the diasporic communities. The cultural history offers insight into contemporary discussions about the culture and politics of these mapped cultural spaces. Methodological approaches set the context, providing basic analytic tools for research projects. GER:4a (DR:2) 5 units (Ebron) not given 2000-01

THEORY AND RESEARCH

90. Theory in Cultural and Social Anthropology—Anthropological interpretations of other societies contain assumptions about ourselves and about "Western" societies. Seminar highlights that interplay and considers how underlying assumptions and implicit categories have influenced the presentation of data in a set of major anthropological monographs. Emphasis is on Karl Marx, Emile Durkheim, Max Weber, and anthropological analyses of nonwestern societies. (WIM) 5 units, Win (Balliger)

93. Prefield Research Seminar—Prepares students for anthropological research in other societies and the U.S. Data collection techniques include participant observation, interviewing, surveys, sampling procedures, life histories, ethnobiography, and the use of documentary materials. Strategies of successful entry into the community, research ethics, interpersonal dynamics, and the reflexive aspects of fieldwork. Prerequisite: introductory course in anthropology or consent of instructor. 5 units, Spr (Davis)

94. Postfield Research Seminar—Undergraduates analyze and write about material gathered during summer fieldwork, emphasizing writing and revising as key steps in analysis and composition. Students critique classmates’ work and revise their own writing in light of others’ comments. Reading/discussion on ethical issues in fieldwork and ethnographic writing, setting research write-up concerns within broader contexts. Objective: produce an excellent ethnographic report based on original field research. 5 units, Aut (Rosaldo)

95A. Research in Cultural and Social Anthropology—Independent research conducted under faculty supervision, normally taken junior or senior year in pursuit of an honors program. May be taken more than one quarter for credit. Prerequisite: approved application to the honors program. 1-10 units, any quarter (Staff)

95B. Honors—Taken in the final quarter of the student’s work for graduation with honors. Independent study and honors thesis work for students admitted to the program. Prerequisites: acceptance to the honors program and a draft of the honors thesis. 1-10 units, any quarter (Staff)

96. Directed Individual Study—For undergraduate students with special needs, and showing the capacity to do independent work. Prerequisite: 1 or consent of instructor. 1-10 units, any quarter (Staff)

99A,B,C/199A,B,C. Honors/Masters Writing Workshop—(Graduate students register for 199.) For students in the process of writing honors’ or master’s papers. Techniques of interpreting data, organizing bibliographic materials, writing, editing, and revising. Preparation of
papers for conferences and publications in anthropology.

2-6 units, Aut, Win, Spr (DeHart de Galicia)

UNDERGRADUATE AND GRADUATE

AREA STUDIES

72. Dance and Culture in Latin America—(Same as Drama 168.)
3-4 units, Spr (Cashion)

73. Introduction to Chicano Life and Culture—Chicano culture in historical perspective, including indigenous and African negatives and comparisons with Mexico and other U.S. Latino groups. Emphasis is on the contemporary period and popular culture.
5 units (Rosaldo) not given 2000-01

5 units, Win (Mancall, Pandya)

76. Political Economy of India—The changing nature of relations of power in the Indian economy since British colonial rule. Conflicting interpretations of Indian economic history, the success of post-Independence development efforts, the relationship between agriculture and industry in contemporary India, and the position of the subcontinent in the world systems. Prerequisite: 120 or History 186.
5 units (Gupta) not given 2000-01

77. Japanese Society and Culture—Critical issues in the contemporary study of Japan. Topics: inequality, gender, ethnic minorities, personality theory, popular culture (animation, rap, music, and other), and the Western imagination of “Japan.” GER:3b,4a (DR:2 or 9)
5 units, Aut (Inoue)

82A. Introduction to Asian American Culture—(Enroll in Comparative Literature 168.)
5 units, Win (Palumbo-Liu)

83. Gender in South Asian Communities at Home and Abroad—The relationship between men and women in S. Asian communities. Gender relations in India, Pakistan, Bangladesh, Sri Lanka, Nepal, and overseas S. Asian communities (e.g., those in N. America, Africa, and the U.K.). Focus is on the relationship between the practices and ideologies of gender, and other social institutions (e.g., religion, family, state, mass media, and ideologies of communalism and nationalism). Prerequisite: 12 or consent of instructor.
5 units (Mankekar) not given 2000-01

83A. Korean American Diaspora—Examines Korean immigration to the U.S. using ethnographic, historical, and literary materials, and films. How are Korean American identities shaped by discourses on race and ethnicity, gender, colonialism, and religion? Employing the perspective of diaspora, examines issues of nation, home, community, and citizenship in the formation of these identities.
5 units, Aut (Lee)

84. The Multicultural City in Europe—European cities have become a kaleidoscope of peoples and cultures. What does multiculturalism mean in the European setting? How have different governments dealt with the issues, and with what results? The theoretical issues of migration, citizenship, and international labor as they affect people’s lives. How does culture affect how different groups utilize space and time, health, and educational resources? How do different notions of gender, family, work, religion, and food and clothing operate as symbols of identity? What are the politics of language? In what way does the city foster or mitigate difference?
5 units (Delaney) not given 2000-01

87. Social Change in Contemporary China: Remaking the Middle Kingdom—Seminar introduces anthropological methods through studies of social change in contemporary China. How are the economic liberalization and openness of post-Maoist shaping experiences for diverse groups in the People’s Republic? Focus is on changes to interpersonal relations; sex; medicine; shifts in gender, media, gift-giving practices; and rises in urbanization, migration, consumerism, and unemployment. GER:3b,4a (DR:2 or 9)
5 units, Win (Kohrman)

88A. Race and Ethnicity in Mexico—Race and ethnicity in modern Mexico, emphasizing notions of mestizaje, indigeneity, and blackness. The ways race has been understood throughout Mexican history, starting with the colonial encounter’s discourse on indigeneity. Early 20th-century nationalist discourses of mestizaje and indigenismo; the Afro-Mexican experience; and the role of race and ethnicity in current political mobilizations, e.g., the Zapatista rebellion.
5 units, Spr (Vaughn)

TOPIC COURSES AND SEMINARS

82. Anthropology of Medicine: Illness, Culture, and Health—Introduction to basic issues in medical anthropology through discussions of the ways ethnographers, health care professionals and local residents in Euroamerican and non-Euroamerican contexts have understood and responded to modes of bodily distress. Emphasis is on the ways gender, medical diversity, language, social status and cultural commodification mediate health care experiences in places like Haiti, China, South Africa, and Thailand. GER:3b,4a (DR:2 or 9)
5 units, Spr (Kohrman)

85. Trials of the 20th Century: Technology, Law and Culture—Notorious trials in the U.S. are used to examine key questions of technology, science, political movements, and the media. Through critical examinations of major tort cases, e.g., silicone breast implants, the Ford Pinto, and cigarettes, the ways consumer technologies are developed are examined in relation to their status as objects for sale, and what happens when these objects are considered injurious. How scientific evidence is shaped and stabilized by different parties in the legal context. The troubled interaction between the court and the technological innovations, e.g., the polygraph and DNA, and the burgeoning area of scientific expertise. GER:3b (DR:9)
5 units, Aut (Jain)

86. Environmental Politics and Development—How do global environmental problems affect developing countries? What is the relationship between environmental degradation, poverty, and population? Why the perspective of developing countries of the South differs from the industrial nations of the North, and what can be done to reconcile environmental concerns with the amelioration of poverty.
5 units (Gupta) not given 2000-01

5 units, Spr (Davis)

88. Theories of Race and Ethnicity: A Comparative Perspective—Introduces the concepts and theories of race and ethnicity in the social sciences and cultural studies. U.S.-based definitions, ideas, and problems of race and ethnicity are compared to those that have emerged in other areas of the world. GER:3b (DR:9)
5 units, Win (Yanagisako)
130A. Bioethics and Anthropology—(Enroll in Anthropological Sciences 174.) 5 units, Spr (Koenig)

132. Science, Technology, and Gender—Why do we think of engineering as a "masculine" profession? What have women's experiences been in entering fields of science and technology? How has gender been defined by scientists. Issues: the struggles of women in science to negotiate misogyny and cultural expectations (marriage, children), reproductive issues (surrogate motherhood, visual representations of the fetus, fetal surgery, breast feeding, child birth practices), how the household became a specific site of consumerism and technology, and the cultural issues at stake as women join the ranks of scientists. GER:3b,4c (DR:9?)

5 units, Win (Jain)

133A,B,C. Ethics of Development in a Global Environment (EDGE)—(Same as Engineering 297A,B,C.) Wednesday evening seminars on world affairs, mostly on issues affecting poor nations. Autumn Quarter treats war and peace: the background of current wars and peace negotiations, the UN peace keeping efforts, war and religion, arms trade. Winter Quarter treats international resources and commerce: the debt crisis, environmental protection, resource depletion, Japan in the world economy, aid and monetary institutions. Spring Quarter treats "poverty and prejudice": development models, comparative national health, AIDS, control of wealth, India-China-Africa-S. America today. Speakers from Stanford and other institutions are experts who directly deal with world policy makers through research and advisory activities. One unit credit for attendance of the speaker series; 3 units additional credit for optional workshops treating selected issues in more depth. (Sequential registration not required.)

1-4 units, Aut, Win, Spr (Lusignan, Gupta)

134A. The Anthropology of Development—Development as a modality through which cultural, political, and social transformations are engendered. Focus is on issues of identity formation, compliance and subversion, and community. Binary frameworks, e.g., tradition-modernity and local-global, show how these terms are not preconstituted givens, but formed in dialogue with each other in specific contexts.

5 units, Spr (DeHart de Galicia, Sharma)

136. The Anthropology of Consumption—Ethnographic historical approach to the study of consumption and its related topic, production. The social life of things are traced through interconnected processes addressing questions about the organization of labor that helps produce an object; contingencies of value and the making of consumer distinctions; and the role of advertising.

5 units (Ebron) not given 2000-01

137. Introduction to Skills in Archaeology—Introduces the skills used in archaeology to interpret the material traces of the past. The methods range from those used in the natural sciences to those used in the humanities. The integration of methods solve, e.g.: How old is this site? Who were these people? What did they eat? Who was dominant? What beliefs did they have? Training in archaeological skills, e.g., research design, dating methods, faunal analysis, botanical analysis, ceramic analysis, geology, geophysics, earth science, soil chemistry, osteology, genetics, statistics, geography, cartography, and geographic information systems.

GER:3b (DR:9)

5 units, Spr (Hodder)

139. Archaeology in the Modern World—Seminars on current issues in archaeological debates, bringing together information from other archaeology courses about theory, method, and data, and integrating these in relation to contemporary uses of the past in a variety of contexts. Focus is on the use of archaeological data in public spheres, conflicts over the past and the role of the archaeologist in such conflicts, museums and heritage centers, and the practical relevance of theoretical and methodological debate in the discipline.

5 units (Hodder) not given 2000-01

140A. Archaeology of Hunter-Gatherers in Latin America—The evolution of hunter-gatherer societies from the Late Pleistocene until the present, emphasizing the archaeological evidence, with ethnographic and ethnoarchaeological information used as a source of analogy. The pattern of adaptation and the ideological and symbolic aspects of the hunter-gatherers of the region. The peopling of Latin America, the evolution of hunter-gatherer societies during the Holocene, and contemporary hunter-gatherers of Latin America.

5 units, Spr (Politis)

145. Comparative Feminism—Preference to juniors and seniors majoring in Feminist Studies and anthropology. Interdisciplinary seminar for upper-level undergraduates. Women's struggles for empowerment, situating them in the specific cultural and historical contexts in which they have emerged in different parts of the world. Focus: broaden an understanding of women's struggles in the world, and develop analytical models that enable study of these struggles in their complexities and specificities by calling into question dominant assumptions about feminism.

GER:4c (DR:*?)

5 units (Mankekar) not given 2000-01

148. Latino Cultural Citizenship—Cultural citizenship refers to the right to be different and to belong in a participatory democratic sense. Readings are drawn from the historical experiences of Chicanos, Puerto Ricans, and Dominicans in the U.S. and from different disciplines including imaginative literature.

5 units (Rosaldo) not given 2000-01

150C. Introduction to Chicana/o Life and Culture—(Same as Spanish and Portuguese 180E.) Interdisciplinary examination of key literary and visual texts and issues in the chicana and chicano culture. (In English)

GER:3b,4b (DR:3 or 9)

5 units, Win (Rosaldo, Yarburo-Bejarano)

151A. Language in Society—(Enroll in Linguistics 150.)

4-5 units, Spr (Eckert)

152. Symbolic Anthropology—For undergraduates. Symbolic anthropology is an approach to the study of human society developed along with the concept of culture as a system of symbols and meanings, a system presumed to be embedded in and expressed by institutions, values, attitudes, structures of everyday life, and social action. The intellectual roots, exemplary texts, and opportunities to do symbolic analysis.

5 units (Delaney) not given 2000-01

153B. Millennialsim in the American Imaginary: From Columbus to the Present—See 253B. GER:3b (DR:9)

5 units (Delaney) not given 2000-01

154. Creation/Procreation: A Comparative Study—An alternative to the study of religion and reproduction as distinct categories and separate domains. The gendered aspects of cosmological or religious systems and the cosmological significance of gender in terms of their symbolic interrelationships. Anthropological and other literatures examine these relationships in several cultures, including our own. Emphasis is on the ways these beliefs are embedded in practices and structures of social life and on Western categories and meanings, and their implications for theorizing.

5 units (Delaney) not given 2000-01

155A. Magic, Ritual, and Religion—The development of anthropological approaches to magic, ritual, and religion from the early evolutionist and functionalist theories to the ascendance of symbolic analyses and the emergence of post-structuralist interpretations and ethnographies. How some key anthropological objects (e.g., the primitive mind, shamanism,
157. Shaman and Shamanism in Central Asia, Siberia, and the Russian Far East—Introduces the history of Shamanistic beliefs in Central Asia and remote regions of Russia: religious and everyday functions, shaman as phenomenon and persona, shamanistic acts as theater, shamanism and epics, music in shamanism, and medical aspects in shamanism (shaman as healer and hunter of souls).
5 units, Win (Zemtsovsky)

158. Culture and Learning—(Same as Education 287.) Learning in various institutional settings in the U.S. and around the globe. Learning in families, in schools, on the job, and on the streets. Emphasis is on the cultural organization of success and failure in American schools. Tentative consideration of opportunities for making less inequality.
3-4 units, Win (McDermott)

5 units (Delaney) not given 2000-01

174/274. Prehistoric Trade and Exchange—(Graduate students register for 274.) Current approaches to the study of trade and exchange in prehistoric/pre-capitalist societies. The scientific techniques employed in provenancing non-local stone, ceramic, metal and organic goods; alternative methods of sourcing (technological analysis, typology, etc.) Test-cases from archaeological and ethnographic literature examine how archaeologists explain the archaeological record.
5 units, Spr (Carter)

210. Reading Theory through Ethnography—Restricted to first-year doctoral students. Graduate seminar focusing on contemporary ethnography and related cultural and social theories generated by texts. Topics: agency, resistance, identity formation, discourse analysis, etc. Enrollment limited to 10.
5 units, Aut (Rosaldo)

211. History of Anthropological Theory—The history of cultural and social anthropology is studied in relation to historical and national contexts and to key theoretical and methodological issues as these continue to inform contemporary theory and practices of the discipline. Enrollment limited to 15. Prerequisite: consent of instructor.
5 units, Win (Delaney)

212. Anthropological Research Methods—Open to all graduate students; priority to Anthropology Ph.D. candidates. Introduces a range of research methods and modes of evidence building in ethnographic research. Enrollment limited to 10.
5 units, Spr (Lee)

5 units (Inoue) not given 2000-01

235. Mass Media and Subjectivities—Graduate seminar on critical approaches to mass media and popular culture. Object is to collaborate in developing methodologies and critiques and to interrogate prevailing theoretical perspectives. Emphasis is on feminist perspectives, national and transnational circulation and reception of popular texts, questions of narrativity, identity, agency, and cross-cultural conceptions of subjectivity.
5 units (Mankekar) not given 2000-01

243. Culture as Commodity—Graduate seminar focusing on theories of commodification, interests in tourism, national cultures as marketable objects, how identities are constituted through production and consumption. The formation of global style and taste.
5 units (Ebron) not given 2000-01

244. Naturalizing Power: Kinship/Gender/Race/Sexuality—Graduate seminar examines the discursive and material practices through which social relations of inequality are naturalized. Ideologies of family, kinship, gender, race, and sexuality are compared to consider the parallel processes of naturalization and mutual affirmation. The role of anthropological theory in these naturalizations. Enrollment limited to 20. Prerequisite: graduate student or advanced undergraduate major in anthropology, or consent of instructor.
5 units (Yanagisako) not given 2000-01

244A. Sex, Blood, and Representation—Against a background of traditional anthropological theories about gender, procreation, and kinship, explores the transformations that have occurred in the past 25 years. What is the significance of biology, cosmology, culture, and agency in the construction of these concepts and in the implications for practice in everyday life?
5 units, Win (Delaney)

245. Advanced Feminist Theory—Interdisciplinary graduate seminar examines cultural differences and recent feminist theory within dialogues of contemporary social theory. Enrollment limited to 20. Prerequisite: graduate student or advanced undergraduate major in anthropology, or consent of instructor.
5 units (Ebron) not given 2000-01

246. Feminist Perspectives on Globalization and Transnationalism—Graduate seminar examining how women in cross-cultural contexts are implicated by globalization and transnationalism, and how gender provides us with an indispensable lens for studying globalization and transnationalism. Issues: nationalism and citizenship, migration, mass media, circuits of labor in late capitalism, and new regimes of erotics and sexuality.
5 units (Mankekar) not given 2000-01

247. Feminist Methodologies—Interdisciplinary graduate seminar for students with a thorough working knowledge of feminist theories. Focus is on feminist epistemologies and methodologies, drawing on questions from feminists working at the intersection of feminist anthropology and cultural studies, and in political theory, film theory, history, and literary theory. Feminist negotiations of poststructuralism and postmodernism and interrogations of concepts such as difference, experience, fieldwork, location, and voice. Students think through readings by doing specific research, pedagogical, and community projects.
5 units (Mankekar) not given 2000-01

228A. Topics in Sociolinguistic Style—(Enroll in Linguistics 255A.)
1-4 units, Win (Eckert)

285. Politics of Language—Graduate seminar examining the relationship between language, power, and politics, drawing on specific case studies and contemporary developments in theoretical and political linguistics. Enrollment limited to 20.
5 units (Yanagisako) not given 2000-01
250. Nationalism and Gender—The co-implication of discourses of nationalism and gender, focusing on nationalist movements and ideologies in newly-independent countries and “Third World” contexts. Themes: discourses and practices of nationalism with institutions such as the state, mass media, and the family; masculinity, femininity, and militarization; and questions of representation, historiography, location, and strategy.

5 units (Manekar) not given 2000-01

250A. Gender, Race, and Colonialism: On the Politics of Knowledge—Multi-disciplinary seminar exploration of: feminist theory, the historiography of race, and colonial studies. Through readings of theoretically and methodologically important texts to each of these, examines their distinctive politics of knowledge and the ways in which these fields have mutually informed and transformed one another over the last 20 years.

3 units, Aut (Stoler)

251. Cultural Studies—Focus is on the politics of identity and community. Broader topics: questions on nationalism, displaced nationalism, and ethnicity. Interdisciplinary readings in cultural studies provide a theoretical context.

3 units (Rosaldo) not given 2000-01

251A. Latino Studies—Graduate seminar on issues concerning Latino and indigenous groups in the Americas, including racial formations, migration, nationalisms, and settler colonialism. Readings primarily from ethnography, social history, and personal testimony.

5 units (Rosaldo) not given 2000-01

252. Advanced Symbolic Anthropology—See 152.

5 units (Delaney) not given 2000-01

253. Religion and Society—Covers theoretical and ethnographic material, sensitizing students to the complexity of the issues involved in the study of religion. In what ways is it useful, or not useful, to talk of religion as a human universal? What is the nature of religion, how is it practiced and by whom, what counts as religious phenomena and what accounts for the persistence of religion and the power of religious movements? What is the relationship between religion and state and what are some issues blurring that distinction? What is the relation between religion, power, and gender? Prerequisite: consent of instructor.

5 units (Delaney) not given 2000-01

253B. Millennialism in the American Imaginary: From Columbus to the Present—(Advanced undergraduates register for 153B.) Since the “discovery” of America, the land and its destiny have been encompassed by a millennial/apocalyptic scenario. Columbus’ Book of Prophecies, pilgrims and pioneers, and contemporary religious millennial/apocalyptic groups use this scenario for: the interpretation of history, encounters with others, subjectivities and practices, and the construction of a national identity; and broadly raise theoretical issues of the relation between myth and history, subjectivity and identity, and the roots of globalization.

5 units (Delaney) not given 2000-01

254. Narrative, History, and Memory—Interdisciplinary graduate seminar on the debates surrounding theories of narrative and their relevance to ideas of history and memory. The importance of methodological implications of these approaches and their applicability to the analysis of social research, particularly anthropology and history.

5 units (Ebron) not given 2000-01

255. Cultural Citizenship—The right to be different and to be equal, and the political and the cultural issues at stake in this formulation. Readings on the U.S. and the politics of difference.

5 units (Rosaldo) not given 2000-01

257. Medical Anthropology—Graduate seminar examining the history and theories of medical anthropology. Focus is on medical anthropolo-
270. Tourism, Heritage, and National Identity—(Advanced undergraduates register for 170.) While anthropologists have been global travelers in their work, only recently have they turned their theoretical lens to tourists. Theories of tourism; tourism in relation to travel, pilgrimage, adventure; and different kinds of tourism and tourists. Their destinations, the creation and use of "heritage" sites as representations of a nation. The ways touring, itself, and heritage sites are involved in the construction and affirmation of a national identity.
   5 units (Delaney) not given 2000-01

272. Objectification: The Study of Material Culture—Theories of material culture and how the object world participates in social processes. The Hegelian and Marxist background and recent attempts to develop material culture studies between archaeology, anthropology, sociology, and psychology. Why are objects important to us? The relationships between conscious thought and daily material practice. The role of objects in thought and subjective experience. Objects in human evolutionary development and in child development. The nature of commodification. Objects in relation to power, authority, resistance; and in relation to the construction of self. The dependence of human subjectivity on the object world.
   5 units (Hodder) not given 2000-01

273. Introduction to Archaeological Theory—The history of archaeological thought, concentrating on debates that have dominated the discipline in recent decades. Evolutionary theories, behavioral archaeology, processual and cognitive archaeology, and approaches termed feminist and post-processual archaeology in the context of wider debate in adjacent disciplines, focusing on the application and integration of theory in working through archaeological problems and issues.
   5 units, Aut (Hodder)

   5 units, Spr (Carter)

275. Archaeology and Globalism—The emergence of archaeology as a discipline in the context of the rise of the nation state. The emergence of global economies and other global issues has created a new context for archaeology. How are archaeology and heritage responding to this new situation? The idea of "world heritage." The impact of postcolonialism. The commodification of the past: the past as theme park, as travel tourism or nostalgia, as exotic and other. Conflict between uses of the past for identity and as theme park; between heritage and resource or play. The impact of the Goddess, New Age, and other movements. Archaeology and human rights issues (including forensic archaeology).
   5 units (Hodder) not given 2000-01

280. Ethnographic Approaches to Cultural Diversity in Schooling—(Same as Education 280.) How to learn about culture and to analyze education-relevant situations such as the culturally diverse classroom. The cultural process is approached by acquiring techniques of observation, interview, and interpretation of behavior in context, and soliciting and recording the "native" explanations of their own behavior; developing an internally consistent conceptual structure that orients observation and elicitation productively; and being sensitized to one's own culture and how it influences perception and interpretation of behavior. Techniques of ethnographic research applicable to the study of schooling are demonstrated and applied in modest field research projects. Writing of one research report or proposal for research.
   4 units, Win (Spindler)

283. Anthropology of Disasters—Throughout the 20th century, natural and technological disasters became a major cultural and scientific preoccupation. The failures of the engineering miracle that was the Titanic, landslides and ecological havoc resulting from deforestation, and the intergenerational consequences of Chernobyl require students of science and technology to consider the circumstances under which technologies are fallible, how lines are drawn between natural and technological disasters, and how disasters affect segments of the population. Factors: e.g., the rise of engineering education and practice, economic needs for technological infrastructures, cultural fantasies about speed and progress, risk and fear.
   5 units, Spr (Jain)

   4 units, Spr (McDermott)

292. Dissertation Seminar—For graduate students in the process of writing dissertations and preparing for professional employment.
   0-3 units, Aut, Win, Spr (Kohrman)

293. Internship
   1-15 units, any quarter (Staff)

294. Proposal Writing Seminar—Required of Ph.D. students in anthropology in their second year. The conceptualization of dissertation research problems, the theories behind them, and the methods for exploring them. Participants draft a research prospectus of the sort suitable for dissertation proposals and research grant applications. Limited enrollment. Prerequisite: 212 or consent of instructor.
   5 units, Spr (Yanagisako)

295. First-Year Paper—Required of first-year students.
   2-5 units, Win, Spr (Inoue)

296. Research Assistantship—Supervised work with an individual faculty member on a research project. May be taken for more than one quarter.
   5 units (Staff)

297. Directed Individual Study—Opportunities for advanced students to explore special areas of interest.
   any quarter (Staff)

298. Teaching Assistantship—Supervised experience as assistant in one undergraduate course.
   5 units, any quarter (Staff)

299. A.M. Project—Research in connection with the master's paper.
   any quarter (Staff)

AFFILIATED DEPARTMENTAL OFFERINGS

AFRICAN AND AFRICAN AMERICAN STUDIES

105. Introduction to African and African American Studies
   5 units, Spr (McCants)

ANTHROPOLOGICAL SCIENCES

110. Introduction to Language Change
   4-5 units, Win (Fox)

111. Language and Prehistory
   5 units (Fox) not given 2000-01

115. Maya Hieroglyphic Writing
   5 units, Spr (Fox)

213. Topics in Linguistic Anthropology (Vocabulary and Culture)
   5 units, Aut (Fox)

CLASSICS

306. Archaeologies of the Contemporary Past
   5 units, Win (Shanks)
DANCE DIVISION

The Dance Division is dedicated to excellence in dance education and promotes the arts through a comprehensive liberal arts program. We provide a diverse range of courses and specializations in dance, including dance history, dance criticism, and dance performance. The faculty includes experienced dancers and scholars who bring a wealth of knowledge and expertise to the classroom.

The core program of Dance courses required of all majors includes:
- 1. Performance/Literature: 161, 162, and 163
- 2. Stage Management Project: 134, or 34 plus two of 39A,B,C or D
- 3. Senior Project: Drama majors must complete an approved Senior Project in the area of their specialization: a minimum of 2 units in Drama 200.

Two years of a college-level foreign language are strongly recommended.

All majors, in addition to completing the core described above, are required to complete one of the following seven specializations:

1. Acting:
   a) Drama 120A, B (Fundamentals of Acting)
   b) The student must have completed at least 4 units of Drama 29 and acted in at least two department productions.
   c) Drama 28 (Make-Up for the Stage)
   d) Any studio class in Dance
   e) Three additional acting classes
   f) One course in dramatic literature
   g) Six units of approved electives in Drama or Dance
   h) Two units from 39A, 39B, 39C, or 39D

2. Directing:
   a) Drama 170A (Introduction to Directing), 170B (Advanced Directing), and 171 (Undergraduate Theater Workshop)
   b) Drama 166 (Performance, Space, and Technology)
   c) One course in dramatic literature
   d) Drama 30 (Introduction to Theatrical Design)
   e) Drama 31 (Introduction to Lighting and Production)
   f) One course in acting
   g) Two units from 39A, 39B, 39C, or 39D
   h) Five units of approved electives in Drama

3. Playwriting/Dramaturgy:
   a) Drama 177 (Playwriting)
   b) Drama 170A (Introduction to Directing) and 170B (Advanced Directing)
   c) Drama 176 (Undergraduate Dramaturgy Project)
   d) Drama 166 (Performance, Space, and Technology)
   e) One course in dramatic literature
   f) Two courses in acting
   g) Two units from 39A, 39B, 39C, or 39D
   h) Four units of approved electives in Drama

4. Design:
   a) Drama 30 (Introduction to Theatrical Design)
   b) Drama 31 (Introduction to Lighting and Production)
   c) Two of Drama 131, 132, 133
   d) Two units from 39A, 39B, and 39C
   e) Two of Drama 231, 232, 233 or 235
   f) One course in acting
   g) Drama 166 (Performance, Space, Technology)
   h) Five units of approved electives in Drama or Art

5. Technical Production/Stage Management:
   a) Drama 30 (Introduction to Theatrical Design)
   b) Drama 31 (Introduction to Lighting and Production)
   c) One of Drama 131, 132, 133
   d) Two units from 39A, 39B, and 39C
   e) Drama 34 (Stage Management)
   f) One course in acting

The requirements for the A.B. degree in Drama are planned to integrate the critical and historical study of drama with the study and experience of performance. The major provides aesthetic and critical opportunities for students to develop special aptitudes. For example, a student may elect an emphasis in acting, directing, design, or critical theory, or may combine areas of emphasis. Examples of how students can structure their academic and professional career path will be discussed in this seminar. Students are encouraged to declare a major in their sophomore year.

The core program of Drama courses required of all majors is:
1. Performance/Literature: 161, 162, and 163
2. Stage Management Project: 134, or 34 plus two of 39A,B,C or D
3. Senior Project: Drama majors must complete an approved Senior Project in the area of their specialization: a minimum of 2 units in Drama 200.

Two years of a college-level foreign language are strongly recommended.

All majors, in addition to completing the core described above, are required to complete one of the following seven specializations:
1. Acting:
   a) Drama 120A, B (Fundamentals of Acting)
   b) The student must have completed at least 4 units of Drama 29 and acted in at least two department productions.
   c) Drama 28 (Make-Up for the Stage)
   d) Any studio class in Dance
   e) Three additional acting classes
   f) One course in dramatic literature
   g) Six units of approved electives in Drama or Dance
   h) Two units from 39A, 39B, 39C, or 39D

2. Directing:
   a) Drama 170A (Introduction to Directing), 170B (Advanced Directing), and 171 (Undergraduate Theater Workshop)
   b) Drama 166 (Performance, Space, and Technology)
   c) One course in dramatic literature
   d) Drama 30 (Introduction to Theatrical Design)
   e) Drama 31 (Introduction to Lighting and Production)
   f) One course in acting
   g) Two units from 39A, 39B, 39C, or 39D
   h) Five units of approved electives in Drama

3. Playwriting/Dramaturgy:
   a) Drama 177 (Playwriting)
   b) Drama 170A (Introduction to Directing) and 170B (Advanced Directing)
   c) Drama 176 (Undergraduate Dramaturgy Project)
   d) Drama 166 (Performance, Space, and Technology)
   e) One course in dramatic literature
   f) Two courses in acting
   g) Two units from 39A, 39B, 39C, or 39D
   h) Four units of approved electives in Drama

4. Design:
   a) Drama 30 (Introduction to Theatrical Design)
   b) Drama 31 (Introduction to Lighting and Production)
   c) Two of Drama 131, 132, 133
   d) Two units from 39A, 39B, and 39C
   e) Two of Drama 231, 232, 233 or 235
   f) One course in acting
   g) Drama 166 (Performance, Space, Technology)
   h) Five units of approved electives in Drama or Art

5. Technical Production/Stage Management:
   a) Drama 30 (Introduction to Theatrical Design)
   b) Drama 31 (Introduction to Lighting and Production)
   c) One of Drama 131, 132, 133
   d) Two units from 39A, 39B, and 39C
   e) Drama 34 (Stage Management)
   f) One course in acting
MINORS
- For students wishing to minor in Drama, the following core requirements must be met:
  1. The three-quarter sequence in Performance/Literature: Drama 161, 162, 163.
  2. Stage Management Project: 134, or 34 plus two of 39A, B, C, or D.
  3. A practical production class in technical theater or performance: one of Drama 29, 39A, 39B, 39C, or 39D.
  4. Elective courses totaling a minimum of 15 units from the specified courses in any one of the seven specializations listed above would constitute a minor concentration in: Acting, Directing, Playwriting/Dramaturgy, Design, Technical Production/Stage Management, Dance, or Performance Theory and Cultural Studies.

HONORS PROGRAMS

DRAMA
- For a limited number of students, the department confers the degree of Bachelor of Arts with Departmental Honors in Drama. To be considered for departmental honors, students must meet the following requirements:
  1. The student must have fulfilled the requirements for the Drama major.
  2. The student must be a Drama major in good standing with a grade point average (GPA) of 'B+' including all the student's work in Drama.
  3. The student must have completed prerequisite courses in the area of specialization with a GPA of 'A-' or better.
  4. The student must have completed a senior project that the Department of Drama considers outstanding.
  5. Honors are awarded on the basis of both the senior project and the student's entire work in the Department of Drama.

HUMANITIES
- An honors program in Humanities is available for Drama majors who wish to supplement their major with related and carefully guided studies. See the "Interdisciplinary Studies in Humanities" section of this bulletin for a description of the honors program. Students who enroll in this program may offer Humanities 160 and two seminars from 190-198 in fulfillment of the departmental elective requirement.

GRADUATE PROGRAMS

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. are described in the "Graduate Degrees" section of the bulletin.

All graduate study in the Department of Drama leads to the Ph.D. degree. The doctoral program in Drama aims to integrate practical theater work with the critical and historical study of dramatic literature and theory. All candidates are expected to function both as scholars and as theater directors. The curriculum offers a two-year practical concentration in directing along with the study of critical and performance theory, aesthetics, history, and literature. The goal of the program is to give students a thorough knowledge of the field that leads to original and significant scholarly work grounded in practice as well as an inventive directorial practice that is based on solid scholarly analysis.

The following department requirements are in addition to the University's basic requirements for the doctorate.

UNITS AND COURSE REQUIREMENTS

1. A minimum of 72 units of graduate courses and seminars in support of the degree. These units are in addition to units for the doctoral dissertation.
2. The sequence in Performance and Critical Theory (Drama 300, 301).
3. Six additional graduate seminars within the Department of Drama. These must include at least one seminar in each of the following fields: (a) intersections of theory and performance (designated by suffix A in course number); (b) theater history (designated by suffix B in course number); and (c) dramatic literature (designated by suffix C in course number).
4. The five workshops in directing: Drama 370, 371, 372, 373, 374. In the first year, students will take 370 (Concepts of Directing), 372 (Projects in Directing), 371 (Visual Aesthetics for the Director), and 373 (Directing and Dramaturgy). The Projects class consists of the conceptual development, design, and production of a short play in a multi-form space. In the second year, students take Drama 374 (Graduate Directors' Performance Project) to stage a more fully developed production chosen in consultation with the faculty.

LANGUAGE REQUIREMENT

The candidate must demonstrate reading knowledge of one foreign language in which there is a major body of dramatic literature. The language requirement may be fulfilled in any of the following ways:
1. Achievement of a sufficiently high score (70th percentile) on the foreign language examination prepared by the Educational Testing Service (ETS). Latin and Greek are not tested by ETS.
2. A reading examination given each quarter by the various language departments, except for Latin and Greek.
3. Passage with a grade of 'B' or higher a course in literature numbered 100 or higher in a foreign language department at Stanford.

The language requirement must be met before the student can be advanced to candidacy.

TEACHING REQUIREMENT

Six quarters of supervised teaching at half time are a required part of the Ph.D. program. The requirement is normally met by teaching three courses during the second year and three courses during the third year. It may include a fully produced staging of a full-length play.

EXAMINATIONS

Candidates must complete three examinations, one comprehensive and two qualifying examinations, by the end of the first three years of study at Stanford.

The comprehensive examination is taken as a four-hour sit-down in the Spring Quarter of the first year. The first part of the comprehensive exam is based on a range of texts given to the student by the department at the beginning of the first year. The second part of that exam is based on a list of texts from a given period determined by the student and faculty adviser. It may focus on texts or critical approaches of special interest to the student. Students who do not enter with a significant background in dramatic literature may opt to take this exam in the week prior to the start of classes in the second year.

The first qualifying exam, which must be completed before advancement to candidacy at the end of the second year, consists of three 15-25 page essays written in consultation with a faculty adviser, covering a specific period of dramatic literature and theater history. These essays should not duplicate any written work from seminars. One essay should deal with practical aspects of the period, e.g. directing; one essay should focus on theater history of the period; and one essay should focus on dramatic criticism related to a specific text of the period. After approval by the adviser, the Graduate Studies Committee reads and evaluates these essays.

The second qualifying examination is a departmental oral with three faculty members, at least two of whom should be from the Department of Drama. This oral covers a second period of dramatic literature and theater history. The format of this exam approximates that of the University Oral.

For the two qualifying examinations, the essays and the oral, each student will work out a program of study with a faculty adviser drawing from the following periods of Western drama, but may include non-Western texts:

- Classical
- Medieval and Renaissance
- 17th, 18th, and early 19th century
- Modern: 1870-1980
- Contemporary: 1980 to the present

SATISFACTORY PROGRESS

Graduate students in Drama are expected to make consistent progress toward the completion of the Ph.D. degree. At the end of the first year, the departmental Graduate Studies Committee evaluates the work of each student in classes, seminars, examinations, and in performance work. Continuation in the program depends upon the recommendation of this faculty group. At the end of the second year, the committee reviews the student's work in consideration of advancement to candidacy. At the end of the third year, students are expected to have developed an approved dissertation prospectus in preparation for the University oral.

APPLICATION FOR CANDIDACY

By the end of the second year of residence, the following requirements or appropriate equivalents must be completed:

1. Performance and Critical Theory sequence (Drama 300, 301) and four seminars
2. The directing workshop series (Drama 370-374), including the successful production of two works in public performance
3. A foreign language
4. At least two examinations

Based on its evaluation of the student's progress, the Graduate Studies Committee certifies the student's qualifications for candidacy. Upon favorable action, the student files formal application for candidacy, as prescribed by the University, by the end of Summer Quarter of the second year.

DISSERTATION PROSPECTUS

The dissertation prospectus must be approved by the candidate's adviser and by the departmental Graduate Studies Committee by the end of Spring Quarter of the third year.

UNIVERSITY ORAL EXAMINATION

The University oral examination, to be taken during the fourth year, is to demonstrate the candidate's ability to conduct significant research in the general area of the dissertation. The examining committee consists of four faculty members, at least two of whom must be from the Department of Drama, as well as one faculty chair from outside the department. The University oral covers the area of the dissertation and is based on the prospectus and bibliography of the candidate.

DISSERTATION

Normally, the Ph.D. program is completed in four years. The first year should be devoted to full-time graduate study, the second and third years to graduate study and teaching, the fourth year to writing the dissertation. Following formal admission to candidacy (typically at the end of the second year), the dissertation must be completed and approved within five years from the quarter in which candidacy is granted. A candidate taking more than five years is required to restate candidacy by repassing the written examinations on dramatic literature.

APPLICATION AND FELLOWSHIPS

Applicants for the Ph.D. program may write directly to the Department of Drama for information and to Graduate Admissions, Registrar's Office, Old Union, Stanford, CA 94305-3005, for an application. In addition to the required statement of purpose, all applicants must submit a statement detailing their practical theater experience, a sample of their written critical work, and a statement on directing. An interview, while not required, is recommended. Interviews are best scheduled after January 10 and before February 9. Graduate students in the Department of Drama begin study in the Autumn Quarter of each academic year; there are no mid-year admissions. All graduate students must be degree candidates. All admissions materials must be submitted to the Department of Drama, Memorial Auditorium m144, 551 Serra Mall, Stanford, CA 94305-5010 by December 15, 2000.

The Department of Drama awards a number of fellowships to students in the Ph.D. program.

FOR MORE INFORMATION

Write to the Department of Drama, Memorial Auditorium, m144, 551 Serra Mall, Stanford, CA 94305-5010 or telephone (650) 723-2576. The FAX number is (650) 723-0843. Email is et.jlf@forsythe.stanford.edu and the website is: http://www.stanford.edu/dept/drama/ where you may download the latest information in PDF format.

JOINT PH.D. IN DRAMA AND HUMANITIES

The Department of Drama participates in the Graduate Program in Humanities (GPH) leading to a joint Ph.D. degree in Drama and Humanities. For a description of that program, see the "Interdisciplinary Studies in Humanities" section of this bulletin.
The Committee on Black Performing Arts (CBPA) is an interdisciplinary program supporting the presence of Black art forms at Stanford. Started as a student project in 1968, the committee became an official University program in 1972. In 1997, the CBPA joined the Department of Drama as a division.

The CBPA functions as: (1) a liaison with departments in hiring faculty and devising courses in Black performing arts; (2) a presenter of professional performances in dance, drama and music, and film and symposia, framed by related academic study in anthropology, dance, drama, history, philosophy, and sociology; (3) a producer of student productions; and, (4) as a resource for student organizations promoting artistic expression in the Black cultural tradition. Through the cooperation of the departments, students are able to take relevant courses in dance, drama, literature, and music. While the offerings do not, at this time, constitute an academic minor, students are able to concentrate studies in Black performing arts as part of the A.B. major in African and African American Studies or Drama.

The CBPA publishes a journal, the Black Arts Quarterly (BAQ), three times a year. The BAQ is a forum for reflective explorations of Black performativity. It showcases original student work from campuses across the country and addresses the material impact of Black representation in the arts, in media, and popular culture.

The CBPA has developed a strong relationship with the city of East Palo Alto through the holding of artist residencies in the community and via "Dreams of a City: The East Palo Alto Project." The project incorporates commissioning plays, co-producing a video documentary and creating an archive about the community. The CBPA intends to continue its relationship with East Palo Alto in its future programming.

DANCE DIVISION

The Dance Division aims to develop trained bodies, inquiring minds, and aesthetic imaginations through movement as well as dance scholarship. The program emphasizes informed and active engagement in dance by stimulating a range of intelligences that honor somatic wisdom.

Since its inception in 1920, dance at Stanford University has positioned itself responsively to the changing needs of the university and society. It offers a range of studio and lecture courses aimed at enhancing the understanding of dance as a way to create and communicate knowledge and meaning. The program encourages students to make connections between dance, other disciplines, culture, and society.

UNDERGRADUATE PROGRAMS

Students who wish to major in Drama with a specialization in Dance, or minor in Dance, should see the undergraduate adviser, Susan Cashion, in the Dance Division.

MINORS

For students wishing to minor in Dance, the following core requirements must be met and a program of study arranged in consultation with the minor adviser in Dance.

1. Three of the following courses in theory: Dance 160, Dance, Gender, and History; 161, Dance and Live Art in the 20th Century; 168, Dance and Culture in Latin America; 197, Art and Community: Learning through Service in Dance; 242, The Work of Art and the Creation of Mind.
2. Drama 39D, Stage Management Project.
4. Additional choreographic experience: Dance 154, Dance Composition, or creating a work for Dance 100, Performance Workshop; Dance 106, Vintage Dance Ensemble, or another acceptable venue.
5. Studio courses totaling a minimum of 12 units. There must be a concentration of at least three classes chosen from a single dance form, with the other classes chosen from at least three other dance forms, and at least one class of dance performance (Dance 23, 27, 57, 100, 105, 150). A member of the dance faculty must confirm that the student has attained an appropriate level of proficiency in their areas of emphasis. The studio dance classes are from the series in: Modern Dance (Dance 40, 45, 140, 141, 165); Latin American Dance (Dance 42, 43, 56, 75); Jazz (Dance 44, 143, 144, 145); Social Dance (Dance 46, 146, 147, 156); Ballet (Dance 38, 48, 148, 149); and Acting (any class).

GRADUATE PROGRAMS

The A.M. degree in Education/Dance Specialization addresses the fundamental issues of how to nurture effective educational leadership in the performing arts. One major emphasis of the program is to develop strategies for revitalizing and refocusing teaching skills in response to changing societal needs. Values and ethics in education are examined through course work that focuses on artistic considerations of human development, the patterning of dance education in a cultural perspective, and teaching practices. To apply for admission to graduate study, successful completion of undergraduate courses in dance at Stanford, a bachelor's degree in dance from an accepted university or college, or proof of equivalent professional experience is required. For further information about the A.M. in Dance Education, contact the graduate adviser, Janice Ross.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

DRAMA DIVISION

Registration for most drama classes takes place at the first class meeting; further registration information is printed in the Time Schedule each quarter. Some class sizes are limited and require advanced registration in the Department of Drama, room 144, Memorial Auditorium.

INTRODUCTORY

3. Production Processes—Workshop, introducing the production process and preparation for creating a show. The role of the producer, from the hiring of the staff to the scheduling of a production, and that of the technical director.

1-2 units, Aut, Spr (Duxbury)

9,10. Performing the Past: Transformations, Revisions, and Subversions—Enroll in Introduction to the Humanities 22A.B.)

5 units, Win, Spr (Fordyce)

12N. Stanford Introductory Seminar: Antigone—From Ancient Democracy to Contemporary Dissent—Preference to freshmen. Sophocles' tragedy as evidence of the tensions inherent in the democracy of ancient Athens, the myth as a paradigm for modern philosophical and ethical approaches to social change, and a look at modern dramatic versions (Brecht, Anouih, Fugard, von Trotta) and essays (Hegel, Marx, Kierkegaard, Heidegger) that show how Antigone may be relevant to contemporary issues (the status of women, the struggle to save the environment, and resistance to illegitimate political authority). GER:5a,4c (DR:7f or 8f)

4 units, Aut (Rehn)

14N. Stanford Introductory Seminar: Contemporary German Drama from Brecht to Heiner Mueller—Preference to freshmen. Traces the movement from the modernist playwright Bertolt Brecht and the Berliner Ensemble to the postmodern theater of Heiner Mueller. GER:3a (DR:7)

4 units, Win (Weber)

15N. Stanford Introductory Seminar: The Shakespearean Era—Preference to freshmen. The visual forms (architecture, painting, sculpture, and costume) that expressed the cultural style of the Shakespeare
era. Dramatic texts, slides, and video. GER:3a (DR:7)
2 units, Aut (Eddelman)

17N. Stanford Introductory Seminar: (Re)Viewing Valdez in the Year 2000—Preference to freshmen. Readings, dramatic writing, and performance examine (from Chicana feminist, indigenous, and cultural nationalist perspectives) the actor, mitos, full-length plays, films, and philosophical thought developed by Luis Valdez, founding director of El Teatro Campesino, 1968-1998. GER:3a (DR:7)
3 units, Win (Moraga)

20. Acting: An Introduction—Theater games and physical exercises in concentration, attention, playing an objective, voice, movement, stage terminology, characterization, performing a monologue, and rehearsal techniques. Provides an experiential overview of actor training and prepares actors for advanced courses. Enrollment limited.
2 units, Aut, Win, Spr (Staff)

22. Scene Work—For actors who complete substantial scene work with graduate directors in the graduate workshop.
1-2 units, any quarter (Staff)

28. Make-up for the Stage—The basic techniques of make-up application for the artist and/or actor, which include aging, prosthetics, stylization, characterization, animals, and fantasy make-up.
2 units, Aut (Engelbrecht)

29. Acting in Performance—Students cast in department productions receive credit for their participation as actors; 1-2 units for graduate directing workshop projects and 1-3 units for major productions (units determined by instructor). May be repeated. Prerequisite: consent of instructor.
1-3 units, any quarter (Staff)

30. Introduction to Theatrical Design—Lecture/lab introducing the basic skills of visual communication used in stage productions. Design and construction methods for stage scenery, costumes, and lighting.
4 units, Aut (Guirguis)

31. Introduction to Lighting and Production—The technical and aesthetic aspects of lighting and the production process.
4 units, Spr (Ramsaur)

32. Textiles—Introduction to fabric techniques and processes for stage costumes.
3 units (Strayer) alternate years, given 2001-02

33. Drafting for the Theater—Lecture/lab, introducing the basic mechanical drawing techniques utilized by scenic and lighting designers. The basic pencil techniques through orthographic and isometric drawing, culminating with the technique of drop point perspective.
2 units (Guirguis) alternate years, given 2001-02

34. Stage Management Techniques—Survey lecture introducing the production process and the duties and responsibilities of a stage manager. Provides the skills needed to stage manage a production.
2-3 units, Aut, Spr (Duxbury)

35. Introduction to Sound for the Theater—Lecture/lab introducing the practical handling of sound equipment, acoustics, and editing. The analysis, creation, and implementation of theatrical sound effects, live and recorded.
3-4 units (Duxbury) alternate years, given 2001-02

36. Scene Shop Tutorial—Lecture/lab introducing the practical handling of shop equipment used in theatrical production.
1 unit, Win (Duxbury)

38. Scene Painting—Lecture/lab, introducing the basic skills of scene painting for the stage.
2 units, Spr (Guirguis)

39A,B,C,D. Theater Performance: Crew—Participation in the design and technical areas of department productions. Students commit to a specific show and receive credit for preparation and construction as a member of “running crew” in a specific area.
1-3 units, any quarter (Staff)

39A. Scenery and/or Property
39B. Lighting and/or Sound
39C. Costumes and/or Make-up
39D. Stage Management Prosser Project

42. Costume Construction—Lecture/lab, introducing the basic skills of constructing costumes for the stage.
2-3 units, Win (Strayer)

53. Greek Tragedy—(Enroll in Classics/Greek 12.)
3-5 units, Spr (McCall)

65. American Musical Theater: Broadway/Hollywood—As a unique and indigenous art form, American musical theater represents an important facet of American culture. Focusing primarily on Hollywood film musicals, explores technology, ethnicity, gender, concepts of romance, stardom, and developments in dance and musical forms as they change within the genre. Slides, recordings, and films. GER:3a (DR:7)
4 units, Aut (Eddelman)

INTERMEDIATE

38. Scene Painting—Lecture/lab, introducing the basic skills of scene painting for the stage.
2 units, Spr (Guirguis)

42. Costume Construction—Lecture/lab, introducing the basic skills of constructing costumes for the stage.
2-3 units, Win (Strayer)

113. Group Communication—Focus is on the interpersonal processes of communication as they relate to intergroup experience.
4 units, Win, Spr (Schroder)

120A,B. Acting: The Fundamentals—For students who intend to begin serious actor training. First quarter emphasizes the understanding and utilization of the basic vocabulary of objective and action. Theater games and improvisation develop the actor’s ability to act with focus, intention, and energy. Introduction to the basics of characterization and transformation. Second quarter: the actor’s spontaneity and imagination are used to reveal the life of a play (working with dramatic texts). Approaches to the actor’s craft range from character biography to moment-to-moment truthful playing. Exercises from Strasberg, Meisner, Chaiken, Linklater, and others. Scene and monologue work are drawn from primarily naturalistic plays. Outside rehearsal time required. Must be taken in sequence.
120A.
3 units, Aut (Freed)
Win (Ryan)

120B. Prerequisite: 120A or consent of instructor.
3 units, Win (Freed)
Spr (Ryan)

121C. Acting: The Craft of Comedy—The basics of comedy playing, from its origins in the utterly truthful to its destination in the over-the-top. Characterization, mask, and exaggeration; classwork on non-verbal scenes. The actor’s understanding of the mechanics of comedy, timing,
and clowning are developed through improvisation and in-class exercises designed to free the imagination. (Texts may include scenes from Feydeau, Woody Allen, Moss Hart, and Alan Ayckbourn.)

4 units (Freed) alternate years, given 2001-02

121E. Acting Modern Classics—Provides the actor with skills appropriate to the work of modern classical playwrights such as Ibsen, Strindberg, Chekhov, Brecht, Beckett and beyond. Script and character analysis—subtext, throughline of physical action, emotional honesty, and heightened language.

4 units, Aut (Mease)

121M. Playing the Monologue—Students preparing for graduate or professional training can benefit from this solo work. Acting alone provides a special challenge for the performer. Monologues may be found within a play or may be used as audition material. The particular conventions which apply to this art form.

3 units (Ryan) alternate years, given 2001-02

121P. Acting: Period and Style—Provides the actor with an approach to Classical, Expressionistic, and historically unfamiliar texts. Acting skills beyond the “Method” emphasize work on voice, language, and movement. Material is from Classical texts that have a strong formal “style” and from plays that have special demands based on theatrical time-period or genre. Scenes and monologues may include Shakespeare, Molière, Feydeau, Chekhov, and Shaw.

4 units (Freed) alternate years, given 2001-02

121R. Acting American Realism—Provides the actor with skills appropriate to the work of major American playwrights from Williams and Miller to Mamet and beyond.

4 units, Win (Freed)

121S. Acting Shakespeare Project—Intensive work on a shortened Shakespeare play leading to a studio performance project. Develops skills in understanding and performing Shakespeare, conducted as series of rehearsals, and culminating in group performance. The development of the voice, movement, and speaking skills necessary for demanding classical theater work. Prerequisites: 120A,B, or consent of instructor.

4 units, Aut (Freed)

121W. Actors Who Write/Writers Who Act—The development of dramatic scripts for solo performance and multi-character plays. Work happens “on its feet,” with regular writing deadlines and through an informal workshop environment in which students engage actively in the presenting scripts, with support and feedback in dramaturgy and help with performance and staging issues where appropriate.

4 units, Spr (Freed)

121X. Sexual Rites and Earth Rituals—An exploration of various seasonal resurrection myths, combining research and performance and culminating in an outdoor festival with puppetry, music, and pantomime. Significant outside rehearsal time.

3 units, Spr (Hunter, Lyons)

131. Lighting Design—Lecture/lab dealing with all of the practical and aesthetic aspects of lighting: electricity, light sources, color instrumentation, control, drafting, plotting, and the aesthetic principles of lighting design, interpretation, and concept. Prerequisites: 30, 31, or consent of instructor.

4 units, Aut (Ramsour)

132. Costume Design—A visual analysis of the historical styles of costume design, interpreted for the modern theater and developed by the student in various presentational media. Prerequisite: 30 or consent of instructor.

4 units, Spr (Strayer)

133. Stage Scenery Design—Creations of increasing complexity involve text analysis, historical and artistic style, visual research, spatial organization, drafting, sketching, model building, and director-designer collaboration. Prerequisite: 30, or consent of instructor.

4 units, Win (Guirguis)

134. Stage Management Project—For students stage managing a Department of Drama production.

2-9 units, any quarter (Duxbury)

135. Sound Design—All aspects of sound for the theater from equipment, acoustics, and editing to the creation of theatrical sound effects, live and recorded.

4 units, Win (Duxbury)

140. Project in Theatrical Production—Assistant directing; stage, costume, lighting, and sound design; technical production, stage managing, or other work in connection with Department of Drama productions. Prerequisite: consent of instructor.

1-5 units, any quarter (Staff)

155. Twentieth-Century American Drama—Issues of national identity, marginalization, and social exclusion arising from social movements such as Civil Rights, Black Power, Vietnam war protest, and feminism as presented in representative dramas by Suzan-Lori Parks, Anna Deavere Smith, and Tony Kushner, among others.

4 units, Spr (Wilmer)

156L. Introduction to Asian American Theater—Playwrights: Chin, Gotanda, Hwang, Houston, Lin, Ruo, Vong, Yamauchi, etc. Focus is on the history and politics of Asian American identity and experience, and on aspects of theatrical performance. Films and theater trips.

4 units, Aut (Lei)

158E. European Drama of the 20th Century—Survey of major dramatists (Pinter, Havel, Ionesco, Brecht, Mueller, etc.) focusing in the topic of mise en scène.

4 units, Spr (Apostolidès)

158F. Russian Modernist Theater: Naturalism, Expressionism, Symbolism, and Futurism—(Enroll in Slavic Languages and Literatures 152/252.)

4 units, Win (Bulgakowa)

158P. Gender and Performance: Performance and Performativity—Readings from J. L. Austin, Derrida, Butler, Barbara Johnson, Shoshana Felman, etc.

4 units, Spr (Phelan)

158R. History of Russian Theater—(Enroll in Slavic Languages and Literatures 154/254.)

4 units, Aut (Bulgakowa)

159A,B,C. Shakespeare—(Enroll in English 173A,B,C.)

4 units, Win (Parker) 4 units, Spr (Riggs)

159H. Seminar: Shakespeare and the Specter of Disorder—(Enroll in English 183A.)

5 units, Aut (Brooks)


5 units, Spr (Rehm)
162. Performance and the Actor—How an actor’s performance serves as a sign for class, race, and gender in various historical moments. Theories of acting (Diderot, Brecht, Artaud, Meyerhold, Stanislavski), play texts, and contemporary performances are used to examine the cultural mapping of the body on stage. Emphasis is on works that present culturally significant images of women. Readings from plays by Ben-musa, Brecht, Shakespeare, Kleist, Hansberry, Genet, Fornes, Strindberg, Chekov, Churchill, Kushner, Wertembaker. GER:3a (DR:7) (WIM)
   5 units, Win (Rayner)

163. Performance and America—Key dramas by women, men, Asian-Americans, Latino-Americans, and African-Americans are examined as to the role of dramatic performance within contemporary American society, and as an affective and effective arena for inducing social change. GER:3a,4b (DR:3 or 7) (WIM)
   5 units, Aut (Elam)

166. Performance, Space, and Technology—Theater history is analyzed through dramatic texts, slides, and videos to discover the ways in which performing styles, spatial evolutions, and technological advances express the cultural and social changes that are embedded in the theatrical event.
   4 units, Aut (Williamson)

170A. Introduction to Directing—Prerequisite: consent of instructor.
   4 units, Aut (Fordyce)

170B. Advanced Directing—Prerequisite: 170A or consent of instructor.
   4 units, Win (Fordyce)

171. Undergraduate Theater Workshop—Undergraduate directors present one-act plays in workshop performances. Credit is available for actors and directors. Prerequisite: 170A/170B or consent of instructor.
   1-4 units, Spr (Fordyce, Ramsaur)

176. Undergraduate Dramaturgy Project—Serve as a dramaturg on any department production. Research the production’s text source, the writing of program notes, the compilation and editing of the playbill, and possible adapting/editing of the performance text or translating text from a foreign language.
   2 units, any quarter (Staff)

177. Playwriting: Writing for Performance—The Fundamentals—The autobiographical monologic/poetic possibilities in Performance Art are explored to learn the elements of playwriting.
   5 units, Win (Moraga)

178. Intensive Playwriting—Opportunity to develop new material for the stage or complete a play-in-progress. Focus is on the most essential elements of playwriting, emphasizing the process of revision, and culminating in public readings of highlights of plays-in-progress. Prerequisite: prior experience in playwriting or consent of instructor.
   5 units Spr (Moraga)

179. Teatro America Workshop: The Theater of Native/Chicano America—(Enroll in Spanish and Portuguese 179.)
   5 units, Spr (Moraga)

180Q. Stanford Introductory Seminar: Noam Chomsky—The Drama of Resistance—Preference to sophomores. Focus is on the ideas and work of Noam Chomsky, who challenged the reigning political and economic paradigms governing the U.S. the last 30 years. Chomsky’s model for linguistics, Chomsky’s work in the U.S., S.E. Asia, the Middle East, Central America, E. Timor, the media, “terrorism,” ideology and culture, student/popular movements, and the role of resistance.
   3 units, Win (Rehm)

182Q. Stanford Introductory Seminar: Improvisation—The Jazz of Theater—Preference to sophomores. The new paradigm of improvisation as a “method” and as a developing art form. Readings on the theory of improvisation, compared and reinforced by attendance at performances of improvised theater in the Bay Area. Prerequisite: consent of instructor.
   3 units (Ryan) alternate years, given 2001-02

189Q. Stanford Introductory Seminar: Mapping and Wrapping the Body—Preference to sophomores. Investigation into the concepts behind gender boundaries and clothing systems. Prerequisite: consent of instructor.
   3 units, Spr (Eddelman)

190. Special Research—Individual project on the work of a playwright, period, or genre. Prerequisite: consent of instructor.
   1-5 units, any quarter (Staff)

191. Independent Research—Individual supervision of off-campus internship. Prerequisite: consent of instructor.
   1-18 units, any quarter (Staff)

ADVANCED COURSES
Courses numbered 200 through 299 are designed for advanced undergraduates and graduates.

200. Senior Project—See “Undergraduate Programs” for description.
   2-9 units, any quarter (Staff)

203. Advanced Improvisation—By audition only, become members of the Stanford Improvisers (SIMPS) group. Prerequisite: 103.
   3 units (Ryan) alternate years, given 2001-02

210A,B,C. The Actor in Performance—Preference to Drama majors and minors. Sequence provides a wide range of techniques and vocal training for the serious student who may be interested in further training in the performing arts. Guest-teachers from the professional theater contribute to the student’s practical work on Shakespeare and text, movement, characterization, and comedy. Limited enrollment. Prerequisite: interview with instructor.
   210A,B. 4-5 units, Aut, Win (Kostopoulos)
   210C. Prerequisite: 210A,B or consent of instructor.
   4 units, Spr (Freed)

213. Stanford Improv Ensemble—By audition only, for members of the improvisation troupe. Special project work. Prerequisite: 103. (AU)
   1-2 units, any quarter (Ryan)

231. Advanced Lighting Design—Individually structured class in lighting mechanics and design through experimentation, discussions, and written reports. Prerequisite: 131 or consent of instructor.
   1-5 units, any quarter (Staff)

232. Advanced Costume Design—Individually structured tutorial for costume designers. Prerequisite: 132 or consent of instructor.
   1-5 units, any quarter (Staff)

233. Advanced Scenery Design—Fast-paced, individually structured workshop. Prerequisite: 133 or consent of instructor.
   1-5 units, any quarter (Staff)

234. Advanced Stage Management Project—For students stage managing a Department of Drama production. Prerequisite: 134.
   2-9 units, any quarter (Duxbury)

235. Advanced Sound Design—Individually structured tutorial for sound designers. Prerequisite: 135 or consent of instructor.
   1-5 units, any quarter (Staff)
240. Project in Theatrical Production—See 140.
   1-5 units, any quarter (Staff)

242. The Work of Art and the Creation of Mind—(Enroll in Education 200.)
   4 units, Win (Hannah, Rehm, Ross, Sano)

255. Twentieth-Century American Drama—See 155.
   4 units, Spr (Wilmer)

256L. Introduction to Asian American Theater—See 156L.
   4 units, Any quarter (Staff)

258E. European Drama—See 158E.
   4 units, Spr (Apostolides)

258P. Gender and Performance: Performance and Performativity—See 158P.
   4 units, Spr (Phelan)

259. Shakespeare—(Enroll in English 273.)
   4-5 units, Spr (Riggs)

   5 units, Spr (Rehm)

262. Performance and the Actor—See 162.
   5 units, Win (Rayner)

263. Performance and America—See 163.
   5 units, Aut (Elam)

266. Performance, Space, and Technology—See 166.
   4 units, Aut (Williamson)

290. Special Research—Individual project on the work of a playwright, period, or genre.
   1-5 units, any quarter (Staff)

GRADUATE

For graduates; open to advanced undergraduates with consent of instructor.

300. Theories of Drama and Performance—Close study of the major theorists in the history of mimesis, stage and spectator, dramatic art, and political life from Aristotle and Plato through Kant, Rousseau, Lessing, and Nietzsche to Brecht, Burke, Barthes, Frye, and selected contemporary performance theorists.
   3-5 units, Aut (Mease)

301. From Theory to Criticism—Theater, performance, and performativity as theoretical concepts for interdisciplinary trends in critical studies. Performance theory as an arena in which to investigate the paradoxes of "interdisciplinarity" itself, focusing on how theories derived from the interdisciplinary arts, the social sciences, and literary and rhetorical studies. The contexts for engaged conversation or heated controversy, depending upon disciplinary heritage. Theater and performance in light of contemporary concerns in cultural studies, focusing on shared topics and methods, and on theatrical innovations in modes of scholarly representation.
   3-5 units, Win (Rayner)

308B. Seminar: Topics in Theater History—Classical Greece to the Beginning of the 19th Century—The stylistic evolution of theaters and staging from the classical period to the early development of Romanticism. Emphasis is on the ways theaters and staging reflect their own cultural and spatial environments.
   3-5 units, Aut (Eddelman)

309B. Seminar: Topics in Theater History—1800 to the 1980s—Emphasis is on innovation and experimentation as it developed in European and American theater, focusing on the aesthetic theories behind early Realism, Naturalism, Appia, Craig, the "isms," and scenography created by artists.
   3-5 units (Eddelman) alternate years, given 2001-02

   3-5 units, Win, Spr (Phelan)

319C. Seminar: Intercultural Theater—A historical and critical examination of intercultural theater from Ancient Greece to the contemporary world, including Asian theater. Interculturalism as a dramatic theme, theatrical representations, and theories of culture and performance, with theoretical emphasis on discourses of gender, ethnicity, and post-colonial and diasporic identity.
   3-5 units, Spr (Lei)

320. Basic Approaches to Teaching Acting—Workshop on the pedagogy of acting to prepare graduate student teachers for introductory classes in acting.
   1-3 units, Aut (Kostopoulos)

359C. Seminar: Shakespeare—(Enroll in English 373C.)
   4-5 units, Win (Parker)

370-374. Graduate Directing Workshop—The core curriculum for graduate students in directing. Prerequisite: consent of instructor.

370. Concepts of Directing—The basic directorial definitions of time, space, movement, and the performer/spectator relationship. Experimentation with texts chosen from literary and other sources, including works from the realistic tradition in drama, using a multi-form performance space.
   5 units, Aut (Weber)

371. Visual Aesthetics for Directors—Introduction to the concepts of stage, costume, and light design. Creative procedures, e.g., designing groundplans and elevations, building a model, sketching and swatching costumes, and practical work in the lighting lab.
   3 units, Win (Eddelman)

   5 units, Win (Weber)

373. Directing and Dramaturgy—Discussion/application of dramaturgy, directorial methods, and visual concepts in the production of plays from the Elizabethan tradition to postmodernist texts. Work on the text is tested in the staging of scenes.
   3-5 units, Aut (Weber)

374. Graduate Directors' Performance Project—Production of a full-length play, selected in consultation with faculty. Project is designed by graduate students, sometimes in collaboration with undergraduate design students, under the supervision of design faculty. Four to five weeks rehearsal. Public performance.
   3-5 units, any quarter (Ramsaur, Weber)
376. Graduate Directors' Dramaturgy Project—Serve as a dramaturg on any department production. Work includes research on the production's text source, the writing of program notes, and the compilation and editing of the playbill. Possible adapting/editing of the performance text, and translating text from a foreign language.

2 units, any quarter (Staff)

377. Graduate Directors' Staged Reading Project—Presentation of a new or newly adapted work for the stage, in a mode employed in professional theater for the development of new plays. Two to four rehearsals. Public performance.

2 units, any quarter (Staff)

390. Tutorial

1-9 units, any quarter (Staff)

391. Tutorial for the First Exam (Sit-Down)

1-2 units, any quarter (Staff)

392. Tutorial for the Second Exam (Essays)

1-4 units, any quarter (Staff)

393. Tutorial for the Third Exam (Oral)

1-2 units, any quarter (Staff)

399. Dissertation Research

1-9 units, any quarter (Staff)

BLACK PERFORMING ARTS DIVISION

Students are advised to consult the Time Schedule each quarter to note changes. See the Drama and the Dance Division of this bulletin for additional course listings and descriptions.

AFRICAN AND AFRICAN AMERICAN STUDIES

105. Introduction to African and African American Studies

5 units, Spr (Staff)

DANCE DIVISION

Registration for most dance classes takes place at the first class meeting; further registration information is printed in the Time Schedule each quarter. Some class sizes are limited and require advanced registration in the Dance office in Roble Gym.

Series classes (I, II, III) should be taken in order or with consent of instructor. Selected dance courses may fulfill General Education Requirements (GERs).

INTRODUCTORY

Open to all students. No previous dance experience needed.

38. Ballet Barre—Barre work, as the foundation for future work in classical ballet, grounding the beginning student in aspects of poise, precision, and placement.

1 unit, Aut (Ryan)

40. Modern Dance I—The technical and creative principles of modern dance, designed to develop the body as an articulate instrument.

1 unit, Aut, Win, Spr (Cashion)

42. Dances of Latin America—Selected dances of Latin America, specifically Argentina, Brazil, Chile, Colombia, Cuba, Mexico, Peru, and Puerto Rico. (AU)

1 unit, Aut (Cashion)

43. Afro-Brazilian and Afro-Peruvian Dance—Brazilian dance forms of the Northeast: Samba, Coco, Maculele, Bloco Afro. Peruvian dance of the coastal region: Festejo and Zamacueca.

1 unit, Aut (Cashion)

44. Jazz Dance I—Introduction to the basic techniques, with emphasis on current jazz style. Historical jazz steps are studied to enhance an understanding of contemporary jazz forms.

1 unit, Aut, Win, Spr (Kramer)

45. Improvisation plus Contact—The development of improvisation skills as a creative performance practice and as a basis for choreography; techniques of contact improvisation.

1 unit, Aut, Win, Spr (Kramer)

46. Social Dances of North America I—Introduction to the partner dances found in American popular culture: waltz, swing, tango, foxtrot, cha cha, salsa. Fee. (AU)

1 unit, Aut, Win, Spr (Powers)

48. Ballet I—Emphasis is on the fundamentals of classical technique: alignment, basic barre exercises, and movement sequences in the center and across the floor. (AU)

1 unit, Aut, Win (Ryan)

56. Argentine Tango—Emphasis is on leading/following and techniques of tango dancing. Styling, musicality, and other aspects of partnering. (AU)

1 unit, Spr (Staff)

69. Between Dance and Theater—Exploration of the moving body and visual composition as starting points for creating performance work that falls between acting and choreography, mostly through improvisation and the creation of small studies. Studio work incorporates vocalization, contact improvisation, and combing text with movement.

2 units, Win (Zack)

75. Mexican Dance and Folklore—For the novice dancer. Three forms of Mexican dance: regional/folklorico, popular/social, and religious, taught for technical and cultural understanding.

2 units, Win (Cashion)

INTERMEDIATE

Open to all undergraduates who have previous dance experience.

140. Modern Dance II—Intermediate technique. Introduction of improvisation and composition in directed studies.

1 unit, Win, Spr (Kramer)

143. Afro-American Roots of American Concert Dance—Traditional African and Caribbean dance forms and their influences on American concert dance performers of the 20th century. Reading materials and lectures support a dance historical approach.

2 units, Win (Moses)

144. Jazz Dance II—Intermediate level, emphasizing alignment, control, rhythmic coordination, and the learning of movement combinations.

1 unit, Aut, Spr (Moses)

146. Social Dances of North America II—Intermediate survey of the partner dances found in American popular culture: waltz, swing, Lindy Hop, tango, foxtrot, club two-step. Prerequisite: 46 or equivalent experience (20 hours of classes in waltz, swing, tango, and foxtrot).

1 unit, Aut, Win, Spr (Powers)

147. Living Traditions of Swing—In-depth instruction in swing dancing: the early Lindy of the 1920s; 6- and 8-count Lindy shag, street swing, and hustle. A foundation of partnering and improvisation is supplemented with advanced variations.

1 unit, Aut (Powers)

148. Ballet II—Intermediate level. Continuation of 48, repeating the fundamentals with increased complexity and introducing additional
movement vocabulary.

154. Dance Composition: The Practice of Making Dances—Students investigate movement material, compositional tools, and traditional and non-traditional methods of dance composition, leading to choreography. Structured as a participatory lab, class informs performance and compositional skills through an enhanced understanding of how dances are made.

3 units, Spr (Powers)

156. Social Dances of North America III—Advanced survey of the partner dances found in American popular culture: Hustle, Lindy Hop, tango, cha cha, salsa. Prerequisite: 146 or equivalent experience.

1 unit, Win, Spr (Powers)

153. Dance Heritage: History and Styles—Seminar on the origins of movement forms that have influenced Western contemporary dance, e.g., Duncan, Graham, Horton, Humphrey/Limon, Ailey, Cunningham. Specific approaches and techniques utilize cross-cultural and historical perspectives; studio work is amplified by lectures, films, and readings.

2 units, Aut (Plauche-Flink, Ross)


1 unit, Win (Frank)

145. Jazz Dance III—Advanced level of technical proficiency. Focuses on advancing the performance skills of projection and movement quality. Prerequisite: consent of instructor.

1 unit, Aut, Win, Spr (Moses)

149. Ballet III—Advanced level of classical ballet training.

1 unit, Win, Spr (Elliot)

PERFORMANCE

23. Public Performance—For students participating in movement oriented performance. (AU)

1 unit, Aut, Win (Kramer)

27. Faculty Choreography—Rehearsal and performance of faculty choreography. Selection by audition.

1 unit, Aut, Win, Spr (Staff)

57. Artist in Residence—Learn, explore, rehearse, and perform a suite of dances from Jose Limon's Modern Dance masterwork, "A Choreographic Offering." Participants must enroll in both quarters. Prerequisite: intermediate level dancing or consent of the instructor. Corequisite: intermediate/advanced ballet or Modern Dance.

2 units, Win, Spr (Plauche-Flink)

100. Performance Workshop—Explores and develops composition and performance skills. Required for participation in certain faculty and/or student-directed productions.

1 unit, Win, Spr (Kramer, Frank)

105. Grupo Folklorico Los Decanos—Dance material of Latin America (e.g., Folk, Carnival) is arranged for performance with a variety of performing experiences off and on the Stanford campus. Prerequisite: previous dance experience in Latin American forms, or consent of instructor.

1 unit, Win, Spr (Cashion)

150A,B,C. Ballet Repertory—Designed for students with at least one year of ballet. Learn, rehearse, and perform choreography from the classical and contemporary repertoire. Participants must enroll in all three quarters of sequence. Corequisite: 148 or 149.

1 unit (Elliot) alternate years, given 2001–02

THEORY

158. The Body in Motion—Approaches and methods in body therapy: body maintenance and conditioning, the Laban movement system, body-mind centering.

3 units (Staff) alternate years, given 2001–02

160. Dance, Gender, and History—Historical lecture/survey of Western theatrical dance, examining changing notions of gender construction and the body in dance over the last 200 years. Ballet and modern dance are looked at in the context of social and political events and as artistic developments and ideologies. GER:4c (DR:†)

3-4 units, Win (Ross)


3-4 units, Spr (Ross)

168. Dance and Culture in Latin America—(Same as Cultural and Social Anthropology 72.) Selected dance forms of Latin America are viewed as aspects of human behavior. Emphasis is on the cultural influences (European, African, and indigenous) which have shaped the ritual and social dance forms of Argentina, Brazil, Chile, Cuba, Mexico, and Puerto Rico.

3-4 units, Spr (Cashion)

169. Methodologies for Creation, Staging, and Reconstruction—Develops the skills and criteria for the choreographic process in dance. The work of invention, staging, and reconstruction in dance. Students are led through the creative process and practical considerations in making a dance work.

3 units, Aut (Powers, Moses)

190. Special Research—In-depth study of topics related to the discipline of dance.

1-5 units, any quarter (Staff)

191. Independent Research—Individual supervision of off-campus internship. Prerequisite: consent of instructor.

1-18 units, any quarter (Staff)

197. Art and Community: Learning through Service in Dance—Participatory seminar allows students to research the nexus of art and community, using the specific medium of dance to study how art affects self-perception and social development in female and male juvenile populations at risk. Students participate in service through the arts by developing a relationship to a specific population, by reading and reflecting on existing literature, and by hearing testimony from experts in the field.

4 units, Spr (Ross)

ADVANCED THEORY

Courses numbered 200 through 299 are designed for advanced undergraduates and graduates in the A.M. program.

241. Masters' Seminar: Issues in Dance Education—Required of first-year A.M. students in Dance Education. Introduction to the current issues and research concerning dance in education. Readings/discus-
242. The Work of Art and the Creation of Mind—(Enroll in Education 200.)
3 units, Win (Hannah, Rehm, Ross, Sano)

246. Dance Teaching Internship—The methodologies of teaching dance and using music resources within a variety of classroom situations. Instruction and guided practice in the preparation of lesson plans, developing sequence and progression in a class setting, and using accompaniment.
1-3 units, Win (Staff)

248. Graduate Design Project—Three part, individually designed creative project required for completion of the A.M. Degree in Dance Education.
5 units (Ross, Frank, Kramer)

290. Special Research—Individual project on the work of any choreographer, period, genre, or dance-related topic.
1-5 units, any quarter (Staff)

EAST ASIAN STUDIES

Director: Jean C. Oi
Affiliated Faculty:
Art and Art History: John D. La Plante (emeritus), Michael Sullivan (emeritus), Melinda Takeuchi, Richard Vinograd
Business: Henri-Claude de Bettignies
Comparative Literature: David Palumbo-Liu
Cultural and Social Anthropology: Harumi Befu (emeritus), Miyako Inoue, Matthew Kohrman, Sandra Lee
Economics: Masahiko Aoki, John J. Gurley (emeritus), Lawrence Lau
Education: Thomas Rohlen
History: Gordon Chang, Peter Duus, Harold L. Kahn (emeritus), Jeffrey Mass, Ellen Neskar, Roger Thompson, Lyman P. Van Slyke (emeritus)
Law: Stanley Lubman
Linguistics: Peter Sells
Philosophy: David S. Nivison (emeritus)
Political Science: John W. Lewis (emeritus), Daniel Okimoto, Jean Oi, Kurt Steiner (emeritus), Robert E. Ward (emeritus)
Religious Studies: Jacqueline Armijo-Hussein, Carl Bielefeldt, Judith Boltz, Bernard Faure, Gregory Schopen, Lee H. Yearley
Sociology: Andrew Walder

In addition to the courses in theActionCode: 000040000000000040, some students may take an additional 15 units of Asian Languages 91 (East Asian Civilization: Japan) or 92 (East Asian Civilization: China). The gateway courses are "The Historical Roots of Modern East Asia" offered in Autumn Quarter, East Asia in the Age of Imperialism offered in Winter Quarter, and Contemporary East Asia, offered in Spring Quarter.

The Center for East Asian Studies (CEAS) coordinates all University instructional, research, and special activities related to China, Japan, and Korea. Faculty and students who share a common interest in the study of East Asia are brought together by the center from a broad range of academic concerns covering nearly every discipline and historical period. In addition to supporting a wide variety of academic and extra-curricular activities on the Stanford campus, the center is also involved in programs that link the University’s resources on East Asia with civic groups, secondary schools, and local colleges in the San Francisco Bay area. As a National Resource Center designated by the Department of Education, Title VI, CEAS sponsors programs that provide opportunities for East Asian Studies faculty and students to meet and work with one another.

Further information may be obtained from the Center for East Asian Studies, Building 50, Stanford University, Stanford, California 94305-2034; telephone 650-723-3362, 723-3363; fax 650-725-3350.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The undergraduate major in East Asian Studies enables students to obtain a comprehensive understanding of East Asia broadly conceived, that is, the vast area stretching from Japan through Korea and China to the contiguous areas of the Central Asian landmass. Majors in East Asian Studies begin or complete the mastery of Chinese, Japanese, or Korean. Within the humanities or social sciences, they focus on a particular sub-region, for example, Japan, South China, Hong Kong and Taiwan; or, in addition to supporting a wide variety of academic and extra-curricular activities on the Stanford campus, the center is also involved in programs that link the University’s resources on East Asia with civic groups, secondary schools, and local colleges in the San Francisco Bay area. As a National Resource Center designated by the Department of Education, Title VI, CEAS sponsors programs that provide opportunities for East Asian Studies faculty and students to meet and work with one another.

Potential majors must submit a Student Proposal for a Major in East Asian Studies not later than the end of the first quarter of the junior year for approval by the East Asian Studies Subcommittee on the Bachelor of Arts program.

Majors must complete at least 75 units of course work on China, Japan, and/or Korea. Courses to be credited toward major requirements must be completed with a grade of ‘C’ or better. Specific requirements are:

1. Language: proficiency in Chinese, Japanese, or Korean language at the second-year level or above, to be met either by course work or examination. Students who meet the requirement through examination are still expected to take an additional 15 units of language at a higher level, or literature courses taught in the language, or the first year in an additional Asian language.

2. Gateway Courses: a minimum of two of the three gateway courses, or one gateway course plus Asian Languages 91 (East Asian Civilization: China) or 92 (East Asian Civilization: Japan). The gateway courses are "The Historical Roots of Modern East Asia" offered in Autumn Quarter, East Asia in the Age of Imperialism offered in Winter Quarter, and Contemporary East Asia, offered in Spring Quarter.

3. History: completion of at least two courses from one of the following course sequences:

- History 192A, 192B, 192C (Chinese History)
- History 194A, 194B, 194C, 194D (Japanese History)

4. Substantive Concentration: additional courses on East Asia, one of which must be a seminar.

5. Capstone Essay: completion of a paper of approximately 7,500 words, written either in a directed reading course or for one of the courses in item 4 above, which optimally would be built upon the student’s thematic interest. A 1-unit Spring Quarter course is required for all majors, in which they discuss and work through their senior theses.

Majors are encouraged to distribute their course work among at least three disciplines and two sub-regions in Asia. (The subregions need not be traditionally defined. Examples include China, Japan, or Korea; or,
in recognition of the new subregions which are emerging, South China, Hong Kong, and Vietnam; or Central Asia, Xinjiang, and Mongolia.) At least four courses must have a thematic coherence built around a topic such as:

Buddhism’s impact on East Asian cultures
Culture and society of modern Japan
Economic development in South China NETS (Natural Economic Territories)
Environmental issues of Asia
Fine arts and literature in late imperial China
Political economy of postwar Japan
Social transformation of modern China
Traditional Japanese civilization

An East Asian Studies course that satisfies the University Writing in the Major requirement (WIM) should be completed before beginning the senior essay. This year, Asian Languages 133 and 138, Political Science 115B and 29/129 satisfy the WIM requirement, as do most Department of History colloquia and seminars.

The courses for the major must add up to at least 75 units and all must be taken for a letter grade.

MINORS

The goal of the minor in East Asian Studies is to provide the student with a broad background in East Asian culture as a whole, while allowing the student to focus on a geographical or temporal aspect of East Asia. The minor may be designed by the following, for a total of six courses. All courses should be taken for a letter grade.

1. Two quarters of the gateway courses, The Historical Roots of Modern East Asia, East Asia in the Age of Imperialism, and Contemporary East Asia. One of the following may substitute for one quarter of the gateway courses:
   - Asian Languages 91, Traditional East Asian Civilization: China
   - Asian Languages 92, Traditional East Asian Civilization: Japan
   - Political Science 125, The Rise of Industrial Asia

2. A course in the History sequences 192 (China) or 194 (Japan).

3. One undergraduate seminar and two other courses from among those listed each quarter as approved for East Asian Studies majors, including literature courses but excluding language courses.

Applications for the minor are due no later than the second quarter of the junior year.

HONORS PROGRAM

Majors with a grade point average (GPA) of 3.25 or better in all courses related to East Asia may apply for the honors program no later than the final quarter of the junior year. Application entails submitting an honors prospectus to the student’s adviser for approval. Admission is granted by the subcommittee on the A.B. program, acting on the adviser’s recommendation.

Honors requirements are satisfactory completion of: (1) an honors thesis of high quality of approximately 10,000 words to be submitted in lieu of the senior essay otherwise required for the major, (2) 5 to 10 units of directed individual study in connection with the thesis project, and (3) one advanced level colloquium or seminar dealing with China, Japan, or both.

COTERMINAL DEGREE

The center admits a limited number of Stanford undergraduates to work for a coterminal A.M. degree in East Asian Studies. While the coterminal degree program permits admission to a graduate program as early as the eighth quarter and no later than the end of the eleventh quarter of undergraduate study at Stanford, the center accepts A.M. applications only once a year. Therefore, applications must be submitted by January 1. Applicants are expected to meet the same general standards as those seeking admission to the A.M. program: they must submit a written statement of purpose; a Stanford transcript; three letters of recommendation, at least two of which should be from members of the department of concentration; and scores from the General Test of the Graduate Record Exam. In addition, applicants must provide a list of courses they intend to take to fulfill degree requirements. The decision on admission rests with the A.M. Admissions Committee of the Center for East Asian Studies. Students must meet all requirements for both A.B. and A.M. degrees. They must complete a total of 15 full-time quarters (or the equivalent), or three full quarters after completing 180 units for a total of 217 units.

EAST ASIAN STUDIES (PAYSON J. TREAT) THEME HOUSE

EAST House, on campus at Governor’s Corner, is an undergraduate residence that houses 60 students and offers them a wide variety of opportunities to expand their knowledge, understanding, and appreciation of Asia. A member of the East Asian Studies faculty serves as resident fellow of EAST House. Assignment is made through the regular undergraduate housing draw.

KYOTO CENTER FOR JAPANESE STUDIES

Students interested in the study of Japanese language, history, culture, and social organization can apply to the Kyoto Center for Japanese Studies, a September-to-April program managed by Stanford that includes students from eight other American universities. Every Spring Quarter, the Stanford Center in Technology and Innovation, also at the Kyoto Center, offers an academic quarter focused on Japanese organizations and the political economy of research, development, and production of high technology and advanced industries. An internship in a Japanese firm, laboratory, or agency follows the training program. For information about Kyoto, contact the Overseas Studies office at Sweet Hall, telephone 650-723-3598.

GRADUATE PROGRAMS

MASTER OF ARTS

University requirements for the master’s degree are described in the “Graduate Degrees” section of this bulletin.

The A.M. program in East Asian Studies is designed both for students who plan to complete a Ph.D., but who have not yet decided on the particular discipline in which they prefer to work, and for students who wish to gain a strong background in East Asian Studies in connection with a career in nonacademic fields such as business, law, education, journalism, or government service. However, career-oriented students should realize that a master’s degree in East Asian Studies alone may often provide insufficient preparation for work in many professions, and they are advised to plan for additional professional training.

The master’s degree program allows a great deal of flexibility in combining language training, interdisciplinary area studies, and a disciplinary concentration. The director of the center assigns faculty advisers to all students. Members of the staff and faculty are available for academic and career planning. The A.M. program is normally completed in two academic years, but students can shorten this time by receiving credit for prior language work or by attending summer sessions. Students are urged to complete the degree requirements within one year if their background makes it possible.

Applications must submit scores for the General Test of the Graduate Record Examination. Foreign applicants are also required to take the Test of English as a Foreign Language. Applications for admission and financial aid may be obtained by writing to Graduate Admissions, Old Union, Stanford University, Stanford, California 94305-3005. The deadline for completed applications for admission and financial aid is January 1.

The basic requirements for the A.M. degree in East Asian Studies are as follows:

Language Requirement—Students must complete the equivalent of Stanford’s first three years of language training in either Chinese, Japanese, or Korean. Students entering the program without any language preparation should complete first- and second-year Chinese, Japanese, or Korean within the first year of residence at Stanford. This will necessitate completing a summer language program. Language courses taken at Stanford must be for letter grades.
The language requirement may be satisfied in part or in full by placing into an appropriate Stanford language class through the language proficiency exam given by the Department of Asian Languages. Students who fulfill this minimum three-year language requirement before completing other requirements are encouraged to continue language study, or take courses in which Chinese or Japanese are used, for as long as they are in the program. Language courses beyond the third-year level may be applied to the Area Studies requirement discussed below.

Students in the A.M. program are eligible to apply for the Inter-University Language programs in Taipei, Beijing, and Yokohama. For further information, see the "Institute for International Studies" section of this bulletin. Work completed in one of these programs may be counted toward the A.M. degree's language requirement. Students may petition to have advanced work counted for a maximum of three out of the nine area studies courses required for the degree.

**Area Studies Requirement**—Students must complete the 1-unit core course, East Asian Studies 330, and an additional nine courses numbered 100 or above related to East Asia. A total of 37 units beyond the courses used to fulfill the third-year level language requirement is required for the degree. (Chinese and Japanese language courses numbered 100-199 are considered to be at the third-year level and do not count toward the courses required for the degree.) The nine courses must be 3 or more units each and be taken for a letter grade. At least 18 units must be designated primarily for graduate students (typically at the 200 level).

An integral part of the program is training in research and a demonstration of research ability in a discipline. Three courses, one of which must be a seminar, colloquium, or advanced course in which a research paper on China or Japan is written, must be within a single department. The six additional area courses may be taken in departments of the student's choosing. Some theory-oriented or methodological courses may be used to meet part of these requirements provided they are demonstrably useful for understanding East Asian problems. Except in unusual circumstances, credit toward the Area Studies requirement is not given for courses taken before entering the A.M. program. Students in this program may, however, take courses for exchange credit at the University of California, Berkeley, with the approval of their adviser and the Office of the Registrar. In any case, Stanford University requires the payment of three full quarters of tuition for a University degree to be granted.

**A.M. Paper Requirement**—A master's paper, representing a substantial piece of original research, should be filed with the center's program office as part of the graduation requirements. With the adviser's approval, the master's paper requirement may be satisfied by expanding a research paper written for an advanced course.

### DUAL DEGREE PROGRAMS

#### EAST ASIAN STUDIES AND LAW

This joint program grants an A.M. degree in East Asian Studies and a Doctor of Jurisprudence (J.D.) degree. It is designed to train students interested in a career in teaching, research, or the practice of law related to East Asian legal affairs. Students must apply separately to the East Asian Studies A.M. program and to the Stanford School of Law and be accepted by both. Completing this combined course of study requires approximately four academic years, depending on the student's background and level of training in Chinese or Japanese.

#### EAST ASIAN STUDIES AND EDUCATION

This joint program grants an A.M. degree in East Asian Studies and a secondary school teaching credential in social studies. To be eligible for this program, students must apply to the A.M. program in East Asian Studies and then apply to the Stanford Teacher Education Program during the first year at Stanford. Completing the joint program requires at least two years, including one summer session when beginning the education component of the program.

#### EAST ASIAN STUDIES AND BUSINESS

This joint program grants an A.M. degree in East Asian Studies and a Master of Business Administration degree. Students must apply separately to the East Asian Studies A.M. program and the Graduate School of Business and be accepted by both. Completing this combined course of study requires approximately three academic years (perhaps including summer sessions), depending on the student's background and level of training in Chinese or Japanese language.

### EAST ASIAN STUDIES AND HEALTH SERVICES RESEARCH

The M.S. degree in Health Services Research (HSR) is an interdisciplinary program training students in research and analytic skills for careers in the growing health industry as innovative health planners, systems analysts, and policy-makers. Students concluding the first year of graduate study at Stanford are eligible to apply for the degree, which is granted by the Department of Health Research and Policy in the School of Medicine. The degree may be pursued concurrently with the second and subsequent years of graduate study and is awarded on completion of 45 units of course work. This work is to be split approximately equally between research workshops and formal courses relevant to the health sector. Each student's program is planned to meet individual interests in health services, in addition to fulfilling HSR core requirements. For more information, apply to the Program Administrator, Division of Health Services Research, Health Research and Policy Building, Stanford, CA 94305.

### DOCTORAL PROGRAMS

Stanford does not offer a Ph.D. in East Asian Studies. However, there are more than 100 doctoral students with a specialization on China or Japan within various departments and schools of the University. The departments that offer an East Asian concentration are: Anthropological Sciences, Art and Art History, Asian Languages, Comparative Literature, Cultural and Social Anthropology, Economics, History, Linguistics, Philosophy, Political Science, Religious Studies, and Sociology. It is also possible to specialize in East Asia within some of the doctoral programs of the professional schools of Business, Education, and Law. Inquiries should be directed to the individual department or school concerned.

### FINANCIAL AID

Students in A.M. or Ph.D. programs who plan to do work in Chinese or Japanese language, and language-related area courses, may be eligible for Foreign Language and Area Studies (FLAS) fellowships and are encouraged to apply for them at the time of application to Stanford. Recipients of FLAS fellowships must be American citizens or permanent residents. For further information, contact the FLAS Grant Administrator, Building 50, Stanford, California 94305-2034.

### COURSES

The courses listed below deal primarily with China, Japan, and/or Korea. Many other theoretical and methodological courses within the various departments at Stanford are taught by faculty who are East Asian specialists; these courses often have a substantial East Asian component and may be found under the department listings in this bulletin.

#### UNDERGRADUATES, GATEWAY

75. The United States and East Asia
   5 units, Win (Chang, Duus)

92A. The Historical Roots of Modern East Asia—(Enroll in History 92A.)
   5 units, Aut (Kahn)

92B. East Asia in the Age of Imperialism—(Enroll in Political Science 28, History 92B.)
   5 units (Duus, Oksenberg) not given 2000-01

92C. Contemporary East Asia—(Enroll in Political Science 29.)
   5 units, Spr (Staff)
ADVANCED

198. Senior Colloquium in East Asian Studies
   1 unit, Spr (Oi)

330. Graduate Core Seminar: Issues and Approaches in East Asian Studies
   1 unit, Aut (Staff)

AFFILIATED DEPARTMENT OFFERINGS

ANTHROPOLOGICAL SCIENCES

7. Marriage and Kinship
   5 units, Win (Wolf)

125A. 20th-Century Chinese Societies
   5 units, Spr (Gates, Wolf)

125B. Late Imperial China
   5 units, Aut (Gates, Wolf)

126. Formosa: An Introduction to Taiwanese History, Culture, and Society
   3-5 units, Spr (Chau)

150. Population and Society
   5 units (Wolf) not given 2000-01

220. China for Social Analysts
   5 units (Gates) not given 2000-01

ART AND ART HISTORY

2. Art and Culture in Asia
   5 units, Win (Vinograd)

180/380. Chinese Art and Culture
   4 units (Vinograd) not given 2000-01

186/386. Theme and Style in Japanese Art
   4 units, Aut (Takeuchi)

187/387. Arts of War and Peace: Late Medieval and Early Modern Japan, 1500-1868
   4 units, Spr (Takeuchi)

188/388. Painting in Late Medieval and Early Modern Japan, 1500-1868
   4 units (Takeuchi) not given 2000-01

   4 units, Aut (Vinograd)

283. Seminar: Court and City—Pictorial Art in Qianlong Period China
   4 units, Spr (Vinograd)

   4 units, Spr (Takeuchi)

287. Colloquium: “Pictures of the Floating World”—Images from Japanese Popular Culture
   4 units, Aut (Takeuchi)

288A. Seminar: Nostalgia in Japanese Art—Revivals, Reforms, Representations
   4 units (Takeuchi) not given 2000-01

289. Colloquium: Arts of Zen Buddhism
   4 units (Takeuchi) not given 2000-01

ASIAN LANGUAGES

51/151. Japanese Business Culture
   3 units, Win (Dasher)

71N. Stanford Introductory Seminar: Language and Gender in Japan—Myths and Reality
   3 units, Win (Matsumoto)

73/173. Chinese Language, Culture, and Society
   4 units (Sun) not given 2000-01

75A. Visible Bodies, Unseen Bodies—Body and Ethics in Japanese Films
   4 units, Aut (Kuge)

78A. Chinese Cinema: The Fifth Generation
   4 units, Aut (Chou)

91. Traditional East Asian Civilization: China
   5 units, Aut (Liu)

92. Traditional East Asian Civilization: Japan
   5 units, Win (Hare)

95. The Japanese Language in Culture and Society
   4 units (Matsumoto) not given 2000-01

114. Haiku
   3 units (Staff) not given 2000-01

115. History of Japanese Popular Culture
   4 units, Spr (Reichert)

131/231. Chinese Poetry in Translation
   4 units, Win (Liu)

132/232. Chinese Fiction and Drama in Translation
   4 units, Spr (Schaberg)

133/233. Modern and Contemporary Chinese Literature in Translation—(WIM)
   4 units, Win (Lyell)

133A/233A. Introduction to Modern Chinese Literature
   4 units (Sang) not given 2000-01

135/235. Classic Japanese Drama
   4 units, Aut (Hare)

   4 units, Spr (Wallace)

137/237. Classical Japanese Fiction in Translation
   4 units (Staff) not given 2000-01

138/238. Modern Japanese Literature in Translation—(WIM)
   4 units, Win (Reichert)

141. Chinese Mythology and Lyrical Imagination
   4 units (Liu) not given 2000-01

181. Japanese Women Writers
   4 units (Staff) not given 2000-01

187/287. Romance, Desire, and Sexuality in Modern Japanese Literature
   4 units (Reichert) not given 2000-01
Students registering for the first time in a first- or second-year course must take a placement test if they have had any training in Chinese before entering Stanford. Sign up for a section in the department office before the quarter begins.

1,2,3. First-Year Modern Chinese
5 units, Aut, Win, Spr (Leung, Zeng, Staff)

1B,2B,3B. First-Year Modern Chinese for Bilingual Students
3 units, Aut, Win, Spr (Rozelle, Chu)

5. Intensive First-Year Modern Chinese
8 units, Sum (Staff)

6,7,8. Beginning Conversational Chinese
2 units, Aut, Win, Spr (Rozelle, Yu)

10,11,12. Beginning Southern Min (Taiwanese) Conversation
2 units, Aut, Win, Spr (Lin)

21,22,23. Second-Year Modern Chinese
5 units, Aut, Win, Spr (Chung, Staff)

21B,22B,23B. Second-Year Modern Chinese for Bilingual Students
3 units, Aut, Win, Spr (Zhu)

25. Intensive Second-Year Modern Chinese
8 units, Sum (Staff)

27,28,29. Intermediate Chinese Conversation
2 units, Aut, Win, Spr (Wu)

51. Chinese Calligraphy
1-2 units, Win, Spr (Chuang)

CHINESE/ADVANCED

101,102,103. Third-Year Modern Chinese
5 units, Aut, Win, Spr (Chu)

101B,102B,103B. Third-Year Modern Chinese for Bilingual Students
3 units, Aut, Win, Spr (Chu)

105. Intensive Modern Chinese
8 units, Sum (Staff)

121,122,123. Advanced Chinese Conversation
2 units, Aut, Win, Spr (Chung)

125/205, 126/206, 127/207. Beginning Classical Chinese
5 units, Aut, Win, Spr (Sun)

3-4 units, Aut, Win, Spr (Yu)

191/291. The Structure of Modern Chinese
4 units, Spr (Sun)

193. Chinese Narratives of War and Honor
4 units, Spr (Schaberg)

CHINESE/GRADUATE

200. Directed Reading in Chinese
units by arrangement, Aut, Win, Spr (Staff)

201. Proseminar
5 units (Saussy, Staff) not given 2000-01

208. Teaching Asian Languages
2 units, (Sun)

211,212,213. Advanced Modern Chinese
5 units, Aut, Win, Spr (Zhu)

214. Introduction to Modern Chinese Literature I
5 units (Lyell) not given 2000-01

221,222,223. Advanced Classical Chinese

221. Philosophical Texts
5 units, Aut (Sahleen)

222. Historical Narration
5 units (J. Wang) not given 2000-01

223. Literary Essays
5 units, Win (Liu)

241,242,243. Modern Chinese Literature

241. The Short Story
5 units (Lyell) not given 2000-01

242. Essay
5 units (Staff) not given 2000-01

243. The Novel
5 units (Lyell) not given 2000-01

244. Workshop in Translation
5 units, Win (Lyell)

261. Sources of Chinese Poetry
4 units, Win (Schaberg)

263. Lyric (shih) I
4 units (Liu) not given 2000-01

264. Lyric (shih) II
4 units, Au (Liu)

266. Chinese Tz’u Poetry (Song Lyrics)
4 units (Liu) not given 2000-01

267. Methodologies in Approaching Modern and Contemporary Chinese Literature
5 units (Lyell) not given 2000-01

271,272. Traditional Chinese Fiction

271. Short Stories
4 units (J. Wang) not given 2000-01

272. Novels
4 units (J. Wang) not given 2000-01

273. Chinese Drama
4 units (J. Wang) not given 2000-01

286. Women Writers of Transnational China
4 units (Sang) not given 2000-01

291. The Structure of Modern Chinese
4 units, Spr (Sun)

334. Seminar in Modern Chinese Literature
5 units (Lyell) not given 2000-01

368. Dream of the Red Chamber: The Novel and Its Readers
4 units (Saussy) not given 2000-01
371. Seminar in Chinese Literary Criticism
5 units (J. Wang) not given 2000-01

373. Seminar on the Tso-Chuan
5 units (J. Wang) not given 2000-01

400. Advanced Language Training
1-15 units per quarter (Staff)

FIRST-YEAR JAPANESE

Students registering for the first time in a first- or second-year course must take a placement test if they have had any training in Japanese before entering Stanford. Sign up for section in department office before the quarter begins.

1,2,3. First-Year Modern Japanese
5 units, Aut, Win, Spr (Busbin)

5. Intensive First-Year Modern Japanese
12 units, Sum (Staff)

3 units, Aut, Win, Spr (Okano)

5 units, Aut, Win, Spr (Okano, Shimizu, Mori)

SECOND-YEAR JAPANESE

3 units, Aut, Win, Spr (Mori)

5 units, Aut, Win, Spr (Kubo, Shimizu)

21,22,23. Second-Year Modern Japanese
5 units, Aut, Win, Spr (Arao)

25. Intensive Second-Year Modern Japanese
12 units, Sum (Staff)

27,28,29. Intermediate Japanese Conversation
27. 2 units, Aut (Kuge)
28. 2 units, Win (Nakamura)
29. 2 units, Spr (Suzuki)

THIRD YEAR/ADVANCED JAPANESE

101,102,103. Third-Year Modern Japanese
5 units, Aut, Win, Spr (Arao)

105. Intensive Third-Year Modern Japanese
12 units, Sum (Staff)

3 units, Aut, Win, Spr (Fukuma)

114. Japanese for Business
3 units, Sum (Staff)

121,122,123. Advanced Japanese Conversation
2 units, Aut, Win, Spr (Kubo)

127A,128A,129A. Third-Year Japanese Language, Culture, and Communication A
3 units, not given 2000-01

5 units, Aut, Win, Spr (Shimizu)

177/277. The Structure of Japanese
4 units, Aut (Matsumoto)

JAPANESE/GRADUATE

200. Directed Reading in Japanese
units by arrangement, Aut, Win, Spr (Staff)

201. Proseminar
5 units (Staff) not given 2000-01

208. Teaching Asian Languages
2 units, Win (Matsumoto)

211,212,213. Advanced Modern Japanese
211. 3-5 units, Aut (Matsumoto)
212. 3-5 units, Win (Kubo)
213. 3-5 units, Spr (Kubo)

246. Introduction to Classical Japanese
5 units, Aut (Wallace)

247,248. Readings in Classical Japanese
247. 5 units, Win (Wallace)
248. 5 units, Spr (Reichert)

260. Japanese Poetry and Poetics
4 units (Hare) not given 2000-01

280. Medieval Japanese Texts
4 units, Spr (Hare)

281. Japanese Pragmatics
4 units (Matsumoto) not given 2000-01

296. Readings in Modern Japanese Literature
4 units, Aut (Reichert)

298. Translation Workshop
4 units (Staff) not given 2000-01

330. Seminar in Heian Fiction
5 units, Win (Wallace)

333. Seminar in Japanese Classical Drama
5 units (Hare) not given 2000-01

336. Seminar: Writing in Early Japan
5 units (Hare) not given 2000-01

396. Seminar in Modern Japanese Literature
5 units, not given 2000-01

400. Advanced Language Training
1-15 units per quarter (Staff)

KOREAN

1,2,3. First-Year Modern Korean
5 units, Aut, Win, Spr (Staff)

21,22,23. Second-Year Modern Korean
5 units, Aut, Win, Spr (Staff)

101,102,103. Third-Year Modern Korean
1-3 units, Aut, Win, Spr (Staff)
171/271. The Structure of Korean
4 units, not given 2000-01

200. Directed Reading in Korean
units by arrangement, Aut, Win, Spr (Staff)

208. Teaching Asian Languages
2 units, Win (Staff)

COMPARATIVE LITERATURE
273. The Postmodern Pacific
5 units (Palumbo-Liu) not given 2000-01

372. Literary Theory and the Necessary Fiction of Asia
4 units (Saussy) not given 2000-01

CULTURAL AND SOCIAL ANTHROPOLOGY
77. Japanese Society and Culture
5 units, Aut (Inoue)

83A. Korean American Diaspora
5 units, Aut (Lee)

87. Social Change in Contemporary China: Remaking the Middle Kingdom
5 units, Win (Kohrman)

223. Seminar on Japanese Anthropology
5 units (Inoue) not given 2000-01

ECONOMICS
121. Development Economics, with Special Reference to East Asia
5 units, Spr (Lau)

124. The Economy of Japan
5 units (Aoki) not given 2000-01

217. Money and Finance in Economic Development
5 units, Aut (McKinnon)

292/392. Undergraduate/Graduate Colloquium: Postwar Japan
5 units (Duus) not given 2000-01

EDUCATION
137Q. Stanford Introductory Seminar: Conceptualizing Human Motivation—East and West
3 units, Spr (Roeser)

HISTORY
135. Sources and Methods Seminar: Reading Chinese Women
5 units, Aut (Fei)

75. The United States and East Asia
5 units, Win (Chang, Duus)

90Q. Stanford Introductory Seminar: Buddhist Political and Social Theory
5 units, Spr (Mancall)

92A. The Historical Roots of Modern East Asia
5 units, Aut (Kahn)

92B. East Asia in the Age of Imperialism
5 units (Duus) not given 2000-01

968. Sources and Methods Seminar: Searching for Self—Biographies and Autobiographies in China
5 units (Neskar) not given 2000-01

192A. Chinese History to the 13th Century
5 units, Aut (Neskar)

192B. Chinese History from the Mongols to Early Modern Times
5 units (Kahn) not given 2000-01

192C. Modern China
5 units, Spr (R. Thompson)

194A. Japan from Earliest Times to 1560
5 units, Aut (Mass)

194B. Late Medieval and Early Modern Japan
5 units (Staff) not given 2000-01

194C. 19th-Century Japan
5 units (Staff) not given 2000-01

194D. The Rise of Modern Japan
5 units, Spr (Duus)

5 units (Duus) not given 2000-01

294/394. Colloquium: Law and Order in Premodern China
5 units, Spr (Neskar)

5 units, Win (Duus)

295D/395D. Colloquium: Modern Chinese Social History
5 units, Aut (R. Thompson)

295S. Undergraduate Research Seminar: Creating Modern China—From Empire to Nation in the Age of Imperialism
5 units (R. Thompson) not given 2000-01

296. Undergraduate Colloquium: Ordinary Lives—The Social History of Early Modern China
5 units (Kahn) not given 2000-01

298/398. Colloquium: Imperialism, Colonialism, and National Identity in Modern Japan
5 units (Duus) not given 2000-01

299. Colloquium: Japan in the Age of Courtiers and Warriors, 1180-1333
5 units, Win (Mass)

390A. Graduate Colloquium: Topics in Middle-Period Chinese History
4-5 units (Neskar) not given 2000-01

390B. Graduate Colloquium: Topics in Late Traditional Chinese History
4-5 units, Win (Kahn)

390C. Graduate Colloquium: Topics in Modern Chinese History
4-5 units, Win (R. Thompson)
391. Graduate Colloquium: Popular Religion in Premodern China
  5 units, Win (Neskar)

395A. Graduate Colloquium: Early and Medieval Japan
  4-5 units, Aut (Mass)

395B. Graduate Colloquium: Late Medieval and Early Modern Japan, 1560-1800
  4-5 units, Win (Staff)

395C. Graduate Colloquium: Modern Japan
  4-5 units, Spr (Duus)

490. Graduate Seminar: Modern China
  4-5 units, Spr (R. Thompson)

493. Graduate Seminar: Late Imperial China
  4-5 units (Neskar) not given 2000-01

498/498A. Graduate Seminar: Japanese Historical Texts
  8-10 units, Win, Spr (Mass)

MANAGEMENT SCIENCE AND ENGINEERING
298. Technology, Policy, and Management in Newly-Industrializing Countries
  2-4 units (Forbes) not given 2000-01

OVERSEAS STUDIES
KYOTO-SCTI
17R. Religion and Japanese Culture
  4-5 units, Spr (Kohn)

21. Research Project
  2-3 units, Spr (MacDougall)

176K. Energy and Climate Change: The Japanese Approach
  3 units, Spr (Masters)

215X. The Political Economy of Japan
  4-5 units, Spr (Kume)

POLITICAL SCIENCE
28/128. East Asia in the Age of Imperialism
  5 units (Oksenberg, Duus) not given 2000-01

29/129. Contemporary East Asia—(WIM)
  5 units, Spr (Toyoda)

115B/215B. Chinese Politics: The Transformation and the Era of Reform—(WIM)
  5 units, Win (Oi)

125/225. The Rise of Industrial Asia
  5 units, Aut (Oi, Okimoto, Oksenberg, Rohlen, Rowen)

139A. Japanese Foreign Policy
  5 units, Aut (Okimoto)

140M/240M. Chinese Foreign Policy
  5 units (Oksenberg) not given 2000-01

215D. Graduate Seminar: Approaches to Chinese Politics
  5 units, Win (Oi)

215E. Graduate Seminar: Political Economy of Reform in China
  5 units, Spr (Oi)

216M. Seminar: Environmental Politics in the Asia/Pacific Region
  5 units (Oksenberg) not given 2000-01

217M. Seminar: Evolution of the Chinese State
  5 units, Win (Oksenberg, Miller)

223. Seminar: Japanese Politics
  5 units (Okimoto) not given 2000-01

247L. Graduate Seminar: Human Rights Diplomacy
  5 units, Spr (Lewis)

315F. Graduate Seminar: Topics in Chinese Politics
  5 units (Oi) not given 2000-01

315O. Graduate Seminar: Methods for Social Science Research in China
  2 units, Win (Oi, Oksenberg, Walder)

RELIGIOUS STUDIES
3N. Stanford Introductory Seminar: In Search of a Religion
  3 units, Aut (Schopen)

11. Religious Classics of Asia
  4 units, not given 2000-01

14. Introduction to Buddhism
  4 units, Aut (Schopen)

18. Zen Buddhism
  4 units, Spr (Bielefeldt)

20. Chinese Religious Thought and Practice
  4 units, not given 2000-01

55. Introduction to Chinese Religions
  4 units (Faure) not given 2000-01

58. Religion and Society in Traditional China
  5 units, Aut (Boltz)

105. Popular Religions in Contemporary East Asia
  4-5 units, Win (Chau)

112. Women and Islam: Evolving Identities in a Changing World
  4 units, Aut (Armijo-Hussein)

113. Introduction to the Daoist Religion
  4 units, not given 2000-01

116. Japanese Buddhism
  5 units, Win (Faure)

117. Syncretism and Sectarianism in Chinese Buddhism
  5 units (Faure) not given 2000-01

118. Ritual in East Asian Buddhism
  4 units (Faure) not given 2000-01

120. Islam in China
  4 units, Spr (Armijo-Hussein)

124. Religion in Japan
  5 units, Win (Faure)

136. Buddhist Yoga
  4 units (Bielefeldt) not given 2000-01

150. Mahayana Buddhism
  5 units (Bielefeldt) not given 2000-01
206. Popular Chinese Religion
4 units, not given 2000-01

210. Speech and Writing in the Buddhist Traditions
4 units (Faure) not given 2000-01

212. Chuang Tzu
4 units, Win (Yearley)

213. The Taoist Canon
4 units, Win (Boltz)

214. Taoist Rites of Exorcism
4 units, Spr (Boltz)

221. Ch'an/Zen and Local Religion
5 units (Faure) not given 2000-01

230A. Zen Buddhism Seminar
5 units (Bielefeldt) not given 2000-01

256. Japanese Buddhism Seminar
4 units, Aut (Faure)

257. East Asian Buddhist Texts
4 units (Faure) not given 2000-01

258. Japanese Buddhist Texts
5 units, Spr (Bielefeldt)

286. Character and the Good Life
5 units (Yearley) not given 2000-01

306. Early Daoist Ritual
4 units, not given 2000-01

310. Buddhist Studies Proseminar
5 units (Bielefeldt) not given 2000-01

311A,B. Buddhist Studies Seminar
5 units, Win, Spr (Faure)

317. Zhuang Zhou as Husband: Gender-Shifting Views of Renunciation in Chinese Culture
5 units, Aut (Boltz)

319. East Asian Religions
(Bielefeldt, Faure, Yearley)

345. Comparative Religious Ethics
5 units (Yearley) not given 2000-01

350. Origins of the Mahayana
4 units, Spr (Schopen)

370. Graduate Seminar in Religious Ethics
4 units, Win (Yearley)

SOCIOLOGY

117A/217A. China under Mao
5 units, Aut (Walder)

217. China's Social Transformation
5 units (Walder) given 2001-02

217B. Seminar: Chinese Communist Revolution
5 units (Walder) given 2001-02

URBAN STUDIES

184. Managing the Urban Environment in East Asia
4 units, Win (Webster)

ECONOMICS

Chair: Gavin Wright
Teaching Coordinator: B. Douglas Bernheim
Associate Professors: Lawrence H. Goulder, Mark McClellan, Ilya Segal
Acting Assistant Professor: Rodney Chun

The department’s purposes are to acquaint students with the economic aspects of modern society, to familiarize them with techniques for the analysis of contemporary economic problems, and to develop in them an ability to exercise judgment in evaluating public policy. There is training for the general student as well as for those who plan careers as economists in civil service, private enterprise, teaching, or research.

The undergraduate program provides an excellent background for those going on to graduate work in the professional schools (for example, business and law) and may also be structured to prepare students for a Ph.D. program in economics. The department’s curriculum is an integral part of Stanford’s programs in International Relations, Public Policy, and Urban Studies.

The primary objective of the graduate program is to educate students as research economists. In the process, students also acquire the background and skills necessary for careers as university teachers and as practitioners of economics. The curriculum includes a comprehensive treatment of modern theory and empirical techniques. Currently, 25 to 30 students are admitted each year.

The faculty represent a wide spectrum of interests and conduct research on a broad range of topics. Most fields of economics are covered, including comparative institutional analysis, econometrics, economic development, economic history, industrial organization, international trade, labor, macro- and microeconomic theory, mathematical economics, and public finance.


UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The department established a new curriculum for the undergraduate program in September 1998 to strengthen students' quantitative skills and their knowledge of the analytical core of economics.

The total number of units required for the major has increased from 60 to 75. Economics 102B is now required for all majors. Students are encouraged to take Economics 102A and 102B before their senior year. The required number of field courses has increased from two to four. There is now greater flexibility in the choice of electives, including upper-division math and statistics.

Of the 75 units required for the major, at least 50 of which must be taken at Stanford, California. Students cannot declare Economics as their major until they have completed Economics 1 with a grade of 'C+' or better.

Students who declared Economics as their major prior to September 1, 1998 may opt to complete their Economics major under the old requirements (see the 1997-98 Stanford Bulletin) or under the new requirements listed below.

REQUIREMENTS FOR THE ECONOMICS MAJOR (75 units)

1. Economics 1 (5 units): principles of economics.
2. Economics 102A (5 units): it is recommended that students satisfy this basic statistics requirement before proceeding with the rest of the program. Prerequisite: Mathematics 41 or equivalent.
3. Economics 50 (5 units): basic price theory. Prerequisite: 1 and Economics 50M or Mathematics 51, or passed diagnostic test (administered at the beginning of Economics 50) on multi-variable calculus.
5. Economics 102B (5 units): econometrics. Prerequisites: Economics 50 and 102A.

Field Courses (must be taken at Stanford, CA) (20 units)—Four courses must be chosen from among Economics 111, 118, 121, 140, 141, 145, 149, 150, 154, 155, 156, 157, 160, 165 (5 units each).

Policy Writing Course (5 units)—This may be taken only after completing Economics 51 and 52, 102B, and at least two field courses.

Electives (20 units)—Choose from Economics courses numbered up to 198, excluding 90 (190) and 91 (191). Up to 10 units may be satisfied by basic math and statistics courses beyond that required in the basic economics courses. For example: Mathematics 41, 43, 51, 52, 53, 103, 104, 113, 114, 115; or Statistics 116 and 200.

OTHER REQUIREMENTS

No courses receiving Department of Economics credit under the preceding requirements may be taken credit/no credit.

A grade point average (GPA) of 'C' or better must be received for all units applied toward the preceding requirements.

To use transfer credit in partial satisfaction of the requirements, the student must obtain written consent from the department’s Associate Director of Undergraduate Study, who establishes the amount of credit to be granted toward the department requirements (see the Information Book for Economics Majors).

The time limit for satisfactory completion of a course is one year from the date an "incomplete" is given. Students are responsible for seeing that all grades of incomplete are cleared within the time limit.

SAMPLE PROGRAMS

Sample listings of upper-division economics electives may be examined in the department’s Information Book for Economics Majors, available in the Economics Building, room 136. Sample programs are provided for the following areas of emphasis: (1) liberal arts, (2) pre-business, (3) quantitative, (4) international, (5) political economy and regulation, and (6) preparation for graduate school in economics.

MINORS

Note—The curriculum for the minor in Economics was revised effective September 1, 1998 and the total number of units has increased from 30 to 35.

The minor in Economics has two main goals. The first is to acquaint students with the rudiments of micro- and macroeconomic theory that are required of all majors. The second is to allow students to build basic competence in the application of this theory to two fields of economics of their choosing, and the opportunity to specialize further in any one of these fields by taking one additional advanced course in the Department of Economics.

COURSE WORK

1. Economics 1 (5 units): principles of economics.
2. Economics 50 (5 units): basic price theory. Prerequisites: 1 and 50M or Mathematics 51, or passed diagnostic test (administered at the beginning of Economics 50) on multi-variable calculus.
4. Two field courses (10 units) may be chosen from the following list: Economics 102B, 111, 118, 121, 140, 141, 145, 149, 150, 154, 155, 156, 157, 160, 165.
5. One elective (5 units) from Economics courses numbered up to 198, excluding 90 (190) and 91 (191).

OTHER REQUIREMENTS

If the candidate’s major requires basic Economics courses (items 1 to 4 above), then half the units that count toward this minor must be made up by taking additional Economics courses towards the minor under items 5 and 6 above.

At least 20 out of the 35 units for the minor must be taken at Stanford in California.

No courses receiving Department of Economics credit under the preceding requirements may be taken credit/no credit. A grade point average (GPA) of 'C' or better must be received for all units applied toward the minor.

Two quarters before degree conferral, students must complete their declaration of the minor no later than the last day of the preceding quarter.

HONORS PROGRAM

The honors program offers an outstanding opportunity for independent research, creativity, and achievement. It is designed to encourage a more intensive study of economics than is required for the normal major, with course and research work of exceptional quality. Honors students participate in an Honors Research Symposium during Spring Quarter, with those nominated for prizes making oral presentations. The honors program requires:

1. Completing all requirements for the major, including Economics 103.
2. Achieving a grade point average (GPA) of at least 3.5 for the 75 units required of the Economics major. See details in the Information Book for Economics Majors.
3. Demonstrating completion of those lecture courses (at least two beyond Economics 102B and 103) most relevant for the proposed topic of the honors thesis. (These can be included in the basic 75 units.)
4. Candidates must write an honors thesis in their senior year for up to 10 units of credit (199D). The thesis must be of very high quality and written under the direction of a member of the department or its affiliated faculty. Units of 199D do not count toward the course work requirements for the basic economics major, or in the computation of the GPA requirement for honors. However, the requirement for Economics 101 may be replaced by 5 units of credit for the honors thesis to leave honors students with a total of at least 80 units overall.

Juniors interested in the honors program are urged to attend an informational meeting scheduled by the honors program director each Winter Quarter. At this meeting, students receive information on organizing an honors project and are given details on the Honor’s College. Prospective candidates for the honors program must submit an application to the director no later than the end of the second full week of the third quarter.
before graduation (typically Autumn Quarter of the senior year). Also required, later in the same quarter, is a three-page prospectus that must be approved by the thesis adviser.

**GRADUATE PROGRAMS**

Graduate programs in economics are designed to ensure that students receive a thorough grounding in the methodology of theoretical and empirical economics, while at the same time providing specialized training in a wide variety of subfields and a broad understanding of associated institutional structures. Toward these ends, the program is arranged so that the student has little choice in the curriculum at the outset but considerable latitude later on.

Students admitted to graduate standing in the department are expected to have a strong background in college-level economics, mathematics, and statistics. Preparation ordinarily consists of a college major in economics, a year-long calculus sequence that includes multivariate analysis, a course in linear algebra, and a rigorous course in probability and statistics.

**MASTER OF ARTS**

University requirements for the master's degree are described in the "Graduate Degrees" section of this bulletin.

The department does not admit students who plan to terminate their graduate study with the A.M. degree. Students may (but need not) elect this degree in preparation for the Ph.D. degree. A master's option is also available to Ph.D. candidates from other departments.

**Admission**—Prospective students must have completed the Stanford requirements for an A.B. in Economics or approximately equivalent training. Since students are required to take some of the same courses as Ph.D. candidates, similar preparation in mathematics and statistics generally is expected. Prospective applicants should submit their credentials together with a plan of study to the Director of Graduate Study for approval.

**Requirements**—A master's program must satisfy the following criteria:

1. Completing, at Stanford, at least 45 units of credit beyond those required for the bachelor's degree, of which at least 40 units must be in the Department of Economics. Economics courses must include 202, 210, and at least two other 200-level courses. Undergraduate courses must be numbered 105 or higher. No seminar courses numbered 300 or above can be counted.
2. Demonstrating competence in empirical methodology at the level of Economics 270. Normally, this is done by including that course in the program of study.
3. Submitting two term papers (or a thesis of sufficient quality). At least one of these papers must be deemed to represent graduate-level work. Normally, this means that it is written in connection with a 200-level course. A maximum of 10 units of credit can be earned for a thesis toward the 45-unit degree requirement.
4. A grade point average (GPA) of 'B' must be maintained for all master's level work. In addition, a grade of 'B-' or better must be earned in each of the two graduate theory courses. All courses must be taken for a letter grade.

**DOCTOR OF PHILOSOPHY**

University requirements for the Ph.D. are described in the "Graduate Degrees" section of this bulletin.

Admitted students must be adequately prepared in calculus, linear algebra, and statistics (see above). When deemed appropriate, a student may be required to complete the necessary background preparation at Stanford. All students take a common core curriculum at the outset and later branch out into the desired fields of specialization. Well-prepared students should anticipate spending, with some overlap, approximately two years in course work and another two years in seminars, independent study, and dissertation research. The goal is to complete the program in four years, although some types of research programs may require at least five years to complete. The department has a strong commitment to guiding students through the program expeditiously.

Questions and petitions concerning the program and the admissions process should be addressed to the Director of Graduate Study, who has responsibility for administering the graduate program.

Specific requirements are best discussed in two stages, the first consisting of requirements for admission to candidacy and the second involving further requirements for earning the degree.

**Admission to Candidacy for Ph.D.**—A student may apply for admission to candidacy when the following minimal requirements are met:

1. Successful results on comprehensive examinations in "core economics" (the examinations based on material from Economics 202, 203, 204, and 210, 211, 212), and "Econometrics" (the examination based on material from Economics 270, 271, 272).
2. Completing the requirements in two additional fields from the list below or one such field together with a substantial amount of work toward a minor in a related department approved by the Director of Graduate Study. Advanced fields include comparative institutional analysis, econometrics, economic development, economic history, industrial organization, international economics, labor economics, mathematical economics, monetary theory and advanced macroeconomics, and public finance.

Each field listed above can be satisfied by completing two courses, although students in some fields may be advised to add a third course, which can then be counted toward the distribution requirement discussed later. All courses (or comprehensive exams, when offered) must be passed with a grade of 'B' or better.

3. Completing a "candidacy paper," normally written in conjunction with one of the special fields selected above.

It is expected that the student will meet, and indeed exceed, the above standard by the beginning of the third year of residency. When this is not possible for any reason, the Director of Graduate Study should be consulted as early as possible during the second year. Once it is deemed that the above standards have been met, the student should complete the Application for Candidacy for Degree of Doctor of Philosophy. After approval, candidacy remains valid for five years (although it can be terminated earlier by the department if progress is deficient); it can be renewed or extended beyond this period only under unusual circumstances.

**Further Requirements for the Ph.D. Degree**—

1. **Additional Course Work**: four other graduate-level courses must be completed. One of these must be from the area of economic history unless that field has already been selected above and, in any event, these courses must be "distributed" in such a way that at least two fields not selected above are represented. In addition, if the special fields consist of econometrics together with mathematical economics, the distribution courses must include at least two from outside these areas. With the approval of the Director of Graduate Study, some of the distribution courses may be drawn from a minor subject, for those choosing that option.

2. **Teaching Experience**: each student must serve as a teaching assistant for at least one quarter. It is strongly recommended that this requirement be satisfied before the final year of residence.

3. **Seminar Participation**: each student is expected to participate in at least two all-year research seminars by the end of the fourth year of residence. Normally, participation in a seminar requires one or more oral presentations and the submission of a research paper (which, however, need not be completely separate from dissertation research).

4. **Ph.D. Dissertation**: the process involves selecting a topic, choosing an appropriate adviser, submitting a prospectus (signed by the adviser) outlining proposed research, selecting a three-member reading committee (usually all from the Department of Economics, although exceptions can be made under certain circumstances), passing the University oral examination at which these three faculty (and two other members of the Academic Council) ask questions about the completed research, and submitting a final draft of the work signed by all members of the reading committee. The student is advised to initiate this process as early as possible.
Ph.D. MINOR

To be recommended for the Ph.D. degree with Economics as a minor subject, a student must qualify in three fields of economics, at least one of which must be in the “core economics” sequence. Qualification in these fields is tested in the department’s comprehensive written examinations given annually. The standard of achievement in these examinations is the same for minor as for major candidates.

JOINT DEGREE PROGRAMS

The Department of Economics and the School of Law offer a joint program leading to the Ph.D. in Economics and the J.D. degree in Law. See the Stanford University bulletin Law School for descriptions of its participation in the joint program.

To qualify, the student’s program objectives must clearly justify such a joint program. Decisions are made by the Director of Graduate Study. A student’s program in economics must satisfy the same standards as a Ph.D. degree in Economics taken with a minor in Law. It is expected that dissertation research will cross department lines and that members of the dissertation committee will be drawn from both faculties.

Students normally spend the first year full time either in economics or in law and the second year full time in the other department. After the second year, courses in economics and law may be pursued simultaneously.

Other joint programs may be arranged; for example, the Ph.D. in Economics combined with one or two years of study in the School of Law, leading either to the nonprofessional Master of Legal Studies (M.L.S.) degree or to the nonprofessional Master of Jurisprudence (M.J.). See the bulletin Law School for the requirements. Conversely, a student taking the J.D. in the School of Law may apply for an A.M. in Economics.

FELLOWSHIPS AND ASSISTANTSHIPS

The department awards a number of fellowships for graduate study. Some first-year students are awarded full fellowships, including a stipend and tuition. All students whose record justifies continuation in the program may be assured support for the second through fourth years in the form of employment as a teaching or research assistant. These half-time appointments provide a stipend and tuition allowance. Entering students are not normally eligible for research or teaching assistantships.

Applications should be submitted before January 1 to the department admissions committee.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.


5 units, Aut (Taylor)
Win (Clerici-Arias)
Spr (Taylor, Clerici-Arias)

50. Economic Analysis I—Individual consumer and firm behavior under perfect competition. The role of markets and prices in a decentralized economy. Monopoly in partial equilibrium. Economic tools are developed from multi-variable calculus, using partial differentiation and techniques for constrained and unconstrained optimization. Prerequisites: 1, and 50M or Mathematics 51, or passed diagnostic test (administered at the beginning of Economics 50) on multi-variable calculus. GER:2c (DR:4)

5 units, Aut (Levin)
Win (Tendall)

50M. Mathematical Preparation for Economics—(Graduate students register for 150M.) Mathematics preparation for 50 and 102A, for students who either did not pass the diagnostic test for Economics 50 (see above) or who have not taken Mathematics 51. Elements of multi-variable calculus, constrained optimization, and matrix algebra. Prerequisite: 1 and Mathematics 41.

5 units, Aut (Russell)
Win (Asmundson)
Spr (Facchini)

51. Economic Analysis II—(Graduate students register for 151G.) Introduction to neoclassical analysis of general equilibrium, welfare economics, imperfect competition, externalities and public goods, inter-temporal choice and asset markets, risk and uncertainty, game theory, adverse selection and moral hazard. Multivariable calculus is used. Prerequisite: 50.

5 units, Aut (Meyer)
Win (Russell)
Spr (Kubler)

52. Economic Analysis III—(Graduate students register for 152G.) Growth and fluctuations in the economic system as a whole. National income accounts and aggregate relationships among stocks and flows in markets for goods, labor, and financial assets. Economic growth, inflation, and unemployment. The role of macroeconomic policies in the short and long run. Prerequisite: 50.

5 units, Win (D. Krueger)
Spr (Paal)

90. Introduction to Financial Accounting—(Graduate students register for 190.) Develops the students' ability to read, understand, and use corporate financial statements. Oriented towards the use of financial accounting information (rather than the preparer), and emphasizes the reconstruction of economic events from published accounting reports. GER:WIM (DR:5)

5 units, Spr (Staff)

99Q. Stanford Introductory Seminar: World of Finance—Preference to sophomores. Focus is on the operation of the world capital markets: stock markets in modern industrialized nations, markets in the NICs (newly industrialized countries), and in emerging market countries (former Third World nations). Financial institutions in the U.S. (stock markets, mutual funds) and how they relate to international markets. Inflation, interest rate trends, U.S. government agencies, and the impact of the Federal Reserve Bank on capital markets and flows. The macroeconomic factors that drive capital flows on a global level. GER:2c (DR:4)

3 units, Win (Marotta)

101. Economic Policy Analysis—Develops skills in economic policy analysis, writing, and oral presentation. Topics vary with instructor. Limited enrollment. Prerequisites: requirements 4 and 5 above. (WIM)

5 units, Aut (Topper, Bell, David)
Win (Bell, Gould, Smetters)
Spr (Cukierman, Tendall, Perry, Gould)

102A. Introduction to Statistical Methods—Introduction to statistical methods relevant to economics. Emphasis is on the description and examples of the use of statistical techniques. Probability: basic rules of probability, conditional probability, Bayes' rule, discrete and continuous probability distributions. Point estimation, tests of hypotheses, confi-
dence intervals, and linear regression model. Prerequisite: Mathematics 41 or equivalent. GER:2c (DR:4)

5 units, Aut (Slavov)
Win (Amemiya)


5 units, Win (Vylacil)
Win (Bresnahan)

102C. Advanced Topics in Econometrics—Identification and estimation of the effect of human capital variables on earnings (e.g., the return to education, tenure, etc.), and identification and estimation of labor supply models, focusing on microeconomic data. Topics: instrumental variable estimation, limited dependent variable models (probit, logit, and tobit models), and panel data techniques (fixed effect and random effect models, dynamic panel data models).

5 units, Spr (Pistaferri)

103. Applied Economic Analysis—The construction and use of econometric models for analyzing economic phenomena. Students complete individual projects and core material. Topics vary with the instructor. Limited enrollment. Prerequisites: 52, 102B.

5 units, Aut (Pistaferri)
Win (Rothwell)
Spr (Chun)

106. The World Food Economy—The interrelationships among food, population, resources, and economic development. The role of agricultural and rural development in achieving economic and social progress in low-income nations. Emphasis is on the public sector decision making as it relates to food policy.

5 units, Win (Falcon, Naylor)

111. Money and Banking—The structure of financial markets. The monetary system in the U.S. and other countries. The microeconomics of banking, and the macroeconomic role of banks. Theories of money demand, monetary policy, and monetary models of the macro-economy. Prerequisites: 50, 52.

5 units, Win (Kumhof)
Spr (Cukierman)

113. Technology and Economic Change—The economic causes and consequences of technological change. The historical experience of advanced industrial countries and the more recent experience of less developed economies. Topics: the origins of modern industry in the U.S. and Europe, technology and the growth of large-scale organizations, late-comers to industrialization (Japan and newly industrializing countries), economic growth and slowdown in mature industrial countries, and present concerns and future prospects (the influence of technology on employment, civilian "spillover" from military R&D, and coping with rapid technological change). GER:3b (DR:9)

5 units, not given 2000-01

115. European Economic History—Economic changes and growth in Western Europe from the medieval period to the present. The transformation of Europe from an economically and culturally backward part of the world to the center of the world economy pre-WW I. Topics: attitudes toward technology and science, demography, institutional changes, politics and military technology, and production technology. GER:3b (DR:9)

5 units, Aut (Greef)

116. American Economic History—The history of the U.S. economy from colonial times to the present. The application of economic analysis to historical issues, and the role of historical context in economics. Topics: American economic growth in international perspective; the economics of slavery and regional divergence; the origins and consequence of the "American system" of technology and business organization; recent U.S. economic performance in historical perspective. Prerequisite: 1. GER:3b,4b (DR:3 or 9)

5 units, Win (Wright)

118. The Economics of Development—The economic problems and policy concerns of developing economies. Theories of economic growth and development, inequality and poverty, agriculture and rural development, fertility, education, the economic role of family. Focus is on economic models rather than case studies. Prerequisite: 51. GER:4a (DR:2)

5 units, Aut (Chun)

120. Socialist Economies in Transition—Privatization, restructuring, and institutional change in Eastern Europe and the former Soviet Union. Analysis of property rights, corporate governance, incentives, and resource allocation in socialist and transitional economies. Emphasis is on liberalization and privatization policies (including mass and voucher programs) as the primary instruments to induce changes in behavior.

5 units, Aut (Earle)

124. Development Economics, with Special Reference to East Asia—The macroeconomic aspects of economic development: structural transformation, resource utilization, mobilization, and allocation; the sources of economic growth; intersectoral transfers; the role of the external sector; money and finance in development; stabilization in closed and open economies; strategies for economic development; the role of intangible capital; and endogenous technical progress. Illustrations from the economic development experience of E. Asia, including Japan, China, Hong Kong, S. Korea, Singapore, Taiwan, Indonesia, Malaysia, Philippines, Thailand, etc. Prerequisite: 52. GER:4a (DR:2)

5 units, Spr (Lau)

137. Information and Incentives—Focus is on the provision of incentives in situations where one part has more information than another. A part may have better information about things that it controls (moral hazard), or about things that are outside of its control (adverse selection). In the former, well-structured contracts give the party incentives to exercise control in a mutually beneficial way. In the latter, contracts should give the party incentives to reveal its private information truthfully. The general structure of incentive problems and the design of contracts and institutions to deal with such problems. Applications (time permitting): executive and employee compensation in firms, sharecropping, financial contracts and credit rationing, insurance, markets with unobservability of quality, monopolistic price discrimination, regulation of natural monopolies, income taxation and redistribution, the provision of public goods, and auctions. Prerequisite: 51.

5 units, Spr (Segal)

138. Risk and Insurance—Insurance affects a large part of the American economy: life insurance and pension funds provide financial capital for the private sector; health insurance funds the 14 percent of GNP spent on medical services. Economic analysis, theoretical and empirical, provides an understanding of how the insurance markets function, how and why they are regulated, and how they might be improved. The organization of the various parts of the insurance industry and the public policy issues concerning earthquake, health, auto, and environmental risk insurance. Insurance-like devices consumers use to affect risk, such
as product guarantees, or preventive and precautionary activities. Prerequisite: 50.
5 units, Win (Smetters)

139D. Directed Reading and Research
1-10 units (Staff)

140. Financial Economics—Introduction to modern portfolio theory and corporate finance. Topics: properties of various financial instruments, including financial futures, mutual funds, the "Capital Asset Pricing Model," and models for pricing options and other contingent claims. Prerequisites: 50, at least one course in regression analysis.
5 units, Aut (Shoven)
Spr (Kubler)

141. Public Finance and Fiscal Policy—What role should and does government play in the economy? What are the effects of government expenditure, borrowing, and taxation? Policy topics: budget surpluses/deficits; tax reform; social security, public goods, and externalities; fiscal federalism; public investment; and cost-benefit analysis. Prerequisites: 51, 52.
5 units, Aut (Smetters)
Spr (Boskin)

142. The Political Economy of the Federal Budget—(Enroll in Public Policy 196.)
5 units, Win (Cogan)

5 units, Spr (Hammond)

5 units, Win (Fencavel)

5 units, not given 2000-01

148. Urban Economics—The economics of urban areas. Costs and benefits of cities, city location, land rent and land use, suburbanization, zoning, poverty, housing and segregation, homelessness, local government finance, transportation, schools, and crime. Prerequisites: 50, 102A.
5 units, not given 2000-01

5 units, not given 2000-01

150. Economic Analysis I—(Same as Public Policy 104.) The relationship between microeconomic analysis and public policy making. How economic policy analysis is done and why political leaders regard it as useful but not definitive in making policy decisions. Economic rationales for policy interventions, methods of policy evaluation and the role of benefit-cost analysis, economic models of politics and their application to policy making, and the relationship of income distribution to policy choice. Readings: the theoretical foundations of policy making and policy analysis, and applications to the adoption and implementation of programs in several areas. Prerequisite: 51.
5 units, Win (Noll)

150M. Mathematical Preparation for Economics—See 50M.

151. Economic Analysis II—See 151.

152. Economic Analysis III—See 152.

153. Economics of the Internet—Applications of microeconomic theory to Internet businesses: auctions, online transactions, entry barriers, valuation, pricing of facilities, policy for broadband communications, network economics, standards, economics of information. Prerequisites: 51 and at least one of 102B, 103, 104, 113, 135, 137, 140, 149, 157, or 160.
5 units, Aut (Hall, Rosston)

154. Economics of Legal Rules and Institutions—Description and analysis of the existence, design, and consequences of legal rules. Topics: common ideas that run through diverse areas of law, including individual rationality, economic efficiency, conventional and Coasian analyses of externalities, enforcement, costs, and market consequences of legal restrictions on contract terms. Private vs. public enforcement of law, the tradeoff between certainty and severity of punishment, the choice between ex post and ex ante sanctions, and the choice between property and liability rules. Applications: property, intellectual property, contract, criminal, tort, family, and environmental law. Prerequisite: 51.
5 units, Aut (Polinsky)

5 units, Spr (Goulder)

156. Economics of Health and Medical Care—(Graduate students register for 256; same as Health Research and Policy 256, Biomedical Informatics 256.) Graduate students with research interests should take 248. Institutional, theoretical, and empirical analysis of the problems of health and medical care. Topics: institutions in the health sector; measurement and valuation of health; nonmedical determinants of health; medical technology and technology assessment; demand for medical care and medical insurance; physicians, hospitals, and managed care; international comparisons. Prerequisite: 50 and 102A or equivalent statistics, or consent of instructor. Recommended: 51.
5 units, Win (McClellan)

157. Imperfect Competition—Extends and develops the basic tools of price theory in the context of U.S. industrial market structure. The application of theoretical models and concepts to the behavior of firms and markets when the conditions of perfect competition are not satisfied. Topics: monopoly, oligopoly, monopolistic competition, concentration measures, international competition, advertising, innovation, externalities, economies of scale, and the role of information in markets. Prerequisite: 51.
5 units, Aut (Bajari)
158. Antitrust and Regulation—The history, economics, and legal background of the institutions under which U.S. industry is subject to government control. Topics: antitrust law and economics; the economics and practice of public utility regulation in the communications, transportation, and energy sectors; and the effects of licensing. Emphasis is on the application of economic concepts in evaluating the performance and policies of government agencies.

5 units, Spr (Noll, Bresnahan)

160. Game Theory and Economic Applications—Mathematically rigorous introduction to game theory and its applications to economics. Topics: strategic and extensive form games, Nash equilibrium, subgame-perfect equilibrium, Bayesian equilibrium, and Perfect Bayesian Equilibrium. The theory is applied to repeated games, auctions, and bargaining. Examples from economics and political science. Prerequisites: 51 and one rigorous course in calculus, or consent of instructor.

5 units, Win (Tadelis)

182. Monetary Economics—Dynamic analysis of the role of money and monetary policy in the macro economy, using calculus. Topics: the exchange process and the role of money; inside and outside money; inflation and the inflation tax; international monetary systems; the indeterminacy of floating exchange rates; policies to fix the exchange rate and inflationary incentives; currency crises and speculative attacks; money and interest-bearing government debt; the government’s budget constraint and the coordination of monetary and fiscal policies; hyperinflations and stabilizations; the effect of the national debt on consumption, savings, investment and output; time consistency of government policies. Prerequisites: 51, 52, 111.

5 units, Aut (Paul)

165. International Economics—Comparative advantage in production and trade among nations; trade policy; increasing returns, imperfect competition and trade; the international monetary mechanism; domestic monetary, fiscal, and exchange rate policies and their relationship to foreign trade; global financial crises and trade. Prerequisites: 1, 51, 52.

5 units, Win (Kumhof)

169. International Financial Markets and Monetary Institutions—(Graduate students register for 269.) How nations interact to ensure that international trade is monetized and multilateral rather than bartered and bilateral. Hedging exchange and interest rate risks: selection of currencies of invoice and trade credit; parity relationships among futures, swaps, and options contracts. The exchange rate and the trade balance. Regulating excess volatility in exchange rates and capital flows. Alternative international monetary standards from gold to the dollar to the European Monetary System. Prerequisite: 165. Recommended: knowledge of money and banking.

5 units, Spr (McKinnon)

170. Intermediate Econometrics I—(Same as 270.)

5 units, Aut (Amemiya)

171. Intermediate Econometrics II—(Same as 271.)

5 units, Win (Goldberger)

172. Intermediate Econometrics III—(Same as 272.)

5 units, Spr (MaCurdy)

181. Optimization and Economic Analysis—The development of optimization techniques, including calculus, linear and nonlinear programming, the calculus of variations, and control theory. Emphasis is on concepts and results rather than techniques and proofs. Examples: static and dynamic theories of the household and the firm, and problems in aggregate planning and control. Prerequisites: 51 and 102A, Mathematics 51 or equivalent.

5 units, Win (Hammond)

190. Introduction to Financial Accounting—See 90.

191. Introduction to Cost Accounting—See 91.

198. Junior Honors Seminar

5 units, Spr (Rothwell)

199D. Directed Reading and Research—Honors. In-depth study of an appropriate question and completion of a thesis of very high quality. Normally written under the direction of a member of the Department of Economics (or a member of some closely related department). See description of honors program. Register for at least 1 unit for at least one quarter. Meets first week of Autumn Quarter (see Stanford Daily for details).

1-10 units, Aut, Win, Spr (Rothwell)

PRIMARILY FOR GRADUATE STUDENTS

350. A.M. Thesis

by arrangement

400. Ph.D. Dissertation

by arrangement

A. CORE ECONOMICS

202. Core Economics I—Theory of the consumer and the implications of constrained maximization; uses of indirect utility and expenditure functions; theory of the producer, profit maximization, and cost minimization; behavior under uncertainty; partial equilibrium analysis and introduction to models of general equilibrium. Prerequisite: thorough understanding of the elements of multivariate calculus and linear algebra. Limited enrollment. Prerequisite for advanced undergraduates: consent of instructors.

5 units, Aut (Rangel, Kubler)


5 units, Win (Bernheim)

204. Core Economics V—The theory of resource allocation over time, competitive equilibrium and intertemporal efficiency, capital asset pricing models, equilibrium with securities, pricing of securities and arbitrage. Overlapping generations models with incomplete market structure and sunspots. Limited enrollment. Prerequisite: 203.

5 units, Spr (Kurz)


5 units, Aut (D. Krueger)

211. Core Economics IV—Monetary theory: evidence on the nature of economic fluctuations, the role of money (overlapping generations, cash in advance, money in the utility function), the dynamic impact of changes in money on the economy, the natural rate of unemployment and job creation/destruction, exchange rate determination, international transmission of money, dynamic stochastic general equilibrium models. Macroeconomic policy: theoretical rationale or central bank independence, time inconsistency, the impact of public debt, rules vs. discretion, interest rate vs. money rules, international monetary policy coordination.
rational expectations econometric policy evaluation. Limited enrollment.

5 units, Win (Hall)
Spr (Tadelis)

212. Core Economics VI—The theory of contracts, emphasizing contractual incompleteness and the problem of moral hazard. Incentive regulation. Competition with imperfect information, including signaling and adverse selection. Investment theory and empirics, including adjustment costs and the q theory; consumption theory and empirics, focusing on the life-cycle model; and the labor market. Limited enrollment.

5 units, Spr (Taylor)

301A,B,C. Workshop in Microeconomics
10 units (Staff)

310A,B,C. Workshop in Macroeconomics
10 units (Staff)

B. ECONOMIC DEVELOPMENT

To receive comprehensive credit in the field, students must complete any two from 214, 216, and 217 and submit an additional paper. Students wishing to do research in the field are strongly advised to take all three courses in development, as well as courses in international economics, such as 266, and comparative institutional analysis.

214. Microeconomic Issues in Economic Development—Micro-economic problems of developing economies, emphasizing the rural agrarian. Topics: determination of income, models of savings, role of the household, and issues relating to health, nutrition, and education. Emphasis is on empirical tests of theoretical models and empirical evidence on these issues.

5 units, Win (A. Krueger)

216. The Macroeconomics of Economic Development and Growth—The historical experience of economic development; patterns of economic growth; sources of economic growth; models of economic development (two-gap models, dual economy models, open economy models, “new” growth models), savings and capital accumulation; the role of money and finance; inflation; taxation; stabilization in closed and open economies with incomplete and/or imperfect markets; human and other forms of intangible capital; capital infrastructural capital and externalities; income distribution; numerical general equilibrium models.

5 units, Spr (Law)


5 units, Aut (McKinnon)

267. Special Topics in International Economics—See section ‘H’ below.

5 units, Spr (A. Krueger)

315A,B,C. Workshop in Economic Development
10 units (Staff)

C. ECONOMIC HISTORY

The requirements for the field are: (1) a comprehensive exam in Spring Quarter based on material from at least two of the courses listed below, and (2) one research paper on a subject approved by one of the faculty teaching any of the following five courses.

224. Science and Technology in Economic Growth—Upper-division undergraduates may attend with consent of instructor. The roles played by the growth of scientific knowledge and technical progress in the development of industrial societies. Emphasis is on the interactions between science and technology, and the organizational factors which have influenced their effectiveness in contributing to productivity growth.

5 units, not given 2000-01

225. Technology, Economy, and Society—Determinants and consequences of technological innovations in the economic history of the West from the 9th to the 19th centuries. Selected “clusters” of technical innovations in production and warfare are examined for the determinants of the rate and bias of innovative activity, economic and cultural conditions governing diffusion, and the problems of identifying and measuring primary and second-order economic consequences.

5 units, not given 2000-01

226. Problems in American Economic History—The American economy from colonial times to the present. The role of economic history as a distinctive intellectual approach to the study of economics. Topics: American growth record and its determinants, the origins and character of U.S. technology, slavery, the Great Depression, recent U.S. performance in historical perspective.

5 units, Aut (David)

227. European Economic History—Economic growth and development in Western Europe from the 11th to the 20th centuries, emphasizing the formative period up to the 19th century. Emphasis is on the experiences of Britain, France, Germany, and Italy. The interrelations between the growth and distribution of output, demographic trends, technological and organizational changes in trade and industry, and the changing formal and informal institutions governing political and economic activity.

5 units, not given 2000-01

228. Institutions in Economic History: Form, Function, and Evolution—See 294.

5 units, Win (Greif)

325A,B,C. Workshop in Economic History
10 units (Staff)

D. MONETARY THEORY AND ADVANCED MACROECONOMICS

Requirements for the field are successful completion of 233 and 234.


5 units, Aut (Stiglitz)

234. Advanced Macroeconomics II—Topics in the theory of fluctuations and growth.

5 units, Spr (Paal)


5 units, Win (D. Krueger, Pistaferri)

E. PUBLIC FINANCE

To receive credit for the field, students must complete 241 and 242 by passing the final examinations, and submit an acceptable research paper on a topic approved by the instructor for either course.


241. 5 units, Win (Boskin, Rangel)

242. 5 units, Spr (Rangel, Shoven)
243. Economics of the Environment—Upper-division undergraduates may attend with consent of instructor. Analysis of the sources of environmental problems in market economies and of policy options for addressing these problems. Topics: choice of policy instruments (taxes, standards, tradable permits), environmental risk assessment, valuation of non-marketed commodities (environmental amenities, biodiversity), environmental policy making under uncertainty, the optimal mix of corrective and distortionary tax instruments, and the dynamics of economic growth in the presence of non-reproducible natural resources.

5 units, Aut (Goulder)

244. Economics of Financial Markets—Focus is on the theoretical and empirical analysis of market microstructure, fundamentals of asset pricing, and asset allocation under uncertainty. Prerequisite: 101 and 102, or consent of instructor.

10 units (Staff)


5 units, Win (Pencavel, MaCurdy)

246. Labor Economics II—The economics and econometrics of program evaluation. The impact of public policies on labor demand, labor supply, human capital and wage determination. Social, natural, and quasi-experiments.

5 units, Spr (Pistaferri)

247. Health, Medical Care, and Aging—Introduction to current research and policy issues in the economics of health, medical care, and aging. Topics: technological change; demand for medical care; behavior of physicians, hospitals, and health plans; analysis of insurance markets; effects of health and health insurance on labor supply; health risks and individual behavior; economic demography; political economy of the health care sector. Emphasis is on the development and estimation of microeconomic models.

5 units, not given 2000-01

248. Economics of Factor Markets—See 156.

10 units (Staff)


5 units, Aut (Kumhof)

266. International Trade Theory—The determinants of trade and comparative advantage. Trade with imperfectly competitive markets.
5 units, Win (Razin)

5 units, Spr (A. Krueger)

5 units, Spr (McKinnon)

365A,B,C. Workshop in International Economics
10 units (Staff)

1. ECONOMETRICS

All Ph.D. students are required to take 270, 271, and 272. To receive credit in the econometrics field, students must complete 273, and either 274 or 275.

5 units, Spr (McKinnon)

5 units, Aut (Amemiya)

5 units, Win (Wolak)

5 units, Win (MacCurdy)

5 units, Aut (Wolak)

274. Limited Dependent Variables—Discrete choice models; Tobit models; Markov chain and duration models. Prerequisite: 273 or consent of instructor.
5 units, Win (Vivasail)

5 units, Spr (Sargent)

276. Special Topics in Econometrics—Possible subjects: robust estimation, stochastic control, prediction theory, Bayesian analysis, factor analysis, pooling of time series and cross section data. Prerequisite: 273.
5 units

370A,B,C. Workshop in Econometrics
10 units (Staff)

J. MATHEMATICAL ECONOMICS

To receive credit in the mathematical economics field, students must complete two courses from 280, 281, 282, 284, 286, or 287.

5 units, Win (Hammond)

5 units, not given 2000-01

5 units, not given 2000-01

284. Topics in Dynamic Economics—The principle of optimality, discounted dynamic programming under certainty and uncertainty, and applications in economics. Bayesian models of learning and expectation formation. Theory of Rational Beliefs and Endogenous Uncertainty. Develops the extensive mathematical tools used in applications.
5 units, Win (Kurz)

286. Game Theory and Economic Application—Non-cooperative games, games in extensive and normal forms, games with incomplete information, Nash equilibrium, rationalizability, and refinements. Applications and current selected research.
5 units, Spr (Levin)

5 units, Aut (Kubler)

288. Computational Economics—Computational approaches to solving economic problems. Overview of numerical analysis. Economic problems in computationally tractable forms, and the use of numerical analysis techniques to solve them. Examples of problems solved numerically (general equilibrium models, optimal taxation, dynamic programming, economic growth, life-cycle models, intervention in commodity markets, Bayesian econometrics, equilibria of dynamic and repeated games, and nonlinear rational expectations equilibria with asymmetric information). Prerequisite: equivalent of first-year graduate core economics sequence.
5 units, Aut (Judd)

290. Multiperson Decision Theory—Review of working papers, emphasizing methods of game theory and topics in mathematical economics that use game-theoretic models. The effects of differences in information, limitations on observability and contracts, etc., on strategic behavior. Prerequisites: two courses from the Choice Theory/Mathematics Economics sequences, or consent of instructor.
5 units, not given 2000-01

385A,B,C. Workshop in Mathematical Economics
10 units (Staff)

386. Interdisciplinary Seminar on Conflict Resolution—(Same as Law 611, Management Science and Engineering 459, Psychology 283.) Addresses problems of conflict resolution and negotiation from an interdisciplinary perspective. Presentations by faculty and by scholars from other universities.
1-2 units, Win (Alexander, Arrow, Ross, Wilson)
K. COMPARATIVE INSTITUTIONAL ANALYSIS

To receive credit for this field, students are required to take 291 and then select at least one of: 292, 293, or 294. Students expecting to make Comparative Institutional Analysis their primary field are also required to take the workshop (391).

291. Contracts and Organizations—General issues and recent developments in the theory of contracts. Topics: mechanism design, hidden information and hidden action models; contracting with many agents; problems with dynamic agency, renegotiation and commitment; incomplete contracts, and applications of contract theory to theories of the firm and organizational design. Prerequisites: 202 and 203, or consent of instructor.

292. Comparative Analysis of Institutions and Organizations—Game theoretic (classic and evolutionary analysis of institutions as multiple equilibria. Norms, social embeddedness, organizations as conventions, contract enforcement and corporate governance mechanisms, and states. Institutional complements and diachronic institutional linkage.

293. Advanced Topics in Contracts and Organizations—Recent developments and promising research directions in contracts and organizations. Topics: reputational concerns, implicit contracts in long-term relationships, contractual solutions to the hold-up problem, property rights and the theory of the firm, multilateral contracting. Prerequisite: 291 or consent of instructor.

294. Institutions and Organizations in Historical Perspective—(Same as 228.) Description and analysis of institutions and organizations in the Western historical experience, emphasizing the formative period from the 11th to the 18th centuries. Discussion of the formation, function, and evolution of institutions highlights alternative conceptual frameworks (neoclassical, transaction cost economics, institutionalism, and Marxism and neo-Marxism), while utilizing game theory, mechanism design, contract theory, etc. Topics: institutions related to trade organization, the organization of production, feudalism, mercantilism, and the state.

OXFORD

168X. Path Dependence of Science and Technology since the Industrial Revolution
5 units, Spr (David)

PUEBLA

118X. Developmental Macroeconomics: The Mexican Case—(Same as Overseas Studies 114X.)
5 units, Win (Cárdenas)

SANTIAGO

160X. Latin America in the International Economy
5 units, Win (DiFilippo)

165X. Latin American Economies in Transition—(Same as Overseas Studies 130X.)
5 units, Aut (Mañoz)

ENGLISH

Chair: Robert M. Polhemus
Director of Creative Writing Program: Tobias Wolff
Director of Program in Writing and Critical Thinking: Andrea A. Lunsford
Professors: John B. Bender (English, Comparative Literature), Eavan Boland (on leave Autumn), George H. Brown, Terry Castle (on leave), W. S. Di Piero (on leave Autumn), J. Martin Evans, John Felstiner, Kenneth W. Fields, Jay W. Fliegelman, Rolando Greene (English, Comparative Literature), David Halliburton, Shirley Heath (English, Linguistics), Seth Lerner (English, Comparative Literature, on leave), John L’Hureux, Herbert Lindenberger (Comparative Literature, English; on leave Autumn), Andrea A. Lunsford, Diane W. Middlebrook (on leave Autumn, Winter), Franco Moretti, Stephen Orgel (on leave), Patricia A. Parker (English, Comparative Literature), Robert M. Polhemus, Arnold Rampersad, David R. Riggs, Ramón Saldívar (English, Comparative Literature), Elizabeth Tallent, Elizabeth C. Traugott (Linguistics, English), Tobias Wolff
Associate Professor: Sandra Drake (on leave Autumn)
Assistant Professors: Brett Bourbon, Denise Gigante, Maureen Harkin (on leave), Nicholas Jenkins (on leave), Gavin Jones, Donna Jones, Robert Kaufman (on leave Autumn), Paula Moya (on leave), Stanne Ngai, William Solomon, Jennifer Summit, Alex Wolfech
Professor (Teaching): Larry Friedlander (on leave)
Senior Lecturers: Helen B. Brooks, Claude Reichard
Lecturers: Christine Alfano, Donald Bacon, Rick Barot, Jason Brown, Nancy Cohen, Chris Gabbard, Ryan Harty, David MacDonald, MaLinda McCollum, Daniel Orozco, Linda Paulson, Cheryl Ross, Edward Steidle, Elizabeth Wahl, Ann Watters, Marvina White
Visiting Professors: Maxine Hong Kingston, Carol Sibbott
Visiting Assistant Professor: William Kuskin

The Department of English offers work in English and American literature, other literature written in English, English philology, creative writing, and expository writing. It maintains the William Dinsmore Briggs Memorial Library for the use of graduate students and the Jones Room for the use of the Stegner Fellows in Creative Writing.
UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The English major is designed to provide students with both an understanding of the historical development of English literature and an appreciation of the variety and richness of literary texts. It offers a rigorous training in interpretive thinking and precise expression.

PREPARATION FOR THE MAJOR

Before declaring an English major, students should have satisfied the University writing requirement. The following departmental requirements are in addition to the University’s basic requirements for the bachelor’s degree. With the exception of English 150 when taken to satisfy the Writing in the Major requirement, any two of the requisite courses may be taken on a satisfactory/no credit basis at the discretion of the instructor, but students intending to go on to graduate school should weigh the fact that a grade of satisfactory provides little evidence of their abilities.

MAJOR PROGRAMS OF STUDY

Because the Department of English recognizes that the needs and interests of literature students vary, it has approved several major programs of study in English. Each of these has different objectives and requirements; students should consider carefully which major corresponds most closely to their personal and professional objectives.

MAJOR IN ENGLISH

This program provides for the interests of students who wish to understand the full variety and historical development of English and American literature over the centuries. It is recommended to prospective candidates for admission to graduate schools of English. Of particular value to students selecting this major are courses with broad historical perspectives on literature and language and courses which concentrate on major writers. Students who declared an English major prior to Autumn Quarter 1999 must choose one 5-unit course from each of the eight areas B-H and P. Students declaring an English major during Autumn Quarter 1999 or thereafter must choose one 5-unit course from each of the nine areas A-H and P. The areas are: A, Language and Rhetoric; B, Medieval; C, Renaissance; D, Shakespeare; E, Restoration and 18th Century; F, Romantic and Victorian; G, American before 1900; H, Modern (originally written in English after 1899); P, Poetry and Poetics. A student who took a 3-unit sub-100 English course while still a non-major may count it retroactively for the major. Only one such course may be applied to the major. If possible, students should take courses in chronological sequence.

At least one of the courses satisfying the major must be English 180-189 (Seminars for English Majors) or 196 (Honors Seminar), or an English seminar offered in the Stanford in Oxford program at St. Catherine’s College. Other English courses which are taught in a seminar format and require a substantial amount of critical writing may be approved by the Director of Undergraduate Studies on a case by case basis. Students are urged not to postpone satisfying this requirement until late in their major career. Undue tardiness may result in a delay of degree conferral.

In addition, students who declared an English major prior to Autumn Quarter 1999 must elect three additional courses from among those offered by the Department of English (excluding only English 1-2-3 and advanced composition courses). Students declaring an English major during Autumn Quarter 1999 or thereafter must elect two such courses. In place of one of these elective courses, students may choose one upper-division course in a foreign language read in the original language.

Students may apply as many as four English courses taken at other approved universities towards their major.

Foreign Language Requirement—Students declaring an English major are not required to demonstrate proficiency in a foreign language at a higher level than that mandated by the University. However, students who plan to study English literature at the graduate level should be aware that advanced reading skills in one or more foreign languages enhance their chances of admission to and success in most Ph.D. programs.

Students who declared English prior to Autumn Quarter 1996 should see the undergraduate English coordinator.

EMPHASIS IN THE ENGLISH MAJOR

English with a Creative Writing Emphasis—This program is designed for students who want a sound basic knowledge of the English literary tradition as a whole and at the same time want to develop skills in writing poetry or fiction. Students must take a total of twelve (those declaring an English major prior to Autumn Quarter 1999) or thirteen (those declaring an English major during Autumn Quarter 1999 or thereafter) courses offered through the Department of English and the Program in Creative Writing. As do all English majors, they must choose one course from each of the eight areas B-H and P (those declaring an English major prior to Autumn Quarter 1999) or the nine areas A-H and P (those declaring an English major during Autumn Quarter 1999 or thereafter), and fulfill the seminar requirement.

In addition, they must take four courses specifically designed for either the fiction or the poetry concentration. Fiction writers must first take English 90 (Fiction Writing), then two quarters of 190 (Intermediate Fiction Writing) or 290A (Advanced Fiction Writing), and 137 (Development of the Short Story). Poetry writers must first take English 92, then two quarters of 192 (Intermediate Poetry Writing) or 292 (Advanced Poetry Writing), and one course in poetry in addition to the course that fulfills area requirement P (for students declaring an English major during Autumn Quarter 1999 or thereafter, English 150 is the only course which satisfies Area P), to be approved by a poetry instructor in the Creative Writing program. Courses taken to satisfy an area requirement cannot also satisfy a Creative Writing requirement. English 198 or tutorials taken elsewhere (such as tutorials in the Overseas Studies Program) may not be substituted for required courses. Students should note that they cannot anticipate completing the Creative Writing emphasis until they have been accepted in either 190 or 192.

Admission to English 190, 192, 290, 290A, and 292 is by consent of the instructor and is based on the quality of the student’s work. Admission to a single quarter of 190 or 192 does not guarantee admission to a second quarter of 190 or 192. Students should submit a manuscript to the Creative Writing office by the last day of the preceding quarter, and in the case of Autumn Quarter, no later than one week before the beginning of the quarter. Students not admitted to the intermediate courses may take the introductory course a second time.

English with Interdisciplinary Emphasis—This major is intended for students who wish to combine the study of literature of one broadly defined historical period with an interdisciplinary program of courses relevant to that literature. Students are required to fulfill the language and seminar requirements listed under the major in English and to take a total of fifteen (students who declared an English major prior to Autumn Quarter 1999) or sixteen (those declaring an English major during Autumn Quarter 1999 or thereafter) courses distributed as follows:

1. One course in area P, Poetry and Poetics.
2. Five courses in one of the two areas of emphasis:
   a) Medieval and Renaissance Literature: students who declared an English major prior to Autumn Quarter 1999 must take one course in each of the areas A, B, C, and D and both English 111 and 112*. Students declaring an English major during Autumn Quarter 1999 or thereafter must take one course in three of the areas A, B, C, and D and both English 111 and 112*.
   b) English and American Literature from the Enlightenment to the Present: students must take one course in each of the areas E, F, G, and H and English 110.
3. Three elective English courses in the area of emphasis.
4. Six courses related to the literature of the chosen period from such disciplines as anthropology, the arts (including the practice of one of the arts), classics, comparative literature, European or other literature, feminist studies, history, modern thought and literature, political science, and African-American studies. These courses should form a coherent program and they must be relevant to the historical focus of the courses chosen by the student to meet the requirement. Each of

355
those courses must be approved in advance by the interdisciplinary program director.
5. In addition, students in the interdisciplinary program must write at least one interdisciplinary paper. This may be a senior honors essay (197), a senior independent essay (199), an individual research paper (194 or 198), or a paper integrating the material in two courses the student is taking in two different disciplines.

* Two more focused courses may be substituted for each of the courses 110, 111, and 112, by consent of the student’s adviser in the interdisciplinary major.

MINORS
Both the Department of English and the Creative Writing program offer a distinct minor.

**English**—The minor in English offers some flexibility for those students who want to pursue specific interests within English and American literature, while still requiring certain courses that ensure coverage of a variety of periods, genres, and methods of studying literature.

1. Either English 150, Poetry and Poetics, or a course in literary theory (the 166 series).
2. One course in American literature written before 1900.
3. Three courses in either of the following configurations:
   a) English 110, Chaucer, Shakespeare, Milton, and their Contemporaries
   A course in English literature written between 1700 and 1900*
   A course in English literature written after 1900*
   b) English 111, From the Enlightenment to the Modern Period
   A course in English literature written before 1500*
   A course in English literature written between 1500 and 1700*
4. Two elective courses in literature originally written in English. One of these may be a course in Creative Writing.

* English literature here means literature of the British Isles.

**Creative Writing**—The minor in Creative Writing offers a structured environment in which students interested in writing fiction or poetry develop their skills while receiving an introduction to literary forms. Students choose a concentration in either fiction or poetry. All courses must be taken for a letter grade.

1. Four writing workshops, three in the chosen concentration, one outside.
   a) Fiction minors must first take English 90 (Fiction Writing), then one or two quarters of 190 (Intermediate Fiction Writing) or 290 (Advanced Fiction Writing). The fourth writing course must be English 92 (Poetry Writing).
   b) Poetry minors must first take English 92 (Poetry Writing), then one or two quarters of 192 (Intermediate Poetry Writing) or 292 (Advanced Poetry Writing). The fourth writing course must be English 90 (Fiction Writing).
2. Two English literature courses:
   a) Fiction minors must take English 137 (The Development of the Short Story).
   b) Poetry minors must take English 150 (Poetry and Poetics).
   c) One elective course, selected with the approval of the Creative Writing program adviser.

**Interdepartmental Majors**

**English and French Literatures**—This major provides a focus in English literature with additional work in French literature. Candidates for the A.B. in English and French Literatures who declared an English major prior to Autumn Quarter 1999 complete eight courses in English, one from each of the areas A-H and P listed under the major in English, and fulfill the seminar requirement. Those declaring an English major during Autumn Quarter 1999 or thereafter complete nine courses in English, one from each of the areas A-H and P listed under the major in English, and fulfill the seminar requirement. In addition, they must complete a coherent program of four courses in French literature, read in the original. The program of each student must be approved by the Director of Undergraduate Studies in English and by the Department of French and Italian.

**English and German Literatures**—Candidates for the A.B. in this major who declared an English major prior to Autumn Quarter 1999 must complete a program exactly analogous to the preceding major, with eight courses in English, and a coherent program of four courses in German literature, read in the original, with approval by the departments involved as specified above. Those declaring an English major in Autumn Quarter 1999 or thereafter take nine courses in English.

**English and Italian Literatures**—Candidates for the A.B. in this major who declared an English major prior to Autumn Quarter 1999 must complete eight courses in English and a coherent program of four courses in Italian literature, read in the original, with approval by the departments involved as specified above. Those declaring an English major in Autumn Quarter 1999 or thereafter take nine courses in English.

**English and Spanish or Spanish-American Literatures**—Candidates for the A.B. in this major who declared an English major prior to Autumn Quarter 1999 must complete eight courses in English, and a coherent program of four courses in Spanish or Spanish-American literatures, read in the original, with approval by the departments involved as specified above. Those declaring an English major in Autumn Quarter 1999 or thereafter take nine courses in English.

**Advanced Work**

**Individual Research**

Students taking 100- or 200-level courses may, with the consent of the instructor, write a follow-up 5-unit paper based on the course material and due no later than the end of the succeeding quarter (register for 194). The research paper is written under the direct supervision of the professor; it must be submitted first in a preliminary draft and subsequently in a final version.

**Integrated Work**

Students taking (either simultaneously or consecutively) two or three courses which have a clear thematic or historical relationship to each other may, with the consent of the relevant instructors, write one large-scale paper of 7,000-10,000 words integrating the material in the courses in question.

**Senior Independent Study**

Independent study is open, on approval by the department, to seniors majoring in English who wish to work throughout the year on a critical or scholarly essay of about 10,000 words. In rare circumstances, advisors may nominate exceptional students for honors if the student’s thesis is outstanding and the program of study has been approximately equivalent to that required of regular honors students.

**Honors Program**

Students who wish to undertake a more extensive program in English literature, including a tutorial, a seminar, and independent research, are invited to apply for the honors program as soon as possible after declaring an English major and no later than Autumn Quarter of the junior year. Application consists of completing a form and submitting a sample of critical writing. Admission is selective. Provisional admission is announced in December. Permission to continue in the program is contingent upon successful completion of a tutorial and submission, by May 15 of the junior year, of a Senior Honors Essay proposal with a bibliography.

In the junior year, students may choose between the following two options: (1) at Oxford, take two quarters of the seminar sequence offered by St. Catherine’s College, or at least 5 units of tutorial work arranged by the director of the Oxford program; (2) at Stanford, take 5 units of tutorial work in the Department of English. Students who elect the latter option select a regular English lecture course, registering for 3 rather than 5 units. With that course, they also take a 5-unit tutorial (196T) on the same or related material with an advanced graduate student.

The courses taken at Oxford or at Stanford to satisfy this requirement for the honors program can also be used where appropriate to satisfy the area requirements for the English major.
In the Spring Quarter of the junior year, students take a 5-unit honors seminar on critical approaches to literature. (Students who have previously taken an upper-division course in literary theory and criticism may be exempted from this seminar on request and with the approval of the director of the honors program.)

In the senior year, honors students complete the senior honors essay for 10 units under supervision of a faculty adviser. In Winter Quarter, all honors students take a 3-unit essay workshop focused on the process of researching and writing the essay. The deadline for submitting the honors essay is May 15.

Students in the honors program complete the following:
Area Requirements (A-H, P), nine courses
One tutorial, 5 units
Junior seminar and workshop, 8 units total
Senior Honors Essay, 10 units
Three electives

Note—For other opportunities for extended essay projects, see Senior Independent Essay and English 194 and 199.

HONORS PROGRAM IN HUMANITIES

An honors program in Humanities is available for English majors who wish to supplement the major with a related and carefully guided program of studies. See the “Interdisciplinary Studies in Humanities” section of this bulletin for a description of the program. Students wishing to take the Comparative Literature option within the honors program in Humanities should see the “Comparative Literature” section of this bulletin.

VISITING STUDENTS

Students who do not wish to become candidates for a graduate degree, but who are qualified to meet the standards of admission to a master’s or Ph.D. program, may apply to Graduate Admissions, Registrar’s Office, Stanford University for admission as nonmatriculated students for a period of not more than three consecutive quarters. Each quarter they may take up to three English courses numbered 101 to 299, or two such courses and (with the consent of the instructor) one English course numbered above 300.

GRADUATE PROGRAMS

For University regulations governing advanced degrees, see the “Graduate Degrees” section of this bulletin.

Eligibility—Students with a bachelor’s degree of acceptable quality may apply to pursue graduate work toward an advanced degree in English at Stanford. (Formal application for candidacy is a separate step taken somewhat later.) Students whose previous preparation is in a field other than English are expected to make up deficiencies. Credits for previous graduate work at Stanford or elsewhere more than five years old may be reevaluated or rejected.

Graduate students are admitted as candidates for only the Ph.D. or the A.M. in English and American Literature. The A.M. is a one-year program without financial aid. A.M. students may apply to the Ph.D. program.

MASTER OF ARTS IN TEACHING

The A.M. in Teaching is offered jointly by this department and the School of Education. The degree is intended for candidates who have a teaching credential or relevant teaching experience and wish to further strengthen their academic preparation. The program consists of a minimum of 25 units in the teaching field and 12 units in the School of Education. Detailed requirements for the program are outlined in the “School of Education” section of this bulletin.

Candidates for the A.M. in Teaching may also qualify for the State of California Community College Instructor Credential by completing additional units of academic work at the graduate level. For further information, consult the Credentials Analyst, room 134, School of Education, early in the Autumn Quarter.

DOCTOR OF PHILOSOPHY

University regulations regarding the Ph.D. are discussed in the “Graduate Degrees” section of this bulletin. The following department requirements, dealing with such matters as residence, dissertation, and examinations, are in addition to the University’s basic requirements for the doctorate. (Students should consult the most recent edition of “Informal Notes: Procedures for the Ph.D.” Copies are available in the English Graduate Studies office.)

A candidate for the Ph.D. degree must complete three years (nine quarters) of full-time work, or the equivalent, in graduate study beyond the bachelor’s degree. Candidates are expected to offer at least 97 units of graduate work in addition to the doctoral dissertation. At least three consecutive quarters of graduate work, and the final course work in the doctoral program, must be taken at Stanford.

A student may count no more than 20 units of English 398 toward the 97 course units currently required for the Ph.D., without the written consent of the Director of Graduate Studies. A student takes at least 70 graded units (normally fourteen courses) of the 97 normally required total units (397, 398, and 399 do not count toward the 70 graded units). No more than 15 units (normally three courses) may come from 100-level courses of the following: English 296; two courses in literature before 1800; two courses in literature after 1800; four elective courses representing a mixture of survey and specialized courses chosen to guarantee familiarity with a reasonable proportion of the works on the reading list for doctoral candidates. Students whose undergraduate transcripts do not show courses in the following areas must take courses in these areas as part of their A.M. program: Medieval, Renaissance, 18th century, 19th century, 20th century (the latter two in either British or American literature). Normally, no more than two courses taken outside the department may count toward the degree, but the Graduate Studies Committee considers exceptions.

Candidates who can demonstrate unusually strong preparation in the history of English literature may undertake a 40- to 60-page master’s thesis. Such candidates may register for up to 15 units of English 399 with the faculty member who supervises the thesis work. Candidates who write a master’s thesis may petition to be excused from up to 15 units of the requirements described above. The additional 30 units normally consist of the five required courses and one additional course. These courses are chosen by the student and approved by the adviser and the Director of Graduate Studies.

2. Demonstration of a reading knowledge of one foreign language. (For ways of fulfilling this requirement, see the section below on language requirements for the Ph.D.)

Candidates for a coterminal master’s degree must fulfill all requirements for the A.M. in English (including the language requirement), as well as general and major requirements for the A.B. in English. A minimum GPA of 3.5 in the major is required of those applying for the coterminal master’s degree. No courses used to satisfy the A.B. requirements (either as General Education Requirements or department requirements) may be applied toward the A.M. However, additional undergraduate units not applied to any previous degree may be applied toward the A.M. See the description of programs under the "Undergraduate Degrees" section of this bulletin.
es. When graduate students are teaching 50-percent time, one course may be taken for 4 units.

This program is designed to be completed in five years. Six sections of supervised teaching (four as a teaching assistant in a literature course and two as the instructor of a Writing and Critical Thinking course) are a requirement of the Ph.D. program.

In the first quarter of their first year, students take a 2-unit laboratory in pedagogy. In the first quarter of their second year, students take a Pedagogy Seminar and an Apprentice Teaching Program. The seminar and apprentice teaching constitute a 50-percent teaching appointment. Apprentice teachers attend the classes, conferences, and tutorials of the master teachers, then take responsibility for conducting a class, holding conferences, and grading papers. All these teaching activities are done under the supervision of the master teachers, who insure the quality of instruction.

ENGLISH LITERATURE

Requirements are as follows:

1. A course in either Old English or Middle English literature read in the original vernacular.
2. A course that focuses on language, linguistics, history of the language, or rhetoric. English courses that satisfy this requirement include: 101, 102, 102A, 102B, 104C, 105, 119, 211, 212, 260A, 293, 295, 300E, 312A, 363B.
3. A minimum of six courses for a letter grade from the graduate colloquia and graduate seminars, of which at least three must be graduate seminars. The colloquia and seminars should be from different genres and periods as approved by the adviser.
4. A 5-unit course, Introduction to Graduate Study, and a 2-unit laboratory in pedagogy.
5. Completion, in Autumn Quarter of the second year, of a Pedagogy Seminar, which includes the Apprentice Teaching Program described above, and a Pedagogy Seminar in Winter Quarter. There are no units associated with this work.
6. Students are encouraged to take an advanced course in literary theory or criticism.
7. Consent of the adviser if courses taken outside the Department of English are to count toward the requirement of 97 units.
8. Qualification: see item 9 under requirements of the Ph.D. program in English literature.
9. A University oral examination to be taken no later than the Spring Quarter of the student’s third year of graduate work. This examination covers the field of concentration as defined by the student and the student’s adviser.

ENGLISH AND AMERICAN LITERATURE

Requirements are as follows:

1. A course in either Old English or Middle English literature read in the original vernacular.
2. A course that focuses on language, linguistics, history of the language, or rhetoric. English courses that satisfy this requirement include: 101, 102, 102A, 102B, 104C, 105, 119, 211, 212, 260A, 293, 295, 300E, 312A, 363B.
3. A minimum of 35 units of graduate courses in American literature and 35 units in English. Among these, a minimum of six courses for a letter grade from the graduate colloquia and graduate seminars, of which three must be in American literature, and of which at least three must be graduate seminars. The colloquia and seminars should be in different genres and periods as approved by the adviser.
4. A 5-unit course, Introduction to Graduate Study, and a 2-unit laboratory in pedagogy.
5. Completion, in Autumn Quarter of the second year, of a Pedagogy Seminar which includes the Apprentice Teaching Program described above, and a Pedagogy Seminar in Winter Quarter. There are no units associated with this work.
6. Students are encouraged to take an advanced course in literary theory or criticism.
7. Consent of the adviser if courses taken outside the Department of English are to count toward the requirement of 97 units.
8. Qualification: see item 9 under requirements of the Ph.D. program in English literature.
9. A University oral examination to be taken no later than the Spring Quarter of the student’s third year of graduate work. This examination covers the field of concentration as defined by the student and the student’s adviser.

ENGLISH AND COMPARATIVE LITERATURE

The Ph.D. program in English and Comparative Literature is designed for students wishing an extensive knowledge of the literature, thought, and history of England and of at least one foreign country, for one period. Approximately half of the student’s course work and reading is devoted to this period, with the remainder of the time given to other periods of English and American literature since 1350.

This degree, administered by the Department of English, is to be distinguished from the Ph.D. in Comparative Literature. The latter program is intended for students unusually well prepared in foreign languages and involves advanced work in three literatures, one of which may be English. Interested students should consult a Department of English adviser, but faculty from Comparative Literature may also provide useful supplementary information.

The requirements are as follows:

1. Qualifications: see item 9 under requirements of the Ph.D. program in English literature. For qualifications in the doctoral program in English and Comparative Literature, candidates are not held responsible for literature before 1350, but will instead include on their reading list a selection of works from a foreign language read in the original language.
2. A knowledge of the basic structure of the English language and of Chaucer. This requirement may be met by examination, or by taking 10 units of courses chosen from among those offered in linguistics, English philology, and early and middle English literature including Chaucer. No particular courses are required of all students.
3. A 5-unit course, Introduction to Graduate Study, and a 2-unit laboratory in pedagogy.
4. Completion, in Autumn Quarter of the second year, of a Pedagogy Seminar, which includes the Apprentice Teaching Program described above, and a Pedagogy Seminar in Winter Quarter. There are no units associated with this work.
5. A knowledge of one foreign language sufficient to take graduate-level literature courses in a foreign-language department and an advanced reading knowledge of a second language.
6. A minimum of 45 units in the history, thought, and literature of one period, in two or more languages, one of which must be English and
one foreign. Students normally include at least two courses in a foreign literature read in the original language and two courses listed under Comparative Literature or Modern Thought and Literature. As many as 20 units of this requirement may be satisfied through courses in reading and research. A student may receive graduate credit for no more than three 100-level courses in the Department of English.

7. A minimum of six courses for a letter grade from graduate colloquia and graduate seminars, of which three must be graduate seminars and of which at least four must be in the Department of English. Among these courses, students should take one in literary theory or criticism. These colloquia and seminars should be in different genres and periods as approved by the adviser.

8. A University oral examination covering the field of concentration (as defined by the student and the student's adviser). This examination, based on a reading list established by the candidate in consultation with his or her adviser, is normally taken no later than the Spring Quarter of the third year of graduate study. However, those who spend the third year studying abroad may take this examination after their return early in the fourth year.

LANGUAGE REQUIREMENTS

All candidates for the Ph.D. degree (except those in English and Comparative Literature, for whom special language requirements prevail) must demonstrate a reading knowledge of two foreign languages. Candidates in the earlier periods must offer Latin and one of the following languages: French, German, Greek, Italian, or Spanish. In some instances, they may be required to offer a third language. Candidates in the later period (that is, after the Renaissance) must offer either French, German, or Latin as one language and may choose the second language from the following: Greek, Latin, French, German, Italian, Spanish, Russian, or another language relevant to the student's field of study. In all cases, the choice of languages offered must have the approval of the candidate's adviser. Any substitution of another language must be approved by the Director of Graduate Studies.

The Graduate Studies Committee does not accept courses taken as an undergraduate in satisfaction of the language requirement for doctoral candidates. For students coming to doctoral work at Stanford from graduate work done elsewhere, satisfaction of a foreign language requirement is determined by the Director of Graduate Studies based on the contact hours, syllabus, reading list, etc. Transfer is not automatic.

The candidate must satisfy one language requirement by the end of the first year (that is, before registration in the following year), and the other by the end of the third year.

Foreign language requirements for the Ph.D. may be fulfilled in any of the following ways:

1. A reading examination given each quarter by the various language departments, except for Latin and Greek.

2. For Latin and Greek, an examination by the Department of English. The Latin examination is given before registration in the Autumn Quarter in order to permit those who need the course to register for Latin 3. It is also given in the eighth week of the Winter and Spring quarters, along with other department examinations for languages not tested by the Educational Testing Service.

3. Passage with a grade of 'B' or higher of a course in literature numbered 100 or higher in a foreign language department at Stanford. As an alternative for Latin, French, and Spanish, passage of Latin 51 and 52, French 50, Italian 50, and Spanish 50, respectively, with a grade of 'B' or higher.

CANDIDACY

Students are expected to file for candidacy after successful completion of qualifying procedures and, in any event, by the end of the second year of doctoral study. Candidacy is valid for five years, and may be extended, subject to satisfactory progress.

DISSERTATION

As early as possible during their graduate study, Ph.D. candidates are expected to find a topic requiring extensive original research and to seek out a member of the department as his or her adviser. The adviser works with the student to select a committee to supervise the dissertation. Candidates should take this crucial step as early in their graduate careers as possible. The committee may advise extra preparation within or outside the department, and time should be allowed for such work.

Immediately after the dissertation topic has been approved by the adviser, the candidate should file a formal reading committee form as prescribed by the University.

The dissertation must be submitted to the adviser as a rough draft, but in substantially final form, at least four weeks before the University deadline in the quarter during which the candidate expects to receive the Ph.D. degree. Dissertations may not be submitted during the Summer Quarter.

JOINT Ph.D. IN ENGLISH AND HUMANITIES

The Department of English participates in the Graduate Program in Humanities leading to the joint Ph.D. degree in English and Humanities. For a description of that program, see the "Interdisciplinary Studies in Humanities" section of this bulletin.

Ph.D. IN MODERN THOUGHT AND LITERATURE

Stanford also offers a Ph.D. degree in Modern Thought and Literature. Under this program, students devote approximately half of their time to a modern literature from the Enlightenment to the present, and the other half in interdisciplinary studies. Interested students should see the "Modern Thought and Literature" section of this bulletin and consult the chair of the program.

CREATIVE WRITING FELLOWSHIPS

The Creative Writing Program each year offers five two-year fellowships in poetry and five two-year fellowships in fiction. These are not degree-granting fellowships. Information is available in the Creative Writing office (650) 723-2637.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

NUMBERING SYSTEM

Writing and Critical Thinking Courses: 1-3
Introduction to Literature: 5
Introduction to the Humanities: 7, 8, 9
English Language Courses: 101-109, 200-209
English Period Courses: 10-19, 110-119, 210-219, 310-319
American Period Courses: 20-29, 120-129, 220-229, 320-329
Genre Courses:
Drama: 40-45, 140-145, 240-249, 340-349
Poetry: 50-59, 150-159, 250-259, 350-359
Topic Courses: 60-69, 160-169, 260-269, 360-369
Author Courses: 70-79, 170-179, 270-289, 370-389
Seminar for English Majors: 180-189
Graduate Colloquia: 300-309
Writing Courses, Workshops, Individual Study, etc.: 90-99, 190-199, 290-299, 390-399

INTRODUCTORY (FOR NON-MAJORS)

Classes for students whose major is undeclared, or who are not majoring in English.

1,2. Writing and Critical Thinking—The successful completion in proper sequence of 1 and 2 satisfies the first-year writing requirement (W). Classes meet twice a week for 50 minutes along with individual conferences with instructors. Both involve reading texts and improving writing techniques. First quarter: students concentrate on finding an appropriate thesis and developing and organizing ideas. Second quarter: students concentrate on the finer points of style and on preparing and writing researched essays. Students choose from one of three general categories (A, B, or C). Readings vary in each, but the primary concern...
is student writing and its improvement. All are expository and argumentative writing courses, not conventional courses in cultural studies, literature, film, etc. (W)

1A,2A. Writing and the Arts of Persuasion—Writing generally based on readings of effective arguments.
3 units, Aut-Win, Win-Spr (Staff)

1B,2B. Writing about Social and Political Issues—Writing generally based on readings drawn from social science disciplines.
3 units, Aut-Win, Win-Spr (Staff)

1C,2C. Writing about Literature—Writing generally based on literature and other creative forms.
3 units, Aut-Win, Win-Spr (Staff)

3. Writing and Critical Thinking—Fulfills the first-year writing requirement (W) in one quarter, offered only to students scoring 4 or 5 on the English AP exams or 6 or 7 on the International Baccalaureate at the higher level. Classes meet twice a week for 75 minutes along with individual conferences with the instructor. Students concentrate on the same writing techniques as those presented in the 1 and 2 sequence, choosing from one of three general thematic categories (A, B, or C). Readings vary in each, but the primary concern is student writing and its improvement. All are expository and argumentative writing courses, not conventional courses in cultural studies, literature, film, etc. (W)

3A. Writing and the Arts of Persuasion—Writing generally based on readings of effective arguments.
4 units, Aut, Win, Win-Spr (Staff)

3B. Writing about Social and Political Issues—Writing generally based on readings drawn from social science disciplines.
4 units, Aut, Win, Win-Spr (Staff)

3C. Writing about Literature—Writing generally based on literature and other creative forms.
4 units, Aut, Win, Win-Spr (Staff)

4. Directed Writing—For students, especially freshmen and sophomores, who have completed the Writing Requirement and wish further work in writing. Workshops and individual tutorials are tailored to each student’s needs. Graduate credit available.
3 units, Aut, Spr (Staff)

5. Introduction to Literature—Enriches the understanding and appreciation of literature by introducing the essential tools and concepts used in textual analysis. Readings include masterpieces from a wide variety of literary genres, historical periods, and national literatures.
not given 2000-01

8,9. The Literature of Transformation—(Enroll in Introduction to the Humanities 21A,B.)
8. 5 units, Win (Evans, Middlebrook)
9. 5 units, Spr (Evans, Middlebrook)

10,11,12. Masterpieces of English and American Literature—In-depth study of selected works by major English and American writers from the medieval to modern periods.

10. Masterpieces of English Literature I: Chaucer, Shakespeare, Milton, and their Contemporaries—(English majors and others taking 5 units, register for 110.) Introduces medieval and Renaissance literature through the works of Chaucer, Shakespeare, Milton, and selected contemporaries.
3 units, Win (Summit)

11. Masterpieces of English Literature II: From the Enlightenment to the Modern Period—(English majors and others taking 5 units, register for 111.) Introduction to literary masterpieces written in English between 1700 and 1950. Treats fiction and poetry, with some drama. GER:3a (DR:7)
3 units, Spr (B. Gelpi)

12. Masterpieces of American Literature—(English majors and others taking 5 units, register for 112.) Survey of some major works of American literature, 1840-1940. Authors: Hawthorne, Melville, Whitman, Dickinson, James, Fitzgerald, Wright, Faulkner. GER:3a (DR:7)
3 units, Win (G. Jones)

30. The Novel—(English majors and others taking 5 units, register for 130.) Introduction to the novel through a close, sympathetic reading of a variety of major novels, focusing on their construction, narrative technique, and expression of human values. GER:3a (DR:7)
3 units, Spr (Woloch)

40. Drama—(English majors and others taking 5 units, register for 140.) Principal dramatic forms, development of dramaturgy, and modern masterpieces of the theater from Ibsen to the present. GER:3a (DR:7)
3 units, Win (L’Heureux)

60. The English Bible—(English majors and others taking 5 units, register for 160.) Selected readings in important versions of the English Bible as the source, inspiration, and reference for English and American literary works.
not given 2000-01

60K. Gender and American Cinema, 1930-1950: The Woman’s Film and Film Noir—(English majors and others taking 5 units, register for 160K.) Examines two popular and continually revisited Hollywood genres, the woman’s film or domestic melodrama of the ‘30s and ‘40s, and crime melodramas of the ‘40s and ‘50s, as sites for exploring constructions of femininity and masculinity in mass-mediated American modernity. Issues of narrative representation and genre provide the introduction to ways of critically “reading” and writing about film and culture. Weekly screenings and essays by film theorists, scholars, and historians (Doane, Williams, Modeleski, Cavell, Telotte, Bordwell, etc.), provide basic cinematic concepts, a history of the medium and its formal developments, ongoing debates in the fields of film and gender studies, and strategies of close viewing. GER:3a,4c (DR:7f)
3 units, Aut (Ngai)

65A. Introduction to Medieval Culture—(English majors and others taking 5 units, register for 165A.) Introduction to the development of medieval culture through the study of religious, philosophical, literary, artistic, social, and political sources, emphasizing the interrelationships among them. GER:3a (DR:7 or 8)
3 units, Win (Brown, Miller)

65B. Arthurian Literature—(English majors and others taking 5 units, register for 165B.) Survey of medieval classics (in translation) that recount the legends of Arthur and his companions. Focus is on the relation between history and fiction, the social uses of literature, and on the construction of gender roles. GER:3a,4c (DR:7f)
3 units, Aut (Brown)

67A. Americans in Paris—(English majors and others taking 5 units, register for 167A.)
3 units, Spr (Mesa)

68. American Indian Mythology, Legend, and Lore—(English majors and others taking 5 units, register for 168.) GER:3a (DR:7)
3 units, Win (Fields)

68A. Introduction to Native American Studies—(English majors and others taking 5 units, register for 168A.) For students with no background in the area. Introduction to the multidisciplinary field of Native American Studies as it has emerged in American universities over the past 30 years. Focus is on the study of literary texts by Native American writers, federal policy, western education, and contemporary efforts to bolster tribal traditions in marking out the future for Native American people and communities. GER:4b (DR:3)
not given 2000-01
68B. Introduction to Afro-American Literature—(English majors and others taking 5 units, register for 168B.) The slave narrative and other representative genres (poetry, short stories, essays, novels): works by Douglass, Jacobs, Chesnutt, Du Bois, Dunbar, Toomer, Hurston, Wright, Ellison, Baldwin, and Morrison. GER:3a (DR:7)
3 units, Win (Rampersad)

68C. Introduction to Chicana/o Literature—(English majors and others taking 5 units, register for 168C.) Introduction to the literature of the nation’s second largest ethnic minority. Works by Paredes, Gonzales, Alurista, Cervantes, Rivera, Cisneros, Viramontes, Moraga, Anzaldua, Buciaga, Acosta, and Rodriguez are examined to see how these uncertain Americans negotiate their struggles with U.S. immigration policies, racial discrimination, economic exploitation, and cultural transformation through literature. not given 2000-01

68E. Introduction to 20th-Century Irish Literature—(English majors and others taking 5 units, register for 168E.) GER:3a (DR:7)
3 units, Win (Boland)

79E. Hemingway and Fitzgerald—(English majors and others taking 5 units, register for 179E.)
3 units, Aut (Bacon)

INTRODUCTORY SEMINARS

63N. Stanford Introductory Seminar: New Yorker Writers—Preference to freshmen. GER:3a (DR:7)
3 units, Aut (Tallent)

64N. Stanford Introductory Seminar: From Cannibals to Vampires; or How to Consume the Other—Preference to freshmen. GER:3a (DR:7)
3 units, Win (Gigante)

3 units, Spr (Solomon)

69N. Stanford Introductory Seminar: The Two Cultures—Bridging the Gap—(Same as Computer Science 99G.) Preference to freshmen. GER:3a (DR:7)
3 units, Aut (Roberts, Saldívar)

72N. Stanford Introductory Seminar: Jewish-American Literature—Preference to freshmen. GER:3a (DR:7)
3 units, Win (Felstiner)

74N. Stanford Introductory Seminar: Introduction to Caribbean Literature—Preference to freshmen. GER:3a (DR:7)
3 units, Aut (D. Jones)

81Q. Stanford Introductory Seminar: Women and Authority in the Middle Ages—Preference to sophomores. GER:3a,4c (DR:7)†
3 units, Aut (Brown)

82Q. Stanford Introductory Seminar: Shakespeare’s Plays—Preference to sophomores. GER:3a (DR:7)
5 units, Aut (Rebholz)

FOR MAJORS

BASIC UNDERGRADUATE SURVEYS

Note—Graduate students may receive graduate credit for no more than three 100-level courses.

5 units, Win (Summit)

111. Masterpieces of English Literature II: From the Enlightenment to the Modern Period—See 11.
5 units, Spr (B. Gelpi)

5 units, Win (G. Jones)

130. The Novel—See 30.
5 units, Spr (Woloch)

140. Drama—See 40.
5 units, Win (L’Heureux)

160. The English Bible—See 60.
not given 2000-01

AREA A: LANGUAGE AND RHETORIC

102. History of the English Language—(Same as Linguistics 62.) The evolution of English in Britain and the U.S. from Anglo-Saxon times to the present; colonial and post-colonial English; the use of English worldwide. Emphasis is on issues in standardization, contact, the development of English pidgins and Creoles, and of African American Vernacular English. GER:3a (DR:7)
3-5 units, Spr (Traugott)

102B. The Structure of English Words—(Enroll in Linguistics 70/270.)
4-5 units, Spr (Leben)

102C. Language and Gender—(Enroll in Linguistics 146.)
4 units, Aut (Hall)

103A. African-American Vernacular English—(Enroll in Linguistics 73.)
3-5 units (Rickford) alternate years, given 2001-02

104C. Language and Gender in Contemporary American Fiction—(Same as Linguistics 146B.) (Areas: A,H)
5 units, Win (Heath)

105. The Language of Short Stories—(Same as Linguistics 72.) Close reading of 20th-century British and American short stories, emphasizing perspective. Introduction to recent works in discourse analysis and conversational structure, as they inform the reading of fiction. (Areas: A,H)
GER:3a (DR:7)
3-5 units, Win (Traugott)

205. Old English—Introduction to the earliest English literature in its original language, studying the basics of the Old English language and reading select short prose passages of graduated difficulty. After students have some command of the language, class reads choice Anglo-Saxon poems (including portions of Beowulf).
4-5 units, Aut (Brown)

AREA B: MEDIEVAL

165A. Introduction to Medieval Culture—(Same as History 105A, Medieval Studies 165.) See 65A. GER:3a (DR:7 or 8)
5 units, Win (Brown, Miller)

165B. Arthurian Literature—See 65B.
5 units, Aut (Brown)

165F. From Epic to Romance: Courtly Love and the Heroic Ideal
5 units, Spr (Steidle)

171. Chaucer—The Canterbury Tales, with reference to the historical, social, and aesthetic backgrounds of medieval literature. GER:3a (DR:7)
5 units, Spr (Summit)
211. Readings in Middle English—The language and dialects of Middle English and readings in the various genres of prose and poetry. 4-5 units, Win (Brown)

AREA C: RENAISSANCE

113. The Renaissance—A basic survey of English literature. GER:3a (DR:7)
5 units, Aut (Evans)

151A. Renaissance Poetry
5 units, Spr (Ross)

182F. Seminar: Sex and Violence in Elizabethan Drama—GER:3a (DR:7)
5 units, Win (Riggs)

182G. Seminar: Elizabeth I and Elizabethan Literature—GER:3a (DR:7)
5 units, Win (Summit)

AREA D: SHAKE SPEARE

82Q. Stanford Introductory Seminar: Shakespeare’s Plays—Preference to sophomores. GER:3a (DR:7)
5 units, Aut (Reiholz)

173A. Shakespeare
genot given 2000-01

173B. Shakespeare—GER:3a,4c (DR:7f)
5 units, Win (Parker)

173C. Shakespeare—GER:3a (DR:7)
5 units, Spr (Riggs)

183A. Seminar: Shakespeare and the Specter of Disorder—GER:3a (DR:7)
5 units, Aut (Brooks)

273. Shakespeare
4-5 units, Spr (Riggs)

AREA E: RESTORATION AND 18TH CENTURY

115A. The Comic Mode in Restoration and 18th-Century Literature
5 units, Win (Wahl)

153. Madness and Sensibility—GER:3a (DR:7)
5 units, Aut (Gigante)

163D. Comic Fiction and Its Contexts in the 18th-Century
5 units, Spr (Dickies)

174B. Gender and Politics in English Literature, 1688-1750—After the 1688 “Glorious Revolution,” the struggle between traditional patriarchalism and modern patriarchy marked various texts. Representations of male and female identities in transition, in novels by Behn and Defoe, plays by Southerne, Ptx., and Congreve, poems by Finch, Pope, and Swift. 5 units, Aut (Gabbard)

AREA F: ROMANTIC AND VICTORIAN

132. The 19th-Century English Novel—GER:3a (DR:7)
5 units, Win (Woloch)

154. Major Romantic Poets
not given 2000-01

154D. British Romanticism—GER:3a (DR:7)
5 units, Win (Kaufman)

176B. Two Victorian Autobiographies: David Copperfield and Jane Eyre
5 units, Spr (Paulson)

185E. Seminar: Mary Shelley—GER:3a (DR:7)
5 units, Spr (Gigante)

219. Representation and Repression in Fiction
4-5 units, Spr (Woloch)

230A. The Novel in Europe: The Age of Compromise—1800-1848
4-5 units, Aut (Moretti)

254E. Forms of British Romanticism
4-5 units, Spr (Gigante)

255. Romanticism/Modernism—Romanticism is the dominant cultural and aesthetic ideology of the 19th century, as Modernism is of the 20th. Four pairs of poets are read: Wordsworth/Williams; Coleridge/Stevens; Shelley/Pound; and Keats/H. D. (Hilda Doolittle). (Areas:F,H)
4-5 units, Win (A. Gelpi, B. Gelpi)

276A. Jane Austen
4-5 units, Aut (Alfano)

AREA G: AMERICAN BEFORE 1900

121. American Literature and Culture to 1855—(Same as American Studies 150.) Reading texts from Cotton Mather to Melville, examines the major issues in early American cultural and literary history. Developments in the fine and domestic arts; methodological issues associated with the enterprise called “American Studies.” GER:3a (DR:7)
5 units, Win (Fliegelman)

123D. The Multicultural Moment: American Literature from the Civil War to World War I—GER:3a (DR:7)
5 units, Spr (G. Jones)

164G. California Literary Imagination—(Areas:G,H)
5 units, Spr (J. Moser)

179H. Mark Twain and the Gilded Age—Mark Twain continues to delight and to disturb. How an outrageous “Phunny Phellow,” notorious liar, and irreverent blasphemer became a moral barometer (“the Abraham Lincoln of our literature”) through laughter and satiric wit. Huckleberry Finn and Pudd’nhead Wilson, and short stories, burlesques, and essays are read to gain a qualitative understanding of the literary and cultural discourse of the post-civil war Gilded Age. Focus is on Twain’s literary and comic techniques, and how his complex, mythic, fictions erupt along America’s faultlines of race, gender, and class. 5 units, Aut (Obenzinger)

186B. Seminar: Melville
5 units, Aut (Fliegelman)

186J. Seminar: American Thought and Literature—Jefferson to the Jameses—GER:3a (DR:7)
5 units, Aut (Halliburton)

186K. Seminar: The Social Novel in America—GER:3a (DR:7)
5 units, Spr (G. Jones)

186P. Seminar: Representing Poverty in America, 1840-1940
not given 2000-01

229. American Literature and the Grotesque—(Areas:G,H)
4-5 units, Win (Solomon)
104C. Language and Gender in Contemporary American Fiction—(Same as Linguistics 104C.) (Areas:A,H)
5 units, Win (Traugott)

105. The Language of Short Stories—(Same as Linguistics 72.) See Area A. (Areas:A,H)
3-5 units, Win (Trawtquist)

119G. Literature of World War I
not given 2000-01

125B. American Modernism—GER:3a (DR:7)
5 units, Spr (Solomon)

125C. American Fiction Between the Wars
5 units, Aut (Mallios)

126. Twentieth-Century American Fictions—(Same as Comparative Literature 126.) Readings from traditional masters of modern American literature (Cather, Fitzgerald, Hemingway, Faulkner), and Chicano Modernism (Paredes). The post-WW II period, including African American literature (Gather, Fitzgerald, Hemingway, Faulkner), and Chicano Literature 126A. (Areas:A,H)
126A. Twentieth-Century American Literature
not given 2000-01

126. Twentieth-Century American Fictions—(Same as Comparative Literature 126.) Readings from traditional masters of modern American literature (Cather, Fitzgerald, Hemingway, Faulkner), and Chicano Modernism (Paredes). The post-WW II period, including African American literature (Gather, Fitzgerald, Hemingway, Faulkner), and Chicano Literature 126A. (Areas:A,H)
126A. Twentieth-Century American Literature
not given 2000-01

126. Twentieth-Century American Fictions—(Same as Comparative Literature 126.) Readings from traditional masters of modern American literature (Cather, Fitzgerald, Hemingway, Faulkner), and Chicano Modernism (Paredes). The post-WW II period, including African American literature (Gather, Fitzgerald, Hemingway, Faulkner), and Chicano Literature 126A. (Areas:A,H)
126A. Twentieth-Century American Literature
not given 2000-01

127. American Autobiography—GER:3a (DR:7)
5 units, Spr (Rampersad)

133A. Contemporary British Fiction: From Beckett to the Present
not given 2000-01

137. Development of the Short Story—Required of creative writing students in fiction. Reading/discussion of American, British, and Continental short stories, emphasizing changes and developments in the form. GER:3a,4c (DR:7t)
5 units, Win (Heath)

155A. Modern British Poetry—Survey of several British poets from the 1890s to the present (Thomas Hardy, G. M. Hopkins, D. H. Lawrence, Philip Larkin, Thom Gunn, etc.). GER:3a (DR:7)
5 units, Win (Di Piero)

157A. Modernist Poetry
not given 2000-01

160K. Gender and American Cinema, 1930-1958: The Woman’s Film and Film Noir—See 60K.
5 units, Aut (Ngai)

161A. African-American Writing, 1950-1970—The central literary and intellectual concerns among Afro-American writers, emphasizing the historical and social context. The emergence of the Civil Rights movement of the 1960s, the Black Power/Black Arts movement of the 1960s, and the emergence of a large number of women writers in the second part of the period. Continuities and changes in the work of individual writers over time. The relation between literary style and the artist’s conception of audience and relation to community. Readings, entire and excerpted, from novels, essays, poetry. Authors: James Baldwin, Amiri Baraka, Gwendolyn Brooks, Ralph Ellison, Lorraine Hansberry, Leroi Jones, Martin Luther King, Jr., Malcolm X. GER:3a (DR:7)
5 units, Win (Drake)
187B. Seminar: Central Issues in African-American Intellectual History—GER:3a (DR:7)
5 units, Spr (Drake)

187D. Seminar: Modern British and American Poetry—GER:3a (DR:7)
5 units, Win (Felstiner)

187E. Seminar: British Novels of the '30s not given 2000-01

5 units, Spr (Kaufman)

187M. Seminar: The American Long Poem—GER:3a (DR:7)
5 units, Win (Ngai)

187N. Seminar: W. E. B. Du Bois and American Culture—GER:3a (DR:7)
5 units, Win (Rampersad)

187P. Seminar: Short Story Collections not given 2000-01

187Q. Seminar: Literature of Colonialism and Postcolonialism not given 2000-01


229. American Literature and the Grotesque—(Areas:G,H)
4-5 units, Win (Solomon)

238. The Third World Novel in English not given 2000-01

255. Romanticism/Modernism—See Area F. (Areas:F,H)
4-5 units, Win (A. Gelpi, B. Gelpi)

256F. Black Mountain Poets not given 2000-01

262. Literatures of the Americas—The literary and historiographic methods of representing the discontinuous historical narratives of the New World are examined using a selection of texts from throughout the Americas. How does the way we narrate history influence our perception of past events? What role does fiction play in the construction of national or regional historical identities? What modes are used to narrate history in the Americas: tragedy, comedy or romance, narratives of conquest, apocalypse, or degeneration?
4-5 units, Aut (D. Jones)

277B. Virginia Woolf and Bloomsbury not given 2000-01

277D. Woolf and Eliot 4-5 units, Win (Halliburton)

279D. Joyce not given 2000-01

279F. Finnegans Wake 4-5 units, Win (Bourbon)

287S. Hardy, Eliot, Auden not given 2000-01

AREA P: POETRY AND POETICS

Note—For students declaring an English major during Autumn Quarter 1999 or thereafter, only English 150 satisfies Area P.

92. Reading and Writing Poetry—Introduction to the understanding and writing of poetry. Prerequisite: completion of the writing requirement.
5 units, Aut, Win, Spr (Barot, Cohen)

150. Poetry and Poetics—Introduction to the reading of poetry through a variety of poems, emphasizing the ways the meanings of poems are shaped through diction, imagery, figurative language, and technical elements of verse. GER:3a (DR:7) (WIM)
5 units, Aut (Fields), Win (Lindenberger), Spr (Boland)

192. Intermediate Poetry Writing—See “Creative Writing.”
5 units, Aut, Spr (Cohen)

THEMES AND TOPICS

29. Reading for Writers—Puts into practice Wallace Stegner’s advice to writers: “Writers teach writers how to see and hear.” Read/discuss: The Immense Journey by Loren Eiseley, In the American Grain by William Carlos Williams, China Men by Maxine Hong Kingston, Armies of the Night by Norman Mailer, and A Room of One’s Own by Virginia Woolf. These authors say that “the Great American Novel,” “the Book of the Americas,” the book of heroines has not yet been written. Are readers still interested in such books? Who will write them?
3 units, Win, (Kingston)

100E. Core Seminar: Novel and Epic—(Same as Humanities 194W.)
5 units, Win (Woloch)

166D. Introduction to Critical Theory: Literary Theory and Criticism since Plato—(Same as 266D.) Introduction to the history of literary theory in the Western tradition. Emphasis is on the history of attempts to define, locate, or engage “the literary,” and of attempts to understand it in relation to philosophy, history, politics, sexuality, gender, race, psychology, language, etc. GER:3a (DR:7)
5 units, Spr (Kaufman)

189D. Seminar: Literature and Technology not given 2000-01

4-5 units, Win (Bender, Lenoir, Taylor)

UNDERGRADUATE WORKSHOPS AND DIRECTED READING

191. Expository Writing—Advanced composition, open to undergraduates and graduates and taught through tutorials, short lectures, and general discussion. General instruction in writing.
3 units, Spr (Walters)

194. Individual Research—See section above on “Undergraduate Programs, Opportunities for Advanced Work, Individual Research.”
5 units, any quarter

194T. Research Tutorial—For other opportunities for advanced work, see section above on “Undergraduate Programs, Opportunities for Advanced Work, Individual Research.”
5 units, any quarter
195. Ad Hoc Undergraduate Seminars—Undergraduates (at least three) who wish in the following quarter to study a subject or an area not covered by regular courses, may plan an informal seminar and approach a member of the department to supervise it. A syllabus should be submitted to the director of undergraduate advising at least two weeks before the end of the quarter. No more than 5 units of credit are given for 195 and/or 198 in one quarter. 195 may not be used to fulfill departmental area or elective requirements without permission.

any quarter

196A. Honors Seminar: Critical Approaches to Literature—Required of all juniors in the English honors program.

3 units, Spr (Bourbon)

196B. Honors Essay Workshop—Required of all English honors students.

3 units, Win (T. Moser)

196T. Honors Tutorial

5 units, Aut, Win, Spr (Staff)

197. Senior Honors Essay

10 units in two quarters, Aut, Win, Spr (Staff)

198. Individual Work—Undergraduates who wish to study a subject or an area not covered by regular courses may, with permission, enroll for individual work under the supervision of a member of the department. No more than 5 units of credit are given for 198 and/or 195 in any one quarter. 198 may not be used to fulfill departmental area or elective requirements without permission. Group seminars are not considered appropriate to 198.

any quarter

199. Senior Independent Study—Open, with department approval, to seniors majoring in English who wish to work throughout the year on a 10,000 word critical or scholarly essay (see “Note” under honors program in English). Applicants should submit a sample of their expository prose and a proposed topic for independent study with a bibliography to the Director of Undergraduate Studies, before preregistration in May of the junior year. Each student accepted is responsible for finding a department faculty director.

10-15 units in three quarters, Aut, Win, Spr (Staff)

CREATIVE WRITING

90. Fiction Writing—Basic problems of narrative and imaginative writing. Prerequisite: completion of the writing requirement.

3 units, Aut, Win, Spr (Brown, Dorst, Harty, MacDonald, McCollum, Orozco)

92. Reading and Writing Poetry—See Area P.

5 units, Aut, Win, Spr (Barot, Cohen)

190. Intermediate Fiction Writing—May be taken twice. For admission, manuscript must be submitted to Creative Writing Office by last day of preceding quarter. Prerequisite: 90.

5 units, Aut, Win, Spr (Brown, Harty, Orozco, Tallent)

192. Intermediate Poetry Writing—May be taken twice. For admission, manuscript must be submitted to the Creative Writing office by the last day of preceding quarter. Prerequisite: 92.

5 units, Aut, Spr (Cohen)

290A. Advanced Fiction Writing—Students are selected by the instructor. Promising fiction writers who have completed the 90 and 190 workshops engage in practical criticism, the actual difficulties and challenges of refining a short story, draft to draft. Manuscripts must be submitted to the Creative Writing office by the last day of the preceding quarter.

4-5 units, Spr (MacDonald)

292. Advanced Poetry Writing—Students are selected by the instructor. Promising student poets write poetry in an atmosphere of mutual aid. Manuscripts must be submitted to the Creative Writing office by December 15.

4-5 units, Win (Fields)

293. Seminar in Literary Translation—After examining versions of Baudelaire, Rilke, Neruda, Pagis, Shakespeare, Keats, Dickinson, Whitman, Yeats, Eliot, Frost, and Duncan, students pursue and present their own work in progress, discussing practical and theoretical questions.

4-5 units, Spr (Felstiner)

390. Graduate Fiction Workshop—Primarily for Stegner Fellows in the writing program. May be repeated for credit. Prerequisite: consent of instructor.

3 units, Aut (L’Heureux)

Win (Tallent)

Spr (Wolff)

392. Graduate Poetry Workshop—Primarily for Stegner Fellows in the writing program. May be repeated for credit. Prerequisite: consent of instructor.

3 units, Aut (Fields)

Win (Boland)

Spr (Di Piro)

ADVANCED UNDERGRADUATE/GRADUATE

205. Old English—See Area A. (Area:A)

4-5 units, Aut (Brown)

209. Introduction to Paleography and Codicology—Introduction to the study of late antique and medieval manuscripts in Latin, of medieval Latin and vernacular scripts, and of the materials and composition of the medieval book.

not given 2000-01

211. Readings in Middle English—The language and dialects of Middle English and reading in the various genres of prose and poetry. (Area:B)

4-5 units, Win (Brown)

219. Representation and Repression in Fiction

4-5 units, Spr (Woloch)

229. American Literature and the Grotesque—(Areas:G,H)

4-5 units, Win (Solomon)

230A. The Novel in Europe: The Age of Compromise—1800-1848

4-5 units, Aut (Moretti)

230B. The Novel in Europe 1850-1900

4-5 units, Win (Moretti)

238. The Third World Novel in English

not given 2000-01

255. Romanticism/Modernism—See Area F. (Areas:F,H)

4-5 units, Win (Gelpi, B. Gelpi)

256F. Black Mountain Poets

not given 2000-01

260A. American Literature and the Politics of Language

not given 2000-01
262. Literatures of the Americas—See Area H.
4-5 units, Aut (D. Jones)

263. Undergraduate Colloquium: Bodyworks—Medicine, Technology, and the Body in Late 20th-Century America—(Same as Comparative Literature 274A, History 274A.) See Themes and Topics.
4-5 units, Win (Bender, Lenoir, Taylor)

266D. Introduction to Critical Theory: Literary Theory and Criticism since Plato—See 166D.
4-5 units, Spr (Kaufman)

273. Shakespeare
4-5 units, Spr (Riggs)

276A. Jane Austen
4-5 units, Aut (Alfano)

277B. Virginia Woolf and Bloomsbury
not given 2000-01

277C. Woolf and Eliot
4-5 units, Win (Halliburton)

279D. Joyce
not given 2000-01

279F. Finnegans Wake
4-5 units, Win (Bourbon)

287S. Hardy, Eliot, Auden
not given 2000-01

293. Seminar in Literary Translation—After examining versions of Baudelaire, Rilke, Neruda, Celan, Pagis, Shakespeare, Keats, Dickinson, Whitman, Yeats, Eliot, Frost, and Duncan, students pursue and present their own work in progress, discussing practical and theoretical questions. Prerequisite: see instructor during previous quarter.
4-5 units, Spr (Felstiner)

301A. Colloquium: Cultures of the Medieval Book
4-5 units, Aut (Summit)

302A. Theater and Religion in Renaissance England
4-5 units, Win (Riggs)

302H. Colloquium: The Reformation in English Literature
not given 2000-01

303. Colloquium: 18th-Century Geographies
not given 2000-01

303A. Colloquium: High and Low Life—Polite and Popular Forms in 18th-Century Literature
not given 2000-01

not given 2000-01

305. Colloquium: Literature and Tourism
4-5 units, Win (Dekker)

306. Colloquium: American Enlightenment
not given 2000-01

308. Colloquium: Ralph Ellison and American Culture
4-5 units, Spr (Rampersad)

308E. Colloquium: Representing Poverty in America
4-5 units, Win (G. Jones)

312A. Feminist Rhetoric
4-5 units, Win (Lunsford)

315E. Lyric Economies in the European Renaissance—(Enroll in Comparative Literature 315E.)
4-5 units, Spr (Hampton)

314. Epic and Empire—(Same as Comparative Literature 314.) Focusing on Virgil’s Aeneid and its influence, traces the European epic tradition (Ariosto, Tasso, Camoes, Spenser, and Milton) to New World discovery and mercantile expansion in the early modern period.
5 units, Spr (Parker)

317E. Crowds—(Enroll in Comparative Literature 317E, French 317E, Italian 317E.)
5 units, Spr (Schnapp)

356. Seminar: Whitman and Dickinson
not given 2000-01

356C. Seminar: Pound’s Cantos
4-5 units, Spr (A. Gelpi)

359. Seminar: Transnational Poetics—(Same as Comparative Literature 359F.)
4-5 units, Aut (Saldivar)

360. Seminar: Theories of Narrative and Genre—(Same as Linguistics 360.)
4-5 units, Aut (Heath)

362A. Seminar: Modernism, Race, and Modernity
4-5 units, Win (D. Jones)

362N. Critical Concepts in Chicana/o Literature—(Enroll in Spanish 380E.)
3-5 units, Spr (Yarbro-Bejarano)

363. Seminar: The Bourgeois
4-5 units, Aut (Moretti)
Seminar: How Do Metaphors Mean?—Theories of metaphor (framed historically and philosophically), especially as such theories form parts of particular aesthetics and theories, and modes of interpretation. Such theories are matched with metaphors collected from ordinary conversation, and from and in relation to poetry and fiction. Aesthetics, rhetoric, language, and how texts "mean or do not mean."

4-5 units, Spr (Bourbon)

Seminar: American Literature and Culture in the 1840s
4-5 units, Aut (Fliegelman)

Seminar: Chaucerian Inheritances—The Production of Literary Authority
4-5 units, Win (Kuskin)

Seminar: Shakespeare—Text and Performance
not given 2000-01

Seminar: Shakespeare
4-5 units, Win (Parker)

Seminar: Early 20th-Century Avant-Garde
not given 2000-01

The Theory of the Text—(Enroll in Comparative Literature 300.)
5 units, Win (White)

Seminar: Realist Theory and the Predicament of Postmodernism
not given 2000-01

Modern Seminar—(Enroll in Interdisciplinary Studies in Humanities 314.)
3-5 units, Aut (Bourbon)

Introduction to Graduate Study for Ph.D. Students
5 units, Aut (Bender)

WORKSHOPS AND DIRECTED READING

Advanced Work in Writing and Criticism
any quarter

Independent Study—Preparation for qualifying examination and for the Ph.D. oral examination.
any quarter

Ad Hoc Graduate Seminars—Three or more graduate students who wish in the following quarter to study a subject or an area not covered by regular courses and seminars may plan an informal seminar and approach a suitable member of the department to supervise it.
any quarter

Laboratory in Pedagogy—Required for first-year Ph.D. students in English, Modern Thought and Literature, and Comparative Literature (except for Comparative Literature students doing their teaching in a foreign language). Preparation for serving as teaching assistants in undergraduate literature courses. Focus is on leading discussions and grading papers.
2 units, Aut (Bender, Fishman)

Pedagogy Seminar I—Seminars and apprenticeship for second-year graduate students in English, Modern Thought and Literature, and Comparative Literature teaching in the Writing and Critical Thinking Program. Each student is assigned as an apprentice to an experienced teacher and sits in on classes, conferences, and tutorials, with eventual responsibility for conducting a class, grading papers, and holding conferences. Meetings explore rhetoric, theories and philosophies of composition, and the teaching of writing. Readings in rhetoric, composition, and pedagogy support seminar discussion. Each student designs a two-quarter syllabus in preparation for teaching English 1 and 2.
0-5 units, Aut (Lunsford)

Pedagogy Seminar II—Seminar for second-year graduate students teaching the first quarter of composition in the Writing and Critical Thinking Program. Focus is on the students' concurrent teaching and preparation for teaching the second quarter of the sequence.
0-5 units, Win (Lunsford)

Research Course—A special subject of investigation under supervision of some member of the department. Thesis work is not registered under this number.
any quarter

Writing for Academic Publication—Designed for doctoral students in the humanities and social sciences. Examination of the origins and institutional alignments of academic journals, their internal and surrounding genres, and shifts of style preference for text and references. Key "classics" of journal articles, debates around academic publishing, and recent innovations in the shapes of articles, reviews, and responses form the background to preparation of one or more pieces for submission.
not given 2000-01

Revision and Development of a Paper—Students revise and develop a paper under the supervision of a faculty member with a view to possible publication.
5 units, any quarter

Thesis
3 units, any quarter

Program in Ethics in Society

Director: Debra Satz (Philosophy)
Steering Committee: Christopher Bobonich (Philosophy), Arnold Eisen (Religious Studies), John Perejoh (Political Science), Barbara Koenig (Center for Biomedical Ethics), Susan Okin (Political Science), Rob Reich (Political Science), Bill Simon (Law)
Affiliated Faculty: Kenneth Arrow (Economics, emeritus), Donald Barr (Human Biology), Barton Bernstein (History), Michael Bratman (Philosophy), Albert Camarillo (History), Agnieszka Jaworska (Philosophy), David Kennedy (History), David K. Stevenson (Pediatrics), Sylvia Yanagisako (Cultural and Social Anthropology), Lee Yearley (Religious Studies)

The Program in Ethics in Society is designed to foster scholarship, teaching, and moral reflection on fundamental issues in personal and public life. The program is grounded in moral and political philosophy, but it extends its concerns across a broad range of traditional disciplinary domains. The program is guided by the idea that ethical thought has application to current social questions and conflicts, and it seeks to encourage moral reflection and practice in areas such as business, international relations, law, medicine, politics, and science.

Current and planned initiatives of the program include:

1. Supporting and fostering ethics research.
2. Supporting innovative teaching focusing on the ethical dimensions relevant to the different disciplines across the curriculum.
3. Establishing a yearly faculty-graduate seminar focusing on topics in ethics and public life.

The program also sponsors several public lecture series, including the Wesson Lectures in Problems of Democracy and the Ethics in Society lecture series on a current social issue.
Students interested in pursuing studies that bring moral and political theory to bear on issues in public life should consult the director.

UNDERGRADUATE PROGRAM
HONORS

The honors program in Ethics in Society is open to majors in every field and may be taken in addition to a department major. Students should apply for entry at the end of Spring Quarter of the sophomore year or at the beginning of the Autumn Quarter of the junior year. Applicants should have a cumulative grade point average (GPA) of ‘B+’ or higher. They should also maintain this minimum average in the courses taken to satisfy the requirements.

Requirements—

1. Required courses:
   a) Philosophy 20, Introduction to Moral Theory, or Philosophy 170. This is normally taken in the sophomore year.
   b) Philosophy 30, Introduction to Political Philosophy (same as Public Policy 103A), or Philosophy 171. This is normally taken in the sophomore year. At least one of (a) and (b) must be taken at the upper level.
   c) Ethics in Society 77, The Ethics of Social Decisions (same as Philosophy 77). Ethics in Society honors students must enroll under Ethics in Society. This course is aimed primarily at the junior year and is taken upon admission to the honors program.

2. One 4- or 5-unit undergraduate course on a subject approved by the honors adviser, designed to encourage students to explore those issues in Ethics in Society that are of particular interest to them. Courses of relevance to the Program in Ethics in Society are offered by members of the program committee and by other departments. Students may also take a course with the honors thesis in mind. To promote a broad interdisciplinary approach, this elective should normally be outside the Department of Philosophy. Students are not restricted to choosing from the sample of such courses included below.


4. Ethics in Society 200A,B, Honors Thesis, on a subject approved by the honors adviser, 8-10 units, with the work spread over two quarters.

A typical student takes Philosophy 20 or 170 and 30 or 171 in the sophomore year. Upon admission to the honors program as a junior, he or she takes Ethics in Society 190 in the Winter Quarter, Ethics in Society 77 in the Spring Quarter, and requirement 2 (the optional subject) at any time during the junior year, or possibly Autumn Quarter of the senior year. The honors thesis is normally written during the Autumn and Winter quarters of the senior year.

GRADUATE STUDIES

In addition to the Ethics in Society Lecture Series, the program’s main provision for graduate students is a seminar on a topic in applied ethics. Students present talks on normative themes of their own choosing, providing an opportunity for graduate students from different disciplines to interact in the process of deliberating over ethical matters of common interest.

COURSES

UNDERGRADUATE

For course information not listed, refer to the relevant department listings elsewhere in this bulletin. See the Time Schedule each quarter for any changes in listings.

20. Introduction to Moral Theory—(Enroll in Philosophy 20.) What is the basis of our moral judgments? What makes right actions right and wrong actions wrong? (Existing social rules? The consequences of human happiness? Conformity to a rule of reason?) What sort of person is it best to be? The answers to these classic questions about ethics are examined in the works of traditional and contemporary authors.
3 units, Win (Perry)

30. Introduction to Political Philosophy/Theory—(Enroll in Philosophy 30, Public Policy 103A.) Critical introduction to issues of state authority, justice, liberty, and equality. The issues are approached through major works in political philosophy. Topics: human nature and citizenship, the obligation to obey the law, democracy and economic inequality, equality of opportunity and affirmative action, religion and politics. Readings: Locke, Rousseau, Mill, Marx, and Rawls, and some cases of practical application, including Supreme Court cases.
5 units, Aut (Satz)

65. Introduction to Comparative Studies in Race and Ethnicity—(Enroll in History 65.)
4 units, Spr (Camarillo)

77. The Ethics of Social Decisions: Issues in Surrogate Decision-Making—(Same as Philosophy 77.) Decision-making for others as it occurs in government representation; and in the advocacy of children, the physically and mentally ill, animals, and the environment.
4 units, Spr (Rosner)

78. Medical Ethics—(Enroll in Philosophy 78.)
4 units, Spr (Jaworska)

100. Computers, Ethics, and Social Responsibility—(Enroll in Computer Science 201.)
4 units, Spr (Roberts)

110. Ethics and Public Policy—(Enroll in Science, Technology, and Society 110; Public Policy 103B.)
5 units, Win (McCinn)

140A,B,C. Ethics of Development in a Global Environment (EDGE)—(Enroll in Cultural and Social Anthropology 133A,B,C; Engineering 297A,B,C.)
1-4 units, Aut, Win, Spr (Lusignan, Gupta)

143. Ethics in Economics: Equity, Efficiency, and Rights—(Enroll in Economics 143.)
5 units, Spr (Hammonds)

150. Economic Analysis I—(Enroll in Economics 150, Public Policy 104.)
5 units, Win (Noll)

151A,B. Undergraduate Colloquium: Poverty and Homelessness in America—(Enroll in History 251A,B.)
8 units (Camarillo) not given 2000-01

156. Economics of Health and Medical Care—(Enroll in Economics 156, Health Research and Policy 256, Biomedical Informatics 256.)
5 units, Win (McCelland)

158R. Children's Citizenship: Justice across Generations—(Enroll in Political Science 158R.)
5 units (Reich) given 2001-02

159R. Ethics and Politics in Public Policy—(Enroll in Political Science 159R.)
5 units, Win (Reich)

170. Ethical Theory—(Enroll in Philosophy 170.)
4 units, Win (Jaworska)

171. Political Philosophy—(Enroll in Philosophy 171.)
4 units, Aut (Hussain)
172. History of Modern Ethical Theory—(Enroll in Philosophy 172.)
4 units, Aut (Schaprio)

174. Bioethics and Anthropology—(Enroll in Anthropological Sciences 174.)
5 units Spr (Koenig)

174A. The Bounds of Moral and Political Obligation—(Enroll in Philosophy 174.)
4 units, Win (Rosner)

177. Philosophical Issues Concerning Race and Racism—(Enroll in Philosophy 177.)
4 units, Spr (Satz)

179. Individual and Communal Ethics—(Enroll in Philosophy 179.)
4 units, Spr (Moravcsik)

190. Ethics in Society Honors Seminar—(Same as Philosophy 178.)
Interdisciplinary. Students present issues of public and personal morality; topics are chosen with the advice of the instructors. Student-prepared reading list is made available a week prior to the presentation. Group discussion follows.
3 units, Win (Reich)

200A, B. Honors Thesis—Limited to Ethics in Society honors students.
8-10 units, any two quarters (Staff)

266. Seminar: Gender and Western Political Theory—(Enroll in Political Science 266.)
5 units (Okin) not given 2000-01

268. Seminar: Contemporary Theories of Justice—(Enroll in Political Science 268.)
5 units, Spr (Reich)

271. Ethics: Topics in Democratic Theory—(Enroll in Philosophy 271.)
3-5 units (Ferejohn, Satz) not given 2000-01

275. Marx and Weber—(Enroll in Philosophy 275.)
3 units, Win (Satz)

317. Aristotle's Ethics—(Enroll in Philosophy 317.)
3 units, Spr (Bobonich)

**FEMINIST STUDIES**

Co-Chairs: Penny Eckert, Estelle Freedman

Program Committee:
Faculty: Penny Eckert, Estelle Freedman, Sarah Jain, Yoshiko Matsumoto, Cecilia Ridgeway, Jennifer Summit
Graduate Students: Rachel Jean-Baptiste, Christina Wotipka
Undergraduates: Krista Glaser, Michelle Thong
Staff: Ben Davidson, Laura Harrison, Cathy Jensen, Mary Stiles, Ineko Tsuchida, Lisa Webb

Resource Faculty and Staff:
Anthropological Sciences: Hill Gates
Art and Art History: Wanda Corn, Pamela Lee (on leave), Suzanne Lewis, Melinda Takeuchi
Asian Languages: Yoshiko Matsumoto
Biological Sciences: Joan Roughgarden
Business: Joanne Martin, Sonja Grier
Chemistry: Carl Djerassi
Classics: Joy Connolly, Maud Gleason, Susan Stephens, Yasin Syed
Comparative Literature: Leah Middlebrook, Patricia Parker

Cultural and Social Anthropology: Paulla Ebron (on leave), Carol Delaney, Akhil Gupta on leave, Miyako Inoue, Sarah Jain, Matthew Kohrman, Sandra Lee, Purnima Mankekar (on leave), Ann Stoler, Sylvia Yanagisako

Drama: William Eddelman, Harry J. Elam, Cherrie Moraga, Peggy Phelan

Education: Jo Boaler, Susan Christopher, Susanna Loeb, Myra Strober, Joy Williamson

English: Eavan Boland (on leave), Terry Castle (on leave), Sandra Drake, Barbara Gelpi, Maureen Harkin (on leave), Diane Middlebrook, Paula Mooy (on leave), Siannie Ngai, Stephen Orgel, Ramon Saldívar, Jennifer Summit, Elizabeth Tallent

Feminist Studies: Kristin Cobb, Patricia Karlin-Neumann, Susan Krieger, Tirza Latimer, Celine Parrenas, Leslie Townsend

French and Italian: Brigitte Cazelles, Carolyn Springer

German Studies: Russell Berman, Karen Kenkel, Sara Poor, Kathryn Strachota

History: Joel Beinin, Phillipe Buc, Paula Findlen, Estelle Freedman, Kennell Jackson, Nancy Kollmann, Carolyn Lougee, Paul Robinson, Mary L. Roberts, Michael Thompson

Human Biology: Ellen Porzig

Law: Barbara Babcock, Margaret Radin, Deborah Rhode

Library: Kathryn Korns

Linguistics: Penny Eckert, Shirley Heath

Medical School: Anne Arvin, Helen Blau, Roy King, Cheryl Koopman, Herbert Lieberman, Iris Litt

Music: Heather Hadlock (on leave)

Philosophy: Agnieszka Jaworska, Debra Satz

Political Science: Terry Karl, Susan Okin, Carolyn Wong

Psychology: Albert Bandura, Laura Carstensen, Hazel Markus

Religious Studies: Rudy Busto, Charlotte Ponrht, Hester Gelber

Slavic Languages and Literatures: Monika Greenleaf

Sociology: Cecilia Ridgeway

Spanish and Portuguese: Claire Fox, Marie Paz Haro, Mary L. Pratt (on leave), Yvonne Ybarro-Bejarano

Feminist Studies is an interdisciplinary undergraduate program investigating the significance of gender in all areas of human life. Feminist analysis is based on the assumption that gender is a crucial factor in the organization of our personal lives and our social institutions. It focuses on how gender differences and gender inequality are created and perpetuated. The courses offered by the program use feminist perspectives to expand and reevaluate the assumptions at work in traditional disciplines in the study of individuals, cultures, social institutions, policy, and other areas of scholarly inquiry.

The Program in Feminist Studies coordinates the courses offered on women, gender, sexuality, and feminism throughout the University and facilitates the undergraduate major and minor in Feminist Studies. In addition, it seeks to encourage feminist analysis and teaching at Stanford, both in courses instituted within the program and those housed within departments.

The committee awards the annual Michelle Z. Rosaldo and Francisco Lopes prizes for the best undergraduate essays on women, gender, or feminism. The prizes are awarded in two divisions: a thesis division for senior honors theses and masters’ papers written by undergraduates in coterminal degree programs, and an essay division. The Rosaldo prizes are awarded for the best work in the social sciences and the Lopes prizes for the best work in the humanities. Submissions are due in the Feminist Studies office April 17 for essays and May 23 for theses. Essays and theses completed later in Spring Quarter may be submitted for consideration the following year.

**UNDERGRADUATE PROGRAMS**

**BACHELOR OF ARTS**

The major in Feminist Studies may be taken as a single major, as one major of multiple majors, or as a secondary major. If taken as one major of multiple majors, none of the 60 units counted toward the major in Feminist Studies may overlap with units counted toward the major in
other departments or program. But if taken as a secondary major, then up to 30 of the units counted toward the Feminist Studies major may also be counted toward fulfilling the major requirements in another department or program if that department or program consents. A maximum of 10 of the 60 units for the major may be taken on a satisfactory/no credit basis; a maximum of 10 may be taken as independent study or directed reading. FS core courses (101, 102, 103, 104) must be taken for a letter grade only.

Students interested in Feminist Studies should consult with the chair or program coordinator during sophomore year. The major should normally be declared by the beginning of a student's third year, and must be declared by the senior year. Curriculum guidelines are available at the Feminist Studies office in Serra House, telephone (650) 723-2412, or visit the web site at www.stanford.edu/dept/femstudies. Majors should choose two faculty advisers, one of whom is usually the chair of the program, from the list of resource faculty (see above) and may consult with peer advisers. Faculty advisers work closely with the student in helping design an appropriate program of study. A proposal explaining the rationale for the plan of study and signed by both advisers must be submitted to the program office. The program office arranges a meeting between the student, chair, and the other adviser at the student’s request.

CURRICULUM

The following course of study is recommended for a major in Feminist Studies: a minimum of twelve courses (a core of five plus seven others) for a total of at least 60 units. The seven courses not in the core should be chosen in consultation with the student’s advisers. To ensure coverage, intellectual focus and breadth in the program, and practical experience, the twelve courses required for the major should be distributed among the core (five courses), the focus (at least five courses), and electives. A practicum (FS 104) is also required, in addition to the twelve courses above. At least one course must focus on cross- or multicultural feminist studies.

CORE

The core consists of five courses. The first three are required and the remaining two should be chosen from the list of feminist studies courses. One of these courses should be in the social sciences, the other in the humanities.

Courses that fulfill the social science requirement in the Feminist Studies (FS) major can be found among courses listed under Anthropological Sciences, Communications, Cultural and Social Anthropology, Education, History, Human Biology, Law, Linguistics, Medicine, Political Science, Psychology, and Sociology. Courses that fulfill the humanities requirement in the Feminist Studies major can be found among courses listed in English, Philosophy, Religious Studies, the arts, and languages.

Required Courses—FS 101 (Introduction to Feminist Studies), 102 (a theory course), and 103 (a methodology course). 101 is a prerequisite for FS 102 and 103.

FOCUS

Of the seven courses not part of the core, at least five should reflect a particular thematic focus, and all seven should be chosen in consultation with the student’s advisers.

1. At least three of the focus courses should be Feminist Studies courses or be selected from the list of affiliated courses in other departments and programs (see below).
2. At least one should be a major survey, methodology, or theory course offered by a department or interdepartmental program as an initiation into the practice of study in the field.

The following thematic clusters illustrate foci that individual students can design, in consultation with their advisers:

Cross-Cultural Perspectives on Gender
Feminist Perspectives on Science, Technologies, and Health
Gender and Education
Gender and Popular Culture

Lesbian, Gay, Bisexual Studies
Medieval Gender Studies
Women and Health
Women and Modernity
Women and Religion
Women and Work
Women in Language and Symbol

PRACTICUM

For Feminist Studies majors, the practicum, taken for 3 to 6 units, should involve field research, community service, or other supervised research. This requirement may be fulfilled by designing a public service internship or by undertaking supervised work in a department. The practicum should be completed by Autumn Quarter of the student’s senior year. To receive credit in Feminist Studies 104 (WIM), a senior seminar, majors present oral reports, a draft, and a revised paper on the relationship of the practicum to their academic work.

MINORS

The minor in Feminist Studies consists of at least six courses, for a minimum of 30 and a maximum of 36 units. The first two “Core” courses must be taken in sequence; the remaining four “Focus” courses may be taken in any order. The core consists of FS 101 (Introduction to Feminist Studies) and either 102 (a theory course) or 103 (a methodology course). The four-course thematic focus may be designed by the student or may follow one of the suggested clusters listed above. One course within the thematic focus should address cross-cultural issues. None of the units for the minor may count towards the student’s major. The minor in Feminist Studies should be declared by the Winter Quarter of a student’s junior year.

A student who wishes to minor in Feminist Studies should complete a minor draft proposal and discuss the minor with one faculty adviser, selected from the Feminist Studies Resource Faculty list. The student should submit a Departmental Minor Declaration Form via the Web through the Registrar’s Office Home Page at www.stanford.edu/dept/registrar. The program office can also direct the student to a peer adviser.

HONORS CERTIFICATION

FEMINIST STUDIES MAJORS

Admission—The honors program offers an opportunity to do supplemental independent research on a thesis of superior academic quality. It is open to students with a grade point average (GPA) of ‘B+’ or better in course work in Feminist Studies. Normally, students apply for honors certification in the junior year, or, at the latest, Autumn Quarter of the senior year. To apply, students should design a project in consultation with both of their major advisers. A proposal signed by both advisers, describing the project and including the number of units to be awarded, must be submitted to the chair of the program for final approval. Application forms are available in the Feminist Studies program office and on the Feminist Studies web page.

Requirements—Students enroll in FS 105 for 10-15 units, which are taken in addition to those units already approved for the major. In addition to completing all the units proposed, the student submits in the senior year two preliminary drafts and a final thesis based on substantial research. The final thesis must be submitted three weeks before exam week during Spring Quarter on May 23.

MAJORS IN OTHER DEPARTMENTS

Honors Certification in Feminist Studies for majors in other departments or programs, as distinguished from honors for students pursuing a major in Feminist Studies, is intended to complement study in any major. Students in any field of study are encouraged to apply.

Admission—Honors certification is open to students majoring in any field who have completed Feminist Studies 101 and 102 with a GPA of ‘B+’ or better, or who have taken three Feminist Studies courses related to the topic of their proposed honors research. Normally, students apply for honors certification no later than the third quarter of the junior year. To apply, students must first consult the Chair of the Program in Femi-
nist Studies outlining the plan for course work, the rationale for the program, and an honors project. The chair acts as one of the student's faculty advisers and helps the student select two other faculty advisers to supervise the student's progress.

Requirements—

1. Thirty units of course work in addition to the units granted for the honors program.
   a) 15 units of core courses: Feminist Studies 101, 102, and 103.
   b) Select the remaining 15 units, in consultation with advisers, from the list of courses approved by the Feminist Studies program. None of the courses selected may simultaneously count toward the student's major.
2. Submit in the senior year two preliminary drafts, and then a final draft, of a thesis based on substantial research. The thesis must be of acceptable quality on an aspect of Feminist Studies approved by the student's faculty advisers. The final draft must be submitted three weeks before the end of exam week during Spring Quarter (on May 23). Students enroll in FS 105 for 10-15 units of credit for preparation of the honors thesis, but these units do not count toward requirement '1.'

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

Courses listed under the Core and Interdepartmental Offerings contain a significant component of attention to gender difference, the situation of women in Western or non-Western cultures, or the role of sex-gender systems in social organization. Some courses are planned after this bulletin is printed. Updated listings, including courses not offered 2000-01, are available at the Feminist Studies office and on the web site at www.stanford.edu/dept/femstudies.

CORE

101. Introduction to Feminist Studies—(Same as History 173C.) How gender inequality is created and perpetuated, and when feminist theory and movements emerge to respond to gender inequality. Topics: theories of inequality, history of feminism; international and multicultural perspectives on feminism; women's work, health, and sexuality; creativity, spirituality; and movements for social change. GER:3b, 4c (DR:9) 5-6 units, Win (Freedman)

102G/202G. Feminist Media Theories—(Enroll in German Studies 171A.) Feminist Anglo-American and European theories of popular culture, including social, political, and psychoanalytic approaches. The critical power and limitations of theories are tested against particular culture, including social, political, and psychoanalytic approaches. The critical power and limitations of theories are tested against particular culture, including social, political, and psychoanalytic approaches. Required: a 3-5 page paper evaluating the internship and its relevance to Feminist Studies. 4 units, Spr (Krieger)

102L. Feminist Theories of Work and Families—(Same as Education 196X.) A critical introduction to feminist theories of work, families, and the interactions between the two. The economic, sociological and legal perspectives; mainstream and feminist theories are contrasted. Emphasis is on the present day U.S. with issues in other countries and/or other historical periods. Topics: labor force participation, occupational segregation, labor market discrimination, emotional labor, unpaid work, caring labor, child care, combining work and family, single-parent families, poverty, marriage, and divorce. 4-5 units, Spr (Strober)

103B/203B. Subjectivity in Feminist Research—The development of each student's personal voice in feminist research and writing. Emphasis is on the diversity of women's experiences, fostering skills in personal essay writing. Prerequisites: 101, consent of instructor. 5 units, Spr (Krieger)

104. Practicum/Senior Seminar—For Feminist Studies majors only. Two-quarter, biweekly senior seminar. Students present oral reports on the relationship of the practicum to their academic work, submit a draft and revised written analysis of the practicum, and discuss applications of feminist scholarship. Honors majors also begin thesis work in the seminar. (WIM)

3-6 units, Aut, Win (Townsend)

105, 106. Honors Work

108. Internship in Feminist Studies—For non-majors. Augments relevant course work in Feminist Studies with a supervised field, community, or lab experience, e.g., law offices, medical research and labs, social service agencies, legislative and other public offices, and local and national women's organizations. One credit represents approximately three hours work per week during a 10 week quarter. Required: a 3-5 page paper evaluating the internship and its relevance to Feminist Studies. Must be arranged in advance through the program office (see application form on our web page). Prerequisites: at least one course in Feminist Studies, written consent of faculty sponsor. (CR/NC)

109. God and Gender: Christianity through the Eyes of Women—(Enroll in Religious Studies 109.)


117. Gender, Violence, and the Body in Ancient Religion—(Enroll in Classics 117.)

195. Directed Reading

23N. Cross-Cultural Perspectives on Love—(Enroll in Classics 36N.)

36N. Stanford Introductory Seminar: Gay Autobiography—(Enroll in History 36N.)

65. American Musical Theater: Broadway/Hollywood—(Enroll in Drama 65.)

77. Japanese Society and Culture—(Enroll in Cultural and Social Anthropology 77.)

71N. Stanford Introductory Seminar: Language and Gender in Japan—Myths and Reality—(Enroll in Asian Languages 71N.)

84Q. Stanford Introductory Seminar: Shakespeare, Playing, Gender—(Enroll in Comparative Literature 84Q.)


117. Gender, Violence, and the Body in Ancient Religion—(Enroll in Classics 117.)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Enroll in</th>
<th>Credits</th>
<th>Units Required</th>
<th>Taught By</th>
</tr>
</thead>
<tbody>
<tr>
<td>126</td>
<td>Adolescent Development</td>
<td>Human Biology 126</td>
<td>4 units</td>
<td>Win (S. Feldman)</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>Gender and Education</td>
<td>Education 170</td>
<td>4 units</td>
<td>Aut (Christopher)</td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>Science, Technology, and Gender</td>
<td>Cultural and Social Anthropology 132</td>
<td>5 units</td>
<td>Win (Jain)</td>
<td></td>
</tr>
<tr>
<td>134D</td>
<td>Medieval Women</td>
<td>German Studies 134P</td>
<td>4 units</td>
<td>Win (Poor)</td>
<td></td>
</tr>
<tr>
<td>139</td>
<td>Rereading Judaism in Light of Feminism</td>
<td>Jewish Studies 139A</td>
<td>4-5 units</td>
<td>Spr (Karlin-Neumann)</td>
<td></td>
</tr>
<tr>
<td>140R</td>
<td>Health Issues in Young Women</td>
<td></td>
<td></td>
<td>Win (Wotipka)</td>
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<tr>
<td>140S</td>
<td>Sex and Gender in Classical Hollywood Cinema: Making Woman Asian</td>
<td></td>
<td></td>
<td>Win (Cobb)</td>
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<tr>
<td>140T</td>
<td>Mini Seminar: Cultural Alternatives: Paris Between the Wars</td>
<td></td>
<td></td>
<td>2 units, Aut (Latimer)</td>
<td></td>
</tr>
<tr>
<td>141</td>
<td>Contemporary Spanish Women Writers</td>
<td>Spanish and Portuguese 141</td>
<td>3-5 units</td>
<td>Win (Haro)</td>
<td></td>
</tr>
<tr>
<td>149</td>
<td>Theories of Race and Ethnicity; A Comparative Perspective</td>
<td>Cultural and Social Anthropology 149</td>
<td>5 units</td>
<td>Win (Yanagisako)</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>Language in Society</td>
<td>Linguistics 150</td>
<td>4-5 units</td>
<td>Spr (Eckert)</td>
<td></td>
</tr>
<tr>
<td>150A</td>
<td>African-American History to the 20th Century</td>
<td>History 150A</td>
<td>5 units</td>
<td>Aut (M. Thompson)</td>
<td></td>
</tr>
<tr>
<td>150C</td>
<td>Introduction to Chicana/o Life and Culture</td>
<td>Cultural and Social Anthropology 150C</td>
<td>5 units</td>
<td>Win (Rosaldo, Yanagisako)</td>
<td></td>
</tr>
<tr>
<td>160A</td>
<td>Dance, Gender, and History</td>
<td>Dance 160</td>
<td>3-4 units</td>
<td>Win (Ross)</td>
<td></td>
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<tr>
<td>160B</td>
<td>Dance and Live Art in the 20th Century</td>
<td>Dance 161</td>
<td>3-4 units</td>
<td>Spr (Ross)</td>
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<tr>
<td>160K</td>
<td>Gender and American Cinema, 1930-1950: The Woman's Film and Film Noir</td>
<td>English 160K</td>
<td>3-5 units</td>
<td>Aut (Ngai)</td>
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</tr>
<tr>
<td>161A</td>
<td>African-American Writing, 1950-1970</td>
<td>English 161A</td>
<td>5 units</td>
<td>Win (Drake)</td>
<td></td>
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<tr>
<td>162</td>
<td>Psychology of Gender</td>
<td>Psychology 162</td>
<td>4 units</td>
<td>Win (Carstensen)</td>
<td></td>
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<tr>
<td>164</td>
<td>Orientations: Self, Sex, and Subterfuge in Fiction</td>
<td>English 164</td>
<td>5 units</td>
<td>Aut (Tallent)</td>
<td></td>
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<tr>
<td>172</td>
<td>Sex, Body, and Gender in Medieval Religion</td>
<td>Religious Studies 172</td>
<td>4 units</td>
<td>Win (Greenleaf)</td>
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<tr>
<td>173B</td>
<td>U.S. Women's History, 1820-1980</td>
<td>History 173B</td>
<td>5 units</td>
<td>Spr (Horn)</td>
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<tr>
<td>174</td>
<td>African American Psychology</td>
<td>Psychology 174</td>
<td>3-4 units</td>
<td>Aut (McCants)</td>
<td></td>
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<tr>
<td>177</td>
<td>Philosophical Issues Concerning Race and Racism</td>
<td>Philosophy 177</td>
<td>4 units</td>
<td>Spr (Satz)</td>
<td></td>
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<tr>
<td>187</td>
<td>Seminar: Sylvia Plath and Ted Hughes</td>
<td>English 187</td>
<td>5 units</td>
<td>Spr (D. Middlebrook)</td>
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<tr>
<td>189Q</td>
<td>Stanford Introductory Seminar: Mapping and Wrapping</td>
<td>Drama 189Q</td>
<td>3 units</td>
<td>Spr (Eddelman)</td>
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<tr>
<td>192E</td>
<td>Images of Women in French Cinema: 1930-1990</td>
<td>French and Italian 192E</td>
<td>3-5 units</td>
<td>Spr (Apostolides)</td>
<td></td>
</tr>
<tr>
<td>194</td>
<td>Women in Film and Films by Women: A Different Gaze?</td>
<td>Spanish and Portuguese 194</td>
<td>3-5 units</td>
<td>Aut (Haro)</td>
<td></td>
</tr>
<tr>
<td>210</td>
<td>Women Writers of Early Modern Europe</td>
<td>Comparative Literature 210</td>
<td>4-5 units</td>
<td>Spr (L. Middlebrook)</td>
<td></td>
</tr>
<tr>
<td>211</td>
<td>Undergraduate Colloquium: Body, Gender, and Society in Medieval Europe</td>
<td>History 211</td>
<td>5 units</td>
<td>Spr (Buc)</td>
<td></td>
</tr>
<tr>
<td>214A</td>
<td>Medieval Women</td>
<td>German Studies 134P</td>
<td>4 units</td>
<td>Win (Poor)</td>
<td></td>
</tr>
</tbody>
</table>
217. Undergraduate Colloquium: Men, Women, and Power In Early Modern Russia, 1500-1800—(Enroll in History 217.)
5 units, Spr (Kollman)

225D. Undergraduate Colloquium: East European Women and War in the 20th Century—(Enroll in History 225D.)
5 units, Win (Jolluck)

232A. Undergraduate Colloquium: Shopping—A History—(Enroll in History 232A.)
5 units, Aut (M. L. Roberts)

5 units, Spr (Krieger)

265A/365A. Undergraduate/Graduate Colloquium: The History of Sexuality in the United States—(Enroll in History 265A/365A.)
4-5 units, Spr (Freedman)

380E. Critical Concepts in Chicana/o Culture
3-5 units, Spr (Yarbro-Bejarano)

387R. Women and Organizations
4 units, Spr (Martin)

AFFILIATED DEPARTMENTAL LISTINGS
These courses also count toward the Feminist Studies major and minor.

COMPARATIVE STUDIES IN RACE AND ETHNICITY
103. Native American Women
5 units (Bomberry)

CULTURAL AND SOCIAL ANTHROPOLOGY
72. Dance and Culture in Latin America
3-4 units, Spr (Cashion)

83A. Korean American Diaspora
5 units, Aut (Lee)

87A. Human Rights: Anthropological Perspectives
5 units, Spr (Davis)

88A. Race and Ethnicity in Mexico
5 units, Spr (Vaughn)

134A. The Anthropology of Development
5 units, Spr (DeHart de Galicia, Sharma)

DRAMA
163. Performance and America
5 units, Aut (Elam)

158P. Gender and Performance: Performance and Performativity
4 units, Spr (Phelan)

EDUCATION
201. History of Education in the United States
3-5 units, Aut (Williamson)

ENGLISH
126. 20th-Century American Fictions
5 units, Win (Saldivar)

276A. Jane Austen—(Enroll in English 276A.)
4-5 units, Aut (Alfano)

HEALTH RESEARCH AND POLICY
85Q. Stanford Introductory Seminar: Current Issues in Women’s Health
3 units, Win (Kelsey)

HISTORY
13S. Sources and Methods Seminar: Representations of Chinese Women
5 units, Win (Fei)

45S. Sources and Methods Seminar: First Americans—Indian Identities in the American West (1865-Present)
5 units, Spr (Warren)

4 units, Spr (Jackson)

250. Undergraduate Colloquium: American Popular Culture
5 units, Win (M. Thompson)

255A. Undergraduate Colloquium: Culture and Ideologies of Race
5 units, Aut (M. Thompson)

281. The Family in Latin America
5 units, Win (Frank)

HUMAN BIOLOGY
123. Sexuality in Adolescence
3 units, Spr (Brown)

LAW
307. Gender, Law, and Public Policy—(For graduate students.)
3 term units (Rhode)

MEDICINE
237. Women and Health
1-2 units, Aut (Grudzen, Massion)

PHILOSOPHY
193J. Feminist Bioethics
5 units, Spr (Jaworska)

POLITICAL SCIENCE
174M. Seminar: The American Dream
5 units, Spr (Manley)

184W. Issues of Representation in American Politics
5 units, Win (Wong)

RELIGIOUS STUDIES
4N. Stanford Introductory Seminar: The Creation of Woman—Eve, Pandora, and their Interpreters
3 units, Win (Fonrobert)

112. Woman and Islam: Evolving Identites in a Changing World
4 units, Aut (Armijo-Hussein)

163. Religion and Ethnicity/Race
5 units, Win (Busto)

234. The Virgin Mary and Images of Power
5 units, Win (Gelber)

SOCIOLOGY
150. The Family
5 units, Spr (Kuijers)
OVERSEAS STUDIES

The following courses are approved for the Feminist Studies major and taught overseas at the campus indicated. Students are encouraged to discuss with their major advisers on campus which courses would best meet individual educational needs. Descriptions can be found in the “Overseas Studies” section of this bulletin or in the Overseas Studies Program office, 126 Sweet Hall.

BERLIN

134R. Gender and Cultural Discourses in Modern German Literature
4 units, Spr (Hörnigk)

FLORENCE

119. Gender and Power in Ancient Rome
units to be announced, Win (Stephens)

PARIS

167X. Gender Development and Women’s Human Rights
units to be announced, Aut (Okin)

SANTIAGO

111. Social Heterogeneity in Latin America
5 units, Aut (Valdés)

FILM STUDIES

Stanford does not offer an undergraduate major in Film Studies, but a number of courses are offered in various departments. A professional A.M. curriculum in Documentary Film and Video Production is offered by the Department of Communication.

COURSES

ART AND ART HISTORY

4. Introduction to Film Study
4 units, Win (Bukatman)

160/360. Cinema and the City
4 units, Spr (Bukatman)

263. Undergraduate Seminar: Film Theory and Formal Analysis
4 units, Spr (Bukatman)

DRAMA

17N. Stanford Introductory Seminar: (Re)Viewing Valdez in the Year 2000
3 units, Win (Moraga)

65. American Musical Theater: Broadway/Hollywood
4 units, Aut (Eddelman)

ENGLISH

60K. Gender and American Cinema, 1930-1950: The Woman’s Film and Film Noir
3 units, Aut (Ngai)

FRENCH AND ITALIAN

20B. French Cinema
2 units, Win (Staff)

180E. Aspects of Contemporary French Society through Films
4 units, Aut (Bertrand)

192E. Images of Women in French Cinema: 1930-1990
3-5 units, Spr (Apostolides)

OVERSEAS STUDIES

BERLIN

128B. Sissi Sits, Lola Runs: Gender Moves in German Movies
5 units, Aut (Kramer)

FLORENCE

52. Realism, Utopia, Myth, and Society in Italian Cinema: Bernardo Bertolucci, Pier Paolo Pasolini, and Federico Fellini
5 units, Win (Campani)

134F. Modernist Italian Cinema
4 units, Aut (Campani)

SLAVIC LANGUAGES AND LITERATURES

133A/233A. Deviating from Dogma: Film in East Europe from 1956 to 1968
4 units, Spr (Bulgakowa)

SPANISH AND PORTUGUESE

192. Contemporary Spanish Cinema II: The New Generation of Film-Makers
3-5 units, Win (Haro)

194. Women in Film and Films by Women: A Different Gaze?
3-5 units, Aut (Haro)

256. One Hundred Years of Moving Images from Latin America
3-5 units, Aut (Ruffinelli)

FINANCIAL MATHEMATICS

Director: George Papanicolaou
Core Faculty:
Business: D. Duffie, J. M. Harrison, K. Singleton
Economics: T. Amemiya, M. Kurz, P. Wolak
Electrical Engineering: T. Cover
Management, Science and Engineering: P. Glynn, D. Iglehart (emeritus), D. Luenberger
Mathematics: A. Dembo, P. Diaconis, G. Papanicolaou
Steering Committee:

This is an interdisciplinary program that aims to provide a master’s level education in applied and computational mathematics, statistics, and financial applications to individuals with strong mathematical skills.

The departments of Mathematics and Statistics, in close cooperation with the departments of Economics, and Management, Science and Engineering, as well as the Graduate School of Business, provide many of the basic courses.

GRADUATE PROGRAMS

MASTER OF SCIENCE

The program requires that the student take 36 units of work, or twelve courses of 3 units each, from the list of offerings provided below. Ordinarily, three or four quarters are needed to complete all requirements.

Admission—To be eligible for admission, students are expected to have taken the following courses or their equivalent:
1. Linear algebra at the level of Mathematics 103.
2. Advanced calculus (Real Analysis) at the level of Mathematics 115.


5. Computer programming at the level of Computer Science 106A.

Some of these courses, for example, Statistics 217-218, are offered as summer courses and can be taken by candidates lacking the required background. Additional information about summer courses is posted on the program web site; see http://cartan.stanford.edu/finmath.

Candidates for admission must take the general Graduate Record Examination and preferably the subject test in Mathematics. Information about this exam can be found in http://www.gre.org.

Requirements—For the M.S. degree in Financial Mathematics, students must fulfill the following six required courses:

1. In stochastic processes and statistics:
   a) Mathematics 236 (Introduction to Stochastic Differential Equations)
   b) Statistics 240 (Statistical Methods in Finance) or Economics 275 (Time Series).

2. In differential equations, simulation, and computing:
   a) Mathematics 220B (Applied Partial Differential Equations B)
   b) Mathematics 240 (cross-listed with Statistics 245) (Computation and Simulation in Finance)

3. In finance and economics:
   a) Mathematics 180 (Introduction to Financial Mathematics) or Management, Science and Engineering 242, (Investment Science) or Business F620 (Introduction to Financial Economics)
   b) Mathematics 241 (cross-listed with Statistics 250 and Economics 289) (Mathematical Finance)

These courses must be taken for letter grades where available, and an overall 2.75 grade point average (GPA) is required. There is no thesis requirement.

Courses that are equivalent to the above and have been taken previously may be waived by the adviser, in which case they must be replaced by elective courses in the same subject area.

In addition, students must take at least six approved elective courses from a list that can be found on the web site; see http://cartan.stanford.edu/finmath.

The requirements must be met within three years of entering the program.

COURSES

The following are required core courses.

MATHEMATICS


241. Mathematical Finance—(Enroll in Statistics 250.)

STATISTICS


245. Computation and Simulation in Finance—(Enroll in Mathematics 240.)


FRENCH AND ITALIAN

Emeriti: (Professors) Marc Bertrand, Robert G. Cohn, John Freccero, Raymond D. Giraud, René Girard, Ralph M. Hester, Alphonse Jullian, Pauline Newman-Gordon, Roberto B. Sangiorgi, Leo Weinstein

Chair: Jeffrey T. Schnapp

Vice Chair: Robert Harrison

Director of Graduate Studies: Brigitte Cazelles

Director of Undergraduate Studies: Joshua Landy (French), Carolyn Springer (Italian)

Professors: Jean-Marie Apostolidès, Brigitte Cazelles, Jean-Pierre Duquay, Hans U. Gumbrecht, Robert Harrison, Valentín Y. Mudimbe, Jeffrey T. Schnapp, Michel Serres

Associate Professors: Elisabeth Mudimbe-Boyi, Carolyn Springer

Assistant Professors: Joshua Landy, Derek Schilling

Courtesy Professor: Paula Findlen

Courtesy Associate Professor: Michael Marrinan, Mary L. Roberts

Senior Lecturers: Maria Devine, Nele Langmuir, Annamaria Napoli

Senior Lecturers: Maria Devine, Nele Langmuir, Annamaria Napoli

Assistant Professor: Paolo Berdini

Consulting Professor: Jean-Christophe Cavallin

Visiting Assistant Professors: Juliet Flower MacCannell

FRENCH SECTION

The French Section provides students with the opportunity to pursue course work at all levels in French language, literature, cultural and intellectual history, theory, film, and Francophone studies. It understands the domain of "French Studies" in the broadest possible sense: as encompassing the complex of cultural, political, social, scientific, commercial, and intellectual phenomena associated with French-speaking parts of the world, from France and Belgium to Canada, Africa, and the Caribbean.
Three degree programs are available in French: an A.B. (with two concentrations, one literary, the other interdisciplinary), a terminal A.M., and a Ph.D. (with various possible minors and combined degrees).

A curator for Romance Languages oversees the extensive French collection at Green Library. The Hoover Institute on War, Revolution, and Peace also includes a wealth of materials on 20th-century France and on French social and political movements.

A distinguished group of visiting faculty and instructors contribute regularly to the life of the French Section. The section maintains frequent contacts with the Ecole Normale Superieure, the Institut d’Etudes Politiques, the Ecole Polytechnique, and other prestigious institutions.

The French Language IHUM Option—Freshmen with advanced language proficiency in French (proven either by means of a 4-5 on the AP exam or via an interview once on campus) have the option of enrolling in a special discussion section of the department’s Great Works Introduction to the Humanities (IHUM) track. Participation in this track, in which all work is carried out in the French language, entitles them to 5 units towards a French major or minor, as well as counting towards the Writing in the Major (WIM) requirement.

Institute of French Studies—The Stanford Interdisciplinary Institute of French Studies collaborates with other schools and departments in bringing to Stanford French-speaking scholars who teach, or give lectures or seminars in various University centers and programs. The Institute offers courses and discussion sections in French in the context of a concerned discipline, for example, engineering, business, and so on.

The Institute facilitates internships in France for students with appropriate competency in French and with some commitment to furthering their familiarity with French culture, particularly in the realms of research, technology, and industry. The Institute is the only agency in the United States authorized by the French National Ministry of Education to administer tests leading to a high-level proficiency certificate in technical and scientific French. These tests are given in the Autumn and Spring quarters.

Stanford in Paris—The Stanford Overseas Program in Paris offers undergraduates the opportunity to study in France during the Autumn and Winter quarters. It provides a wide range of academic options, including coursework at the Stanford center and at the University of Paris, independent study projects, and internships. In addition, the program promotes a high degree of interaction with the local community through volunteer employment, homestays, and internships. The minimum language requirement for admission into Stanford in Paris is one year of French at the college level.

Courses offered in Paris may count toward fulfillment of the requirements of the French major or minor. Specialized offerings at the Stanford home campus and in Paris encourage engineering students to study abroad and to coordinate internships through the department to work in France. All students are encouraged to consult with the Director of Undergraduate Studies before attending the program, and after returning, in order to ensure that course work and skills acquired abroad can be coordinated appropriately with their degree program. Detailed information, including program requirements and curricular offerings, may be obtained from the “Overseas Studies” section of this bulletin, the Stanford in Paris website http://www-osp.stanford.edu/Paris/, or the Overseas Studies Office in Sweet Hall.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The French Section offers a two-track major in French and a minor. Each of these programs encourages students to pursue a course of study tailored to their individual needs and interests. The purpose of an undergraduate degree in French is necessarily variable. For some students, such a degree may serve as a stepping stone to entering the domains of international business or law; for others, it may provide training for a career as a translator or teacher; for others still, it may serve as preparation for graduate studies in French, History, or Comparative Literature. This variability argues for the sort of flexibility that characterizes the French major.

Two principal tracks are available. The first consists of a “French Literature concentration.” It corresponds to a traditional French major, with the bulk of course work done within the French Section and devoted to advanced language training and to the study of French literature, culture, and civilization. The second track consists of a “French Studies concentration” and is intended as a non-traditional, interdisciplinary alternative to the first concentration. It allows students to combine work in French with studies in fields such as African studies, art history, economics, history, international relations, music, and political science, or in other foreign languages and literatures.

Students who complete the department’s two-quarter Great Works IHUM sequence (see above) are automatically credited with 5 units towards the French major or minor. Students enrolled in the French language discussion section of the Great Works IHUM sequence receive, in addition to these 5 units, 6 units which count towards fulfillment of the Writing in the Major requirement.

Prerequisites—Before declaring a French major, a student must be proficient in written and spoken French at a second-year college level. Such proficiency must be demonstrated either (1) by having completed the entire language sequence up to and including French 23, (2) by having scored a 5 or better on either the French language or the French literature Advanced Placement (AP) exams, or (3) by having demonstrated equivalent proficiency on the departmental placement exam offered at the beginning of each academic quarter. Students not meeting at least one of these criteria are required to complete such portion of the language sequence as deemed necessary by the department before beginning to take courses toward the major.

Declaring a Major—Before declaring, the prospective major is required to schedule an appointment with the Director of Undergraduate Studies. This informal meeting is designed to introduce the student to the department and to answer any questions that the student may have regarding the various options that are available.

After this meeting, the student is asked to draft a brief statement of purpose (one-to-two pages) describing his or her intellectual goals and interests within the discipline, and his or her intentions as regards the different concentrations. This statement is a nonbinding draft meant to encourage each student to carefully consider his or her course plans, with an eye towards the Senior Project (see below) or honors thesis.

Majors are formally accepted into the department upon review of the statement and of their language competency. Once accepted, a student should declare the French major with the Registrar’s Office and arrange for the academic file to be delivered to the Director of Undergraduate Studies.

REQUIREMENTS

Irrespective of the concentration chosen, the French major requires a minimum of 56 units, to be selected in accordance with the following requirements:

1. Introductory Series on French and Francophone Literature and Culture (12 units): three courses must be taken from the French 130, 131, and 132 sequence.

2. Advanced Language (4 units): French 261 (prerequisite: 123, 124, or consent of instructor), Overseas Studies 126P, or participation in the French language discussion section in the IHUM Great Works track are required. Either course fulfills the Writing in the Major (WIM) requirement.

3. Research Seminar (3 units): a majors-only seminar, French 289, must be taken in the Autumn Quarter of the senior year. This course prepares and assists students as they undertake either their Senior Project (see below) or honors thesis. It also familiarizes them with research resources in the department and University and helps students think critically about their research topics. By the end of the course, students must have chosen either a project adviser or a thesis adviser, generally a faculty member in the department, who offers support and feedback throughout the development of the Senior Project or honors thesis.
Senior Project—In order to demonstrate the quality of his or her scholarly work and command of written French, each major not writing an honors thesis (see “Honors Program” below) is required to submit a senior project to the project adviser before May 15 of the senior year. The project consists of a research paper with a target length of 20 pages and must be written in French.

The senior project is not graded and no credit is offered for it. However, acceptance of the senior project by the project adviser is a condition for graduation from the department. A paper deemed unsatisfactory by the project adviser is returned to the student for rework and resubmission by an agreed-upon date.

Students are advised to begin thinking about their senior projects as early as their junior year, even if they are in Paris. While in Paris, students should avail themselves of the unique resources the city has to offer for research on their chosen topic.

THE TWO CONCENTRATIONS (36 units minimum each)

All majors, whether or not they are applying for honors, must choose one of the following two concentrations in structuring their course of study.

FRENCH LITERATURE

This concentration is appropriate for students whose interests are such that most of their course work towards the major is done within the French Section. In addition to the required courses listed above, they must enroll in at least nine additional courses. Of these nine, four must fulfill the Ancien Régime requirement detailed below.

1. Ancien Régime Courses (approx. 16 units): at least four courses must concern the period before July 1789. Courses fulfilling this requirement within the department must be drawn from above the 190 level. Courses chosen from outside the department must be preapproved by the Director of Undergraduate Studies.

2. Remaining Courses (approx. 20 units): the student is encouraged to use the remaining five or more courses to develop a specialized knowledge of a specific domain related to either the Senior Project or the honors thesis.

FRENCH STUDIES

The department also accommodates students who would like to combine their interest in French with the study of other disciplines or literatures. In the past, students have completed majors in French and African Studies, French and Economics, French and English, French and European Studies, French and German, French and Italian, and French and Linguistics. Students who wish to elect the French Studies concentration are required to draw up a proposal for a rigorous and coherent course of study (consisting of a paragraph-long description of the field of concentration and a course plan) and present it to the Director of Undergraduate Studies.

Requirements for the minor include one advanced language course (to be chosen from 122, 123, 124, 125, and 261); three of the introductory series on French and Francophone literature and culture (130, 131, 132, 133); and a minimum of two additional courses in language or literature numbered 126 and above. Of these, only one may be taught in English (courses in the ‘E’ series). All courses must be chosen in consultation with the Director of Undergraduate Studies who is responsible for evaluating all study plans for the minor.

EXTENDED MAJORS

Requirements for both extended majors are essentially identical to those of the French major with a concentration in French literature.

French and English Literatures—In addition to the requirements for the A.B. in French, candidates complete four English literature courses numbered 100 and above related to their French program.

French and Italian Literatures—In addition to the requirements for the A.B. in French, students complete four Italian courses numbered 200 and above related to their concentration in French.

MINORS

Students considering a minor in French are encouraged to design a course of studies that fosters their understanding of the interaction between French and their major field of specialization. A minimum of 24 units of undergraduate work beyond the French 23 level must be completed.

Requirements for the minor include one advanced language course (to be chosen from 122, 123, 124, 125, and 261); three of the introductory series on French and Francophone literature and culture (130, 131, 132, 133); and a minimum of two additional courses in language or literature numbered 126 and above. Of these, only one may be taught in English (courses in the ‘E’ series). All courses must be chosen in consultation with the Director of Undergraduate Studies who is responsible for evaluating all study plans for the minor.

CROSS-DISCIPLINARY STUDIES

FRENCH AND ENGINEERING

Engineering majors may elect to include their program from four to six specially designed courses in French. The actual number of courses is dependent on competency in French and is determined in consultation with an adviser. Courses in engineering taken at French institutions during a student’s attendance at the Stanford Paris Program, as well as internships in French firms may count as part of this extended major. Admission to engineering courses in Paris requires an advanced proficiency level, to be determined with a department adviser. Engineering majors successfully completing a major in French are also eligible for a Certificate of Advanced Proficiency in French upon their passing an official proficiency test for technological and scientific French sanctioned by the French government. This certificate, which is noted on the official transcript, is widely accepted in French-speaking countries of the European Union and in most Francophone countries throughout the world as guaranteeing the certificate holder’s high-level competency in French. Engineering students wishing to extend their major to include French and to include Paris Program courses and internships in France must consult closely with advisers in Engineering, French, and Overseas Studies.

The program includes the following courses given in French specially designed for students in technology and science:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>126. Technological and Scientific French</td>
<td>3-5</td>
</tr>
<tr>
<td>127. French Media and Communications</td>
<td>3-4</td>
</tr>
<tr>
<td>128. Technocritle</td>
<td>3-5</td>
</tr>
<tr>
<td>129. Advances of Technology in Europe</td>
<td>3-5</td>
</tr>
</tbody>
</table>

Four courses in Engineering have discussion sections in French (see below under Advanced Language):

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>40. Introductory Electronics</td>
<td>1-3</td>
</tr>
<tr>
<td>50. Introductory Science of Materials</td>
<td>1-3</td>
</tr>
<tr>
<td>50. Introductory Science of Materials</td>
<td>1-3</td>
</tr>
<tr>
<td>106. Programming</td>
<td>1-3</td>
</tr>
</tbody>
</table>

The School of Engineering, the Department of French and Italian, and the Stanford Overseas Studies Office have information on engineering courses offered through the Stanford Center in Paris by affiliated French institutions (Ecole Polytechnique, Ecole des Mines, Conservatoire National des Arts et Metiers).

FRENCH AND LINGUISTICS

Linguistics majors may elect to specialize in the French language. In addition to 50 units in Linguistics, of which two courses (110 and 160) may be replaced by comparable courses in French, students opting for a
French Language Specialization must take three courses in the introductory series devoted to French and Francophone literature and culture (130-133). For full details, contact the Department of Linguistics.

HONORS PROGRAM

Majors are eligible to apply to the honors program if they have maintained an average grade point average (GPA) of 3.5 in five upper-division French courses. The honors program candidate must fulfill all regular requirements for the major, save the Senior Project, from which he or she is exempt. Instead, the student undertakes the writing of a research paper no shorter than fifty pages in length, written in French, on a specialized topic. No later than the end of the Spring Quarter of the junior year, preferably after completion of the research seminar, the student must submit to the Director of Undergraduate Studies an "Application for Honors in French," the central portion of which must contain an outline of the proposed honors essay. If it is in need of revisions, the Director of Undergraduate Studies helps the student through the revision process until the proposal is granted his or her approval. (The Director of Undergraduate Studies also helps the student identify an appropriate adviser for the essay.) Once the application is approved, the student may receive 9 to 12 units of credit for independent work on the honors essay by enrolling in French 198. All honors essays are due to the thesis adviser no later than 5:00 p.m. on May 15 of the terminal year. If an essay is found deserving of grade of 'A-' or 'A' by the thesis adviser, honors are granted at the time of graduation.

Honors College—The Department of French and Italian encourages all honors students to enroll in the honors college run by the Division of Literatures, Cultures, and Languages. The college meets at the end of every summer, during the weeks directly preceding the start of the academic year, and is designed to help students develop their honors thesis projects. Applications must be submitted by the Spring Quarter of the same calendar year. For more information, contact the department administrator.

LA MAISON FRANCAISE

La Maison Française, 610 Mayfield, is an undergraduate residence that serves as a campus French cultural center, hosting in-house seminars as well as social events, film series, readings, and lectures by distinguished representatives of French and Francophone intellectual, artistic, and political life.

GRADUATE PROGRAMS

Admission to the A.M. and Ph.D. Programs—Applications and admissions information may be obtained from Graduate Admissions in the Registrar's Office. Applicants should read carefully the general regulations governing degrees in the "Graduate Degrees" section of this bulletin. They should have preparation equivalent to an undergraduate major in French and should also have reached a high level of speaking and writing proficiency in French. Previous study of a language other than French is also highly desirable. Recent Graduate Record Examination (GRE) results are required, as is a writing sample representative of the applicant's best undergraduate work.

MASTER OF ARTS

(Terminal Program)

The terminal A.M. in French provides a flexible combination of language, literature, cultural history, and methodology course work designed to enhance the preparation of secondary school, junior college, or college teachers.

Candidates must complete a minimum of 36 units of graduate work with a grade point average (GPA) of 'B+,' as well as pass the master's examination at the end of their training. To fulfill the requirements in a single year, enrollment must be for an average of 12 units per quarter.

Applications for admission to the Masters of Arts program must be received by May 31 of the prior year. Candidates for this degree are not eligible for financial aid or for teaching assistantships.

REQUIREMENTS

The basic program of 36 units requires the following course work:

1. One teaching methodology course, ordinarily "The Learning and Teaching of Second Languages," the second-language-pedagogy course offered by the Stanford Language Center.
2. A cultural history course (to be taken either inside or outside the Department of French and Italian).
3. A course in stylistics and textual analysis (261 or equivalent).
4. All remaining units are to be taken in advanced literature courses (200 level or above), three of which must be concerned with the pre-revolutionary period of French cultural history.

The Stylistics and Textual Analysis (261) requirement is designed to insure that A.M. students have achieved a high level of proficiency in written and oral expository French and a familiarity with various modes of literary-critical writing. Master's students who have already achieved a high degree of competence in writing in French (either at Stanford or elsewhere) may, with the approval of the Director of Graduate Studies, be exempted from this requirement upon presentation of a sample seminar paper in the quarter prior to that during which 261 would otherwise be taken.

EXAMINATION

The terminal A.M. examination is normally administered two weeks before the end of the Spring Quarter by the three members of the examination committee, selected each year by the Director of Graduate Studies. It consists of two parts:

1. The written exam (two hours) tests the candidate's general knowledge of French literature and is based on the same reading list as that for the Ph.D. qualifying exam (see below).

2. The oral exam (90 minutes) assumes as its point of departure the student's answers on the written exam. It examines the candidate's knowledge and understanding of French literary history on the basis of the standard reading list. At least one question must be answered in French and two in English. Use of a dictionary is allowed.

If the student's performance on the exam is deemed a "pass" by two out of three of the members of the examining committee, the student is then permitted to go on to the oral examination (which is ordinarily taken later in the same week).

Should the candidate fail the A.M. written exam, he/she is given a second chance at the end of the Spring Quarter.

2. The oral exam (90 minutes) assumes as its point of departure the student's answers on the written exam. It examines the candidate's knowledge and understanding of French literary history on the basis of the standard reading list.

At the conclusion of the oral exam, the examination committee meets in closed session and discusses the student's performance on the written and the oral portions of the examination. If it is judged adequate, the A.M. degree is granted. In no event may the master's written and oral exams be taken more than twice.

DOCTOR OF PHILOSOPHY

The Department of French and Italian provides students with the opportunity to pursue advanced work in French language, literature, cultural history, theory, and Francophone studies within a uniquely flexible interdisciplinary framework. Unlike conventional Ph.D. programs, it encourages students to construct a highly individualized course of study, integrating specialization in a particular literary period or area with work in such fields as art history, classics, film studies, the history of science and technology, linguistics, literary theory, music, and philosophy. The program is founded on the belief that such a balance between period/area specialization and interdisciplinary breadth is not only desirable but essential in a field such as French Studies. Students in the Ph.D. program are normally admitted as French Fellows on a four to five year fellowship plan that integrates their financial support with rigorous training as scholars and as prospective university faculty.
Students admitted to the program work closely with the Director of Graduate Studies in structuring a plan consistent with their needs and interests. Aside from the benefits of the program’s flexible structure, a number of unique resources are available to students. The French Section’s exchange program with the Ecole Normale Supérieure provides candidates (selected on a competitive basis) with the opportunity to pursue dissertation research in Paris.

ADVISING

Given the interdisciplinary nature of the Ph.D. program in French and the opportunity it affords each student to create an individualized program of study, regular consultation with an adviser is of the utmost importance. The adviser for all entering graduate students is the Director of Graduate Studies, whose responsibility it is to assist students with their course planning and to keep a running check on progress in completing the course, teaching, and language requirements. By the end of the first year of study, each student must choose a faculty adviser whose expertise is appropriate to his or her own area of research and interests.

Entering graduate students are also paired with a faculty mentor as a function of their stated research interests at the time of admission. The role of the mentor is to advise the student on an informal basis regarding the student’s academic program and plans.

REQUIREMENTS

A candidate for the Ph.D. degree in French must complete at least 72 units of graduate-level study beyond the bachelor’s degree and teach five language courses in the section.

Students entering with a master’s degree or previous graduate work may receive credit as determined on a case-by-case basis, up to a maximum of 36 units. Fellowship funding and teaching requirements are adjusted according to University regulations.

REQUIRED/RECOMMENDED COURSES

Three courses are required:

1. The Disciplines of Literature (French and Italian 369E), a 5-unit seminar offered in the Autumn Quarter of each year, designed to acquaint students with the theoretical and methodological concerns of literary study. This course must be taken in the first quarter of study.

2. Definition and Inquiry: Colloquium on Research Methods in French and Italian (French and Italian 101B), a 3-unit course designed to familiarize graduate students with research materials and techniques. This course must be taken no later than the end of the third year of study.

3. The Learning and Teaching of Second Languages, the second-language-pedagogy course offered by the Stanford Language Center in the Spring Quarter of each year in order to prepare entering graduate students for teaching in their second year.

In addition to the above-required courses, native English speaking students are encouraged to enroll in Stylistics and Textual Analysis (French 261).

Distribution of Elective Courses—Apart from these requirements, students are granted considerable freedom in structuring a course of study appropriate to their individual needs. Of the 72 minimum units of graduate course work required for the Ph.D., at least 52 units must be taken within the Department of French and Italian.

Language Requirements—Attaining a native or near-native fluency in French is the individual responsibility of all candidates in the Ph.D. program, and remedial course work needed to achieve such fluency cannot count towards the Ph.D. degree. In addition, candidates are required to achieve a high level of proficiency in one additional foreign language, with the language in question to be determined by the student and his or her adviser as a function of the student’s area of specialization. Such proficiency may be demonstrated either by successfully completing a third-year level or above undergraduate course or, better, a graduate seminar in the language in question; or by passing an exam that establishes a third-year or above level of competence in writing, reading, and speaking. (In no case is passage of a standard “reading” competence exam considered sufficient.) In the case of ancient Greek and Latin, “a high level of proficiency” means a level superior to a second year collegiate level of proficiency in reading and writing.

The second foreign language requirement should be completed as soon as possible, but in any case not later than the end of the third year for students who entered the program without an A.M., and not later than the end of the second year for students who entered the program with an A.M. Completion of the language requirements is a prerequisite for taking the University Oral Examination.

EXAMINATIONS

There are three examinations: the 90-minute qualifying exam, the special topic exam, and the University oral examination.

Qualifying Examination—The first oral examination, which normally takes place at the end of Spring Quarter of the first year of study, tests the student’s knowledge of the French language and of French literature. The student is responsible for scheduling the exam one month in advance. The date and time chosen must be determined in consultation with the examining committee (see below).

The exam is based on a standard reading list covering major works from all periods of French literature, from the Middle Ages to the contemporary scene. The list may be expanded to reflect a student’s particular interests, but not abridged.

Half of the exam takes place in English, half in French (with the student free to choose which portion transpires in which language). The exam consists of two parts:

1. A 20-minute presentation by the candidate on a topic to be determined by the student. This presentation may be given either in English or in French and should engage, in a succinct and synthetic manner, an issue or set of issues of broad relevance to French literary history about which the student has been thinking as he or she has been preparing the exam. The presentation must not simply be a text read aloud, but rather must be given from notes. It is meant to be suggestive and not exhaustive, so as to provoke further discussion.

2. A 70-minute question-and-answer period in which the examining committee follows up on the candidate’s presentation and discusses the reading list with the student. At least part of this portion of the exam takes place in French. The student is expected to demonstrate a solid knowledge of the texts on the reading list and of the basic issues which they raise, as well as a broader sense of the cultural/literary contexts into which they fit.

The examining committee consists of two faculty members selected by the student, as well as the Director of Graduate Studies.

Two weeks before the exam, the student must also submit a graduate seminar paper which he or she considers representative of the quality of his or her graduate work at Stanford.

On the basis of this paper, the results of the qualifying examination, and an evaluation of the student’s overall progress, the members of the student’s examining committee will vote for or against admission to candidacy for the Ph.D. The terminal master’s degree may be awarded to students who have completed the qualifying procedure, but whose work is judged insufficient for admission to candidacy for the Ph.D. If the overall case for or against promotion to candidacy is deemed uncertain, students may be asked either to retake the qualifying exam, to submit a new paper, or they may be admitted to candidacy on a probationary basis. Subject to approval by the Director of Graduate Studies and department Chair, students already holding an advanced degree in French Studies, when admitted to the French Ph.D. program, may be excused from the qualifying exam. However, they must present a formal request for a waiver to the Director of Graduate Studies upon their arrival at Stanford. Such a request must document the course work completed elsewhere and include all relevant reading lists. Only in cases where taking the qualifying exam would involve considerable repetition of already completed work is such a waiver likely to be granted.

Special Topic Examination—The second oral examination, which normally takes place at the end of Spring Quarter of the second year of study, concerns a topic (a particular literary genre or a broad theoretical, historical, or interdisciplinary question) freely chosen and developed by the individual student working in collaboration with his or her adviser.
and the Director of Graduate Studies. Students should design this research project so that it has the breadth and focus of a book they might write or a seminar they might teach. The proposed topic should be discussed with the Director of Graduate Studies before the end of the quarter preceding the quarter in which they plan to take the exam. The student and the Director of Graduate Studies choose a committee of two faculty members with interests close to the proposed topic. (In most cases, one of these committee members is the student’s adviser.) In addition to these two members, the examination committee includes the Director of Graduate Studies, who serves in an ex officio capacity as the third member of the examination committee.

At the beginning of the quarter in which he or she takes this examination, the student discusses research plans with committee members, who offer suggestions on the project and on the reading list. In general, the reading list should be between one and two single-spaced pages in length. In the course of the quarter, the student should regularly consult with committee members to discuss his or her progress. The actual examination lasts one hour. The candidate must present a tentative reading list to the members of the committee about twelve weeks before the examination and a final reading list at least one week before the examination. This list, to be headed by a title describing the topic of the examination, may be divided into two parts: “core” works that the student has found to be central to his or her topic, and works that fill out the “periphery” of the topic. Two copies of the final reading list must be given to the Student Services Officer for the Division of Languages, Cultures, and Literatures: one for the student’s file and one for a special file which subsequent students can consult. The examination assumes the form of an oral colloquy between the student and the examining committee. It concentrates on the conclusions to which the student’s research has led him or her, and aims to determine the student’s overall mastery of the research topic in question. At the beginning of the examination, the student presents a talk of no longer than 20 minutes (not to be written out, but to be presented from notes) reviewing the results of his or her reading and outlining the major features and implications of the chosen topic. The remainder of the hour is devoted to a discussion between the student and the committee regarding the problems the student raised in the talk and the reading list itself.

The following procedures are applicable to both the qualifying and special topic exams:

1. The committee meets briefly at the end of the exam and immediately informs the student as to whether he or she has passed the examination.
2. In the week after the examination, the student is expected to meet individually with members of the committee to discuss strengths and weaknesses revealed during the qualifying exam or colloquy.
3. The Director of Graduate Studies places a brief letter describing each one-hour oral exam in the student’s file, a copy of which is also be furnished to the student.

The University Ph.D. examination follows most of the same procedures outlined above. Normally students put one, and at most two, full-time quarters of study into preparation for the exam. The University oral exam should virtually always be taken at the end of Spring Quarter of the third year of study. Students must complete minimum course requirements (as listed in the Stanford Bulletin) and all language and course requirements before the quarter in which they take the University oral examination.

Early in the quarter before they intend to take the University Ph.D. examination, students must discuss the scope and nature of the period to be covered, as well as the dissertation proposal, with the Director of Graduate Studies. The reading list should include works in all genres relevant to the period covered. The amount of “non-literary” or cross-disciplinary material on the reading list varies according to the period and the research interests of the student. Students ordinarily cover about a century of writing in great depth. As with the preceding examinations, the Director of Graduate Studies and the student determine the committee’s makeup.

The governing principle is that the University oral examination in French must be a period examination rather than one on the specific concerns of the dissertation proposal, which is dealt with separately in a later colloquium. It follows from this basic principle that the examination will cover the major authors and genres in the student’s period of choice. The lists may well include critical and scholarly works or texts from outside the traditional domain of French literary studies (such as film, philosophy, other literary traditions), but such coverage should be regarded as supplemental except in rare instances where the chair and faculty advisers agree to define these materials as the student’s “field.”

The aim of the University oral is to establish the student’s credentials as a specialist in the period of his or her choosing, so the core of the reading list must be made up of texts that constitute the cultural baggage essential to any specialist. It follows that reading lists must not focus on the narrow area of the student’s research interests. The tendency to bias reading lists toward the dissertation topic, be it an author or a genre, does not cancel the obligation to cover the major figures and genres. It is understandable that some students, by their third year, have become so deeply committed to their work toward the dissertation that they wish to use the preparation period for the examination as part of their dissertation research. Certainly, some of the exam work will prove relevant, but they should also remember that the examination is the central means of certifying their expertise in a literary period.

The exam committee consists of four members, in addition to a committee chair from outside the Department of French and Italian whose principal functions are to keep track of time and to call on the four members of the committee who question the candidate on the talk and on the reading list. Students are required to discuss the reading list for the examination with the Director of Graduate Studies and with members of their committee during the quarter preceding the examination. A final reading list must be in the hands of the committee and the Student Services Officer for the Division of Languages, Cultures, and Literatures no later than two weeks preceding the examination. Students must submit the Request for University Oral Exam form to the Student Services Officer at least three weeks before the proposed date of the exam. At the same time this form is submitted, students should also submit the Notice of Appointment of the Ph.D. Dissertation Reading Committee. In addition, a Report on Ph.D. Foreign Language must be completed, certifying a reading knowledge of the two foreign languages the student presents to meet the language requirements. The two-hour examination consists of the following two parts:

1. Forty minutes: a 20-minute talk by the candidate followed by a 20-minute question and answer period concerning the talk.
   Working with the committee members, the candidate’s adviser will prepare three or more questions to be presented to the candidate at 8:00 a.m. on the day of the examination. These questions concern broad topics pertinent to the candidate’s reading list and period of specialization, including concerns relevant, but by no means limited to, the student’s projected dissertation. The candidate chooses one of the questions and develops a 20-minute talk in response. Students must not read from a prepared text, but rather must speak from notes. They are free to consult any necessary materials while preparing the talk. The candidate is questioned for 20 minutes on the talk, with the dissertation adviser starting the questioning.
2. One hour, 20 minutes: questions on the area of concentration.
   Each member of the committee, except for the chair, is assigned a 20-minute period to question the candidate on the reading list and its intellectual-historical implications.

The University oral examination is a formal University event. It represents the last occasion for the faculty to evaluate a student’s overall preparation as a candidate for the Ph.D. After the University orals, only the colloquium on the dissertation prospectus and certification of the final dissertation by the student’s reading committee stand in the way of conferred of the Ph.D. The examination, therefore, is a uniquely significant event and is designed to evaluate the student’s preparation as a specialist in a given sector of French studies, but within a broader context than that provided by a single course, examination, or even the dissertation itself.
Dissertation

The doctoral dissertation should demonstrate the ability to carry out research, organize, and present the results in publishable form. The scope of the dissertation should be such that it could be completed in 12 to 18 months of full-time work.

Colloquium on the Dissertation Proposal—The colloquium normally takes place in the quarter following the University oral examination; in most cases this means early in Autumn Quarter of the student’s fourth year of study. The colloquium lasts one hour, begins with a brief introduction to the dissertation prospectus by the student (lasting no more than ten minutes), and consists of a discussion of the prospectus by the student and the three readers of the dissertation. At the end of the hour, the faculty readers vote on the outcome of the colloquium. If the outcome is favorable (by majority vote), the student is free to proceed with work on the dissertation. If the proposal is found to be unsatisfactory (by majority vote), the dissertation readers may ask the student to revise and resubmit the dissertation prospectus and to schedule a second colloquium.

The prospectus must be prepared in close consultation with the dissertation director during the months preceding the colloquium. It must be submitted in its final form to the readers no later than one week before the colloquium. A prospectus should not exceed ten double-spaced pages, in addition to which it should include a working bibliography of primary and secondary sources. It should offer a synthetic overview of the dissertation, describe its methodology and the project’s relation to prior scholarship on the topic, and lay out a complete chapter-by-chapter plan.

It is the student’s responsibility to schedule the colloquium no later than the first half of the quarter subsequent to the quarter in which the student passed the University oral examination. The student should arrange the date and time in consultation with the Student Services Officer and with the three examiners. The Student Services Officer schedules an appropriate room for the colloquium.

Members of the dissertation reading committee ordinarily are drawn from the University oral examination committee, but need not be the same.

Joint Degrees and Minors

A candidate may also take a joint degree in French and Humanities, as described in the “Interdisciplinary Studies in Humanities” section of this bulletin. Minors are possible in Comparative Literature, Italian, Linguistics, Modern Thought and Literature, and other departments offering related courses such as Art and Art History, History, Music, Philosophy, Spanish, and so on.

Students interested in a joint degree or a minor should design their course of study with their advisor(s). Joint degrees and minors usually require 24 additional units. With careful planning, students may complete course work for the Ph.D. and the minor in a total of nine quarters.

Ph.D. Minor in French Literature—The department offers a minor in French Literature. The requirement for a minor in French is successful completion of 24 units of graduate course work in the French Section with a grade point average (GPA) of ‘B’ or above. Interested students should consult the graduate adviser.

Italian Section

The Italian Section offers a variety of graduate and undergraduate programs in Italian language, literature, culture, and intellectual history. Course offerings range from small and highly specialized graduate seminars to general courses open to all students on authors such as Dante, Boccaccio, and Machiavelli.

On the undergraduate level, a number of options are available. In addition to the Italian major, students may choose from a minor in Italian, an honors program in the Humanities (see the “Interdisciplinary Studies in Humanities” section of this bulletin), an honors program in Italian, and two extended majors—one in Italian and French literature and one in Italian and English literature.

On the graduate level, programs of study leading to the A.M. degree and the Ph.D. degree are offered in Italian literature. Joint programs for the Ph.D. degree with the graduate programs in Comparative Literature, Humanities, and Modern Thought and Literature are also available.

Special collections and facilities at Stanford offer the possibility for extensive research in Italian studies and related fields. These include the undergraduate and graduate libraries and the Hoover Institution for the Study of War, Revolution, and Peace. Collections in Green Research Library are especially strong in the Medieval, Renaissance, and contemporary periods; the Italian section is one of the larger constituents of the Western European collection at the Hoover Library; and the Music Library has excellent holdings in Italian opera.

Stanford in Italy—Stanford in Florence affords undergraduates with at least three quarters of Italian the opportunity to take advantage of the unique intellectual and visual resources of the city and to focus on two areas: Renaissance History and Art, and Contemporary Italian and European Studies. The program is structured to help integrate students as fully as possible into Italian culture through homestays, Florence University courses, the Language Partners Program, research, internship and public service opportunities, and by conducting some of the program’s classes completely in Italian. Many of the courses offered in Florence may count toward the fulfillment of requirements for the Italian major or minor. Students are encouraged to consult with the Italian undergraduate adviser before and after a sojourn in Florence to ensure that their course selections meet Italian Section requirements. Information on the Florence program is available in the “Overseas Studies” section of this bulletin, the Stanford in Florence website http://www-osp.stanford.edu/Florence/ , or at the Overseas Studies Office in Sweet Hall.

Undergraduate Programs

Bachelor of Arts

The Italian major offers students the opportunity to develop an in-depth knowledge of Italian literature, language, and civilization through a highly flexible program combining course work in Italian with work in such fields as art history, classics, comparative literature, economics, English, French, history, international relations, music, philosophy, and political science. All Italian majors are required to have completed two second-year language courses: Italian 21, 22, and/or 23 (or the equivalent taken at the Florence campus). Completion of the department’s two-quarter Great Works IHUM sequence (see above) entitles a student to 5 units towards the Italian major or minor. Students considering an Italian major should consult with the Italian undergraduate adviser as early as possible (even before completing the language requirement) in order to ensure a maximum of flexibility in designing a course of study suited to individual needs and cultural interests.

Italian majors must complete 60 units of course work above the 100 level.

The remaining requirements for the major are:
1. A minimum of 32 units of Italian courses (selected from courses numbered 100 and above).
2. Of these courses, at least one on Dante is required, as well as at least one in each of the following areas: (a) the Middle Ages, (b) the early modern period, and (c) the modern period. A Dante course may fulfill the Middle Ages requirement.
3. The intermediate-level survey sequence (Italian 127, 128, 129).
4. One advanced language course beyond the level of Italian 114.

Of the 60 units required for the major, up to 28 units of course work in related fields may be taken outside the department.

Extended Majors

Requirements for both extended majors are essentially identical to those of the Italian major with a concentration in Italian literature.

Italian and English Literatures—In addition to the 32 units required for the A.B. in Italian, candidates must complete four English literature courses numbered 100 and above related to the field of concentration in Italian Studies.

Italian and French Literatures—In addition to the 32 units required for the A.B. in Italian, candidates must complete four French literature
courses numbered 100 and above related to the field of concentration in Italian Studies.

MINORS

Students considering a minor in Italian are encouraged to design a course of studies that fosters their understanding of the interaction between Italian and their second area of expertise. A minimum of 24 units of undergraduate work beyond the Italian 3 level must be completed. Requirements for the minor include two intermediate language courses (chosen from 21, 22, and 23); all three of the introductory series on Italian literature and culture (127, 128, 129); and a minimum of one advanced course in language or literature numbered 114 and above. All courses must be chosen in consultation with the Director of Undergraduate Studies, who is responsible for evaluating all requests and individual study plans for the minor.

HONORS PROGRAMS

ITALIAN

Italian majors with a grade point average (GPA) of ‘B+’ or better in all Italian courses are eligible for department honors. In addition to the requirements listed above, honors candidates must complete an honors essay representing 6 to 9 units of academic work through enrollment in Italian 198. Proposals for essays must be submitted to the Italian faculty by the end of the candidate’s junior year. If the proposal is accepted, a member of the Italian faculty is assigned to serve as the student’s advisor for the essay. Students interested in the honors program should consult the Italian undergraduate adviser early in their junior year.

HUMANITIES

An honors program in the Humanities is available for Italian majors who wish to supplement their studies with a carefully structured program of humanistic studies. See the “Interdisciplinary Studies in Humanities” section of this bulletin for further information.

LA CASA ITALIANA

La Casa Italiana, 562 Mayfield, is an undergraduate residence devoted to developing an awareness of Italian language and culture. It works closely with the Italian Cultural Institute in San Francisco and with other local cultural organizations. It often hosts visiting representatives of Italian intellectual, artistic, and political life. A number of departmental courses are regularly taught at the Casa, which also offers in-house seminars. Assignment is made through the regular undergraduate housing draw.

GRADUATE PROGRAMS

Admission to the Program—Candidates are expected to be proficient in the Italian language and to have done significant course work in Italian literature and/or Italian studies on the undergraduate level. Candidates with a broad humanistic and linguistic background are especially encouraged to apply. Contact Graduate Admissions in the Registrar’s Office for application information. Recent Graduate Record Examination (GRE) results are required.

MASTER OF ARTS

(TERMINAL PROGRAM)

The A.M. in Italian provides a combination of language, literature, civilization, and general courses designed to prepare secondary school, junior college, or college teachers. It is preferred that applicants have undergraduate degrees in Italian or in a related field. Knowledge of a second Romance language is desirable.

Candidates must complete a minimum of 36 units of graduate work, with a GPA of ‘B+,’ and pass a comprehensive oral examination (see “Qualifying Examination” section below for the Ph.D.). To fulfill the requirements in one year, students should enroll for an average of 12 units per quarter.

The basic course program (36 units) is nine graduate courses in Italian, one of which may be in a related field. The option of substituting a master’s thesis for two literature courses is available.

Reading knowledge of a second Romance language is required. French is recommended.

Requirements for the completion of the A.M. include a comprehensive literature and language oral examination, which is given before the end of Spring Quarter or at the beginning of the following Autumn Quarter. Before taking the exam, a candidate for the degree must submit to the Italian faculty a sample graduate seminar paper representative of the quality of his or her graduate work. On the basis of this paper, the results of the comprehensive examination, and the student’s overall progress, members of the department vote for or against awarding of the A.M. degree.

Applications for admission must be received by May 31. Candidates for this degree are not eligible for financial aid or for teaching assistantships.

DOCTOR OF PHILOSOPHY

Stanford’s Ph.D. program in Italian offers the opportunity for advanced work in Italian literature and studies within an unusually flexible interdisciplinary framework. It is fully independent of the Ph.D. program in French and aims to encourage students to bring broader methodological and interdisciplinary concerns to bear on the study of Italian literature. Like conventional Italian Ph.D. programs, it places primary emphasis on developing a command of Italian literature as a whole. Unlike conventional Italian Ph.D. programs, it allows students to construct a highly individualized course of study, integrating specialization in a particular literary period with work in such fields as art history, classics, comparative literature, feminist studies, film, French history, history of science, linguistics, literary theory, Medieval or Renaissance studies, philosophy, and religion. The program is founded on the belief that this sort of balance between period specialization and interdisciplinary breadth is not only desirable but also essential in a small field such as Italian studies, particularly given the diversity of the Italian literary canon, which extends over a wide variety of disciplines.

Students admitted into the Ph.D. program in Italian work closely with the adviser in structuring a plan of study appropriate to needs and interests. Such a plan usually involves a mix of teaching and courses taken within the Italian program, courses taken in other departments, and independent work under supervision of a member of the Italian faculty, thus integrating financial support with training as scholars and prospective university teachers. Assuming satisfactory academic progress, fellowships are typically offered for three or four years. Graduate-level work completed elsewhere may be counted as fulfilling part of the requirements for the degree. Students in the fifth year normally apply for outside fellowships or part-time teaching positions in the department.

Aside from the benefits of the program’s structure and fellowship plan, a number of unique resources are available to Ph.D. students in Italian at Stanford. During their years of study, students may be permitted to take courses, pursue dissertation research, and do independent work at the Stanford campus in Florence under supervision of a member of the Italian faculty. The Florence center, located in a palazzo along the Arno, is near important Florentine libraries and archives and the University of Florence. Graduate students also have at their disposal the resources of La Casa Italiana, a residential theme house which serves as an Italian cultural center and hosts such events as colloquia, lectures, and film series.

REQUIREMENTS

A candidate for the Ph.D. degree in Italian must complete at least 72 units of graduate-level study beyond the bachelor’s degree and teach five language courses in the section.

Students entering with a master’s degree receive credit for previous graduate work as determined on a case-by-case basis, up to a maximum of 36 units. Fellowship funding and teaching requirements are adjusted according to University regulations.
Required/Recommended Courses—Three courses are required:
1. The Disciplines of Literature (French and Italian 369E), a 5-unit seminar, offered in Autumn Quarter of each year, designed to acquaint students with the theoretical and methodological concerns of literary study. This course must be taken in the first quarter of study.
2. Definition and Inquiry: Colloquium on Research Methods in French and Italian (French and Italian 201E), a 3-unit course designed to familiarize graduate students with research materials and techniques. This course must be taken no later than the end of the third year of study.
3. The Learning and Teaching of Second Languages, the second-language pedagogy course offered by the Stanford Language Center in the Spring Quarter of each year in order to prepare entering graduate students for teaching in their second year.

Apart from the above requirements, students are granted considerable freedom in structuring a course of study appropriate to individual needs. During the first year, most course work is usually done within the Italian Section in order to ensure an adequate preparation for the qualifying examination. In the second and third years, the students' programs normally consist of a combination of course work done inside and outside the Italian Section, supplemented by tutorials and independent work pursued under supervision of the Italian faculty.

Language Requirements—As soon as possible, but not later than the end of the third year, the candidate must have passed reading examinations in two additional foreign languages. If the candidate's period of concentration is earlier than the Romantic period, one of these must be Latin, if Romantic or later, French. Completion of the language requirement is a prerequisite for taking the University oral examination.

EXAMINATIONS

There are three examinations: the 90-minute qualifying exam, the special topic exam, and the University oral examination.

Qualifying Examination—The first oral examination, which normally takes place at the end of Spring Quarter of the first year of study, tests the student's knowledge of the Italian language and of Italian literature. The student is responsible for scheduling the exam one month in advance. The date and time chosen must be determined in consultation with the examining committee (see below).

The exam is based on a standard reading list covering major works from all periods of Italian literature, from the Middle Ages to the late 20th-century. The list may be expanded to reflect a student's particular interests, but not abridged. Half of the exam takes place in English, half in Italian (with the student free to choose which portion transpires in which language).

The exam consists of two parts:

1. A 20-minute presentation by the candidate on a topic to be determined by the student. This presentation may be given either in English or in Italian and should engage, in a succinct and synthetic manner, an issue or set of issues of broad relevance to Italian literary history which the student has been thinking about as he or she has been preparing the exam. The presentation must not simply be a text read aloud, but rather must be given from notes. It is meant to be suggestive and not exhaustive, so as to provoke further discussion.

2. A 70-minute question and answer period in which the examining committee follows up on the candidate's presentation and discusses the reading list with the student. At least part of this portion of the exam takes place in Italian. The student is expected to demonstrate a solid knowledge of the texts on the reading list and of the basic issues which they raise, as well as a broader sense of the cultural-literary context into which they fit. The examination committee for the qualifying examination is made up of the members of the Italian faculty, including the student's faculty adviser who chairs the examination.

Two weeks before the exam, the student must also submit a graduate seminar paper which the student considers representative of the quality of his or her graduate work at Stanford.

On the basis of this paper, the results of the qualifying examination, and an evaluation of the student's overall progress, the members of the student's examining committee vote for or against admission to candidacy for the Ph.D. The terminal master's degree may be awarded to students who have completed the qualifying procedure, but whose work is judged insufficient for admission to candidacy for the Ph.D. If the overall case for or against promotion to candidacy is deemed uncertain, students may be asked either to retake the qualifying exam, to submit a new paper, or they may be admitted to candidacy on a probationary basis. Subject to approval by the Director of Graduate Studies and department Chair, students already holding an advanced degree in Italian Studies, when admitted to the Italian Ph.D. program, may be excused from the qualifying exam. However, they must present a formal request for a waiver to the Director of Graduate Studies upon their arrival at Stanford. Such a request must document the course work completed elsewhere and include all relevant reading lists. Only in cases where taking the qualifying exam would involve considerable repetition of already completed work is such a waiver likely to be granted.

Special Topic Examination—The second oral examination, which normally takes place at the end of Spring Quarter of the second year of study, concerns a topic (a particular literary genre or a broad theoretical, historical, or interdisciplinary question) freely chosen and developed by the individual student working in collaboration with his or her adviser and the Director of Graduate Studies. Students should design this research project so that it has the breadth and focus of a book they might write or a seminar they might teach. The proposed topic should be discussed with the Director of Graduate Studies before the end of the quarter preceding the quarter in which they plan to take the exam. The student and the Director of Graduate Studies choose a committee of two faculty members with interests close to the proposed topic. (In most cases, one of these committee members is the student's adviser.) In addition to these two members, the examination committee includes the Director of Graduate Studies, who serves in an ex officio capacity as the third member of the examination committee.

At the beginning of the quarter in which he or she takes this examination, the student discusses plans for the section with committee members, who offer suggestions on the project and on the reading list. In general, the reading list should be between one and two single-spaced pages in length. In the course of the quarter, the student should regularly consult with committee members to discuss his or her progress. The actual examination lasts one hour. The candidate must present a tentative reading list to the members of the committee about twelve weeks before the examination and a final reading list at least one week before the examination. This list, to be headed by a title describing the topic of the examination, may be divided into two parts: "core" works that the student has found to be central to his or her topic, and works that fill out the "periphery" of the topic. Two copies of the final reading list must be given to the Student Services Officer for the Division of Literatures, Cultures, and Languages: one for the student's file and one for a special file which subsequent students can consult. The examination assumes the form of an oral colloquy between the student and the examining committee. It concentrates on the conclusions to which the student's research has led him or her, and aims to determine the student's overall mastery of the research topic in question. At the beginning of the examination, the student presents a talk of no longer than 20 minutes (not to be written out, but to be presented from notes) reviewing the results of his or her reading and outlining the major features and implications of the chosen topic. The remainder of the hour is devoted to a discussion between the student and the committee regarding the problems the student raised in the talk and the reading list itself.

The following procedures are applicable to both the qualifying and special topic exams:

1. The committee meets briefly at the end of the exam and immediately informs the student as to whether he or she has passed the examination.
2. In the week after the examination, the student is expected to meet individually with members of the committee to discuss strengths and weaknesses revealed during the qualifying exam or colloquy.
3. The Director of Graduate Studies places a brief letter describing each one-hour oral exam in the student’s file, a copy of which is also be furnished to the student.

THE UNIVERSITY ORALS

The University Ph.D. examination follows most of the same procedures outlined above. Normally students put one, and at most two, full-time quarters of study into preparation for the exam. The University oral exam should virtually always be taken at the end of Spring Quarter of the third year of study. Students must complete minimum course requirements (as listed in the Stanford Bulletin) and all language and course requirements before the quarter in which they take the University oral examination.

Early in the quarter before they intend to take the University Ph.D. examination, students must discuss the scope and nature of the period to be covered, as well as the dissertation proposal, with the Director of Graduate Studies. The reading list should include works in all genres relevant to the period covered. The amount of “non-literary” or cross-disciplinary material on the reading list varies according to the period and the research interests of the student. Students ordinarily cover about a century of writing in great depth. As with the preceding examinations, the Director of Graduate Studies and the student determine the committee’s makeup.

The governing principle is that the University oral examination in Italian must be a period examination rather than one on the specific concerns of the dissertation proposal, which is dealt with separately in a later colloquium. It follows from this basic principle that the examination will cover the major authors and genres in the student’s period of choice. The lists may well include critical and scholarly works or texts from outside the traditional domain of Italian literary studies (such as film, philosophy, other literary traditions), but such coverage should be regarded as supplemental except in rare instances where the chair and faculty advisers have agreed to define these materials as the student’s “field.”

The aim of the University oral is to establish the student’s credentials as a specialist in the period of his or her choosing, so the core of the reading list must be made up of texts that constitute the cultural baggage essential to any specialist. It follows that reading lists must not focus on the narrow area of the student’s research interests. The tendency to bias reading lists toward the dissertation topic, be it an author or a genre, does not cancel the obligation to cover the major figures and major genres. It is understandable that some students, by their third year, have become so deeply committed to their work toward the dissertation that they wish to use the preparation period for the examination as part of their dissertation research. Certainly, some of the exam work will prove relevant, but they should also remember that the examination is the central means of certifying their expertise in a literary period.

The exam committee consists of four members, in addition to a committee chair from outside the Department of French and Italian whose principal functions are to keep track of time and to call on the four members of the committee who question the candidate on the talk and on the reading list. Students are required to discuss the reading list for the examination with the Director of Graduate Studies and with members of their committee during the quarter preceding the examination. A final reading list must be in the hands of the committee and the Student Services Officer for the Division of Literatures, Cultures, and Languages no later than two weeks preceding the examination. Students must submit the Request for University Oral Exam form to the Student Services Officer at least three weeks before the proposed date of the exam. At the same time this form is submitted, students should also submit the Notice of Appointment of the Ph.D. Dissertation Reading Committee. In addition, a Report on Ph.D. Foreign Language must be completed, certifying a reading knowledge of the two foreign languages the student presents to meet the language requirements. The two-hour examination consists of the following two parts:

1. Forty minutes: a 20-minute talk by the candidate followed by a 20-minute question and answer period concerning the talk.

Working with the committee members, the candidate’s adviser will prepare three or more questions to be presented to the candidate at 8:00 a.m. on the day of the examination. These questions concern broad topics pertinent to the candidate’s reading list and period of specialization, including concerns relevant, but by no means limited to, the student’s projected dissertation. The candidate chooses one of the questionsler and develops a 20-minute talk in response. Students must not read from a prepared text, but rather must speak from notes. They are free to consult any necessary materials while preparing the talk. The candidate is questioned for 20 minutes on the talk, with the dissertation adviser starting the questioning.

2. One hour, 20 minutes: questions on the area of concentration.

Each member of the committee, except for the chair, is assigned a 20-minute period to question the candidate on the reading list and its intellectual-historical implications.

The University oral examination is a formal University event. It represents the last occasion for the faculty to evaluate a student’s overall preparation as a candidate for the Ph.D. After the University orals, only the colloquium on the dissertation prospectus and certification of the final dissertation by the student’s reading committee stand in the way of conferral of the Ph.D. The examination, therefore, is a uniquely significant event and is designed to evaluate the student’s preparation as a specialist in a given sector of Italian studies, but within a broader context than that provided by a single course, hour examination, or even the dissertation itself.

DISSERTATION

The fourth and (if necessary) fifth years of graduate study are devoted to writing and researching the doctoral dissertation. The dissertation should demonstrate the ability to carry out research, organize, and present the results in publishable form. The scope of the dissertation should be such that it could be completed in 12 to 18 months of full-time work.

Colloquium on the Dissertation Proposal—The colloquium normally takes place in the quarter following the University oral examination; in most cases this means early in Autumn Quarter of the student’s fourth year of study. The colloquium lasts one hour, begins with a brief introduction to the dissertation prospectus by the student (lasting no more than ten minutes), and consists of a discussion of the prospectus by the student and the three readers of the dissertation. At the end of the hour, the faculty readers vote on the outcome of the colloquium. If the outcome is favorable (by majority vote), the student is free to proceed with work on the dissertation. If the proposal is found to be unsatisfactory (by majority vote), the dissertation readers may ask the student to revise and resubmit the dissertation prospectus and to schedule a second colloquium.

The prospectus must be prepared in close consultation with the dissertation director during the months preceding the colloquium. It must be submitted in its final form to the readers no later than one week before the colloquium. A prospectus should not exceed ten double-spaced pages, in addition to which it should include a working bibliography of primary and secondary sources. It should offer a synthetic overview of the dissertation, describe its methodology and the project’s relation to prior scholarship on the topic, and lay out a complete chapter-by-chapter plan.

It is the student’s responsibility to schedule the colloquium no later than the first half of the quarter subsequent to the quarter in which the student passed the University oral examination. The student should arrange the date and time in consultation with the Student Services Officer and with the three examiners. The Student Services Officer schedules an appropriate room for the colloquium.

Members of the dissertation reading committee ordinarily are drawn from the University oral examination committee, but need not be the same.

JOINT DEGREES AND MINORS

A joint degree program in Humanities and Italian Literature is described in the Interdisciplinary Studies in Humanities section of this bulletin. Minors are possible in a wide variety of related fields. Joint degree programs and minors frequently require 24 additional units of work, making completion of all course requirements in nine quarters difficult if careful advance planning is not done.
Ph.D. Minor in Italian Literature—The section offers a minor in Italian Literature. The requirement for a Ph.D. minor is a minimum of 24 units of graduate course work in Italian literature. Students interested in a minor in Italian should consult the graduate adviser.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

FRENCH SECTION

Note—Changes in course offerings after this bulletin has gone to print are sometimes necessary. Students are advised to consult the department bulletin board regularly. Courses are taught in French unless noted.

Introductory and Intermediate Language Courses (1-99)

Advanced Language Courses (100-125)

Undergraduate courses in Literature and Culture (130-199)

Courses for Advanced Undergraduates and Graduates (200-299)

Graduate Seminars (300-399)

GENERAL

These courses are open to all undergraduate and graduate students, are taught in English, and do not require a knowledge of French.

23. Great Works—(Enroll in Introduction to the Humanities 2, 3.)

Given sufficient demand, qualified students may enroll in a French-language discussion section of this course sequence for additional units that count toward the WIM requirement; see 263A.B.

2. The Hereafter—Two-quarter sequence.

5 units, Win (Harrison, Schnapp)

3. The Here and Now—Two-quarter sequence.

5 units, Spr (Landy, Schilling)

14E. The Good Life—(Enroll in Introduction to the Humanities 14.)

5 units, Aut (Elam, Landy, Rehm)

34N. Stanford Introductory Seminar: Other Spaces, Other People—(Same as Comparative Literature 34N.) Preference to freshmen. How “Otherness” and the “elsewhere” have been represented in human imagination and how individual imaginary is influenced by collective representations. Focus is on lost worlds (Atlantis), mythical worlds (underground), invented worlds (Utopia), and the foreigner and stéréotypes. The motives of travel, home and displacement, and their psychological and ideological significance: mourning for lost worlds, search for happiness, desire for deterritorialization or self-fulfillment. Visual material. Readings in theory, literature, and travel accounts. Authors: Plato, Marco Polo, More, Baudelaire, Calvino, Kristeva, Todorov, Dadié, etc. GER:3a (DR:7)

3-5 units, Win (Boyi)

44E. Things of Beauty—(Enroll in Introduction to the Humanities 44.)

5 units, Aut (Gumbrecht, Plebuch)

108N. Stanford Introductory Seminar: Female Saints—The Rhetoric of Religious Perfection—Preference to freshmen. The medieval lives of saintly women. Traditional motifs in the portrayal of perfection (the saint as founding hero); perfection in the literary context of 12th- and 13th-century France (the Lady as Saint); and the rhetorics of female perfection (the body sacrificed). Readings from medieval poems in English translation. Limited enrollment. GER:3a,4c (DR:8f)

4 units, Aut (Cazelles)

115Q. Stanford Introductory Seminar: Thinking in the Present—Discussions about 20th-Century European Philosophy—(Same as Comparative Literature 115Q.) Preference to sophomores. More than the (“analytic”) tradition which dominates in this country, the effort made by European (“continental”) 20th-century philosophy is that of thinking the present with its existential, and political consequences. It implies greater risks and the resulting acceptance of a less rigorous style of argumentation. Readings/discussion of analyses of “present situations,” written by “continental” philosophers and their critics: Adorno/Horkheimer, Butler, Cixous, Derrida, Habermas, Heidegger, Lyotard, Luhmann. Texts deal with the viability (or non-viability) of concepts and patterns of thought in Western cultural and intellectual life (e.g., Subjectivity, Reason, Knowledge, History).

3 units, Aut (Gumbrecht)

147Q. Stanford Introductory Seminar: Camus—Writer and Philosopher—Preference to sophomores. Introduction to the works and thoughts of Albert Camus, one of the most profoundly influential thinkers of our century. The different aspects of his artistic and intellectual production: novels, plays, and philosophical essays. Exploration of two different notions in Camus’ works, that of the absurd, and that of the rebellion against the absurd. Analysis and discussion of works, e.g., The Myth of Sisyphus, The Fall, and The First Man.

3 units, Aut (Apostolidès)

158E. European Drama of the 20th Century—(Enroll in Drama 158E.)

4 units, Spr (Apostolidès)

180E. Aspects of Contemporary French Society through Films—FILMS depicting important events in French society since the War and its sequel, up to today’s problems of societal integration. Emphasis is on “things remembered” films, i.e., autobiographical films in which historical events and a personal experience within them are recreated by the metteur en scène or the author of the script, e.g., Louis Malle’s Au revoir les enfants, or Marguerite Duras’ and J. J. Arnaud’s L’Amant. Films are selected for their filmic quality and their documentary value. GER:3a (DR:7)

4 units, Aut (Bertrand)

189Q. Stanford Introductory Seminar: Romance—Texts and Movies—Preference to sophomores. The concept of romance through an analysis of the “love story” motif in literature and cinema. The myth of Tristan and Isolde, of frustrated passion whose fatalistic overtone exerts a wide influence on Western imagination from medieval romance to contemporary movie makers. Focusing on salient components of the myth (the quest for love, its obstacles, and its tragic resolution), examines the various responses provided by texts and movies. The significance of the love story motif and the reason for its attraction.

4 units, Spr (Cazelles)

190Q. Stanford Introductory Seminar: Parisian Cultures of the 19th and Early 20th Centuries—Preference to sophomores. The extraordinary set of political, social and cultural events in Paris from the Napoleonic era and the Romantic revolution to the 1930s. The arts and letters of bourgeois, popular and avant-garde cultures. Illustrated with slides.

4 units, Spr (Bertrand)

192E. Images of Women in French Cinema: 1930-1990—The myth of the feminine idol in French films is understood by placing it in its historical and cultural context. The mythology of stars was the imaginary vehicle that helped France to change from a traditional society into a modern nation after 1945. Analysis of films from Renoir to Truffaut and Nelly Kaplan; the evolution of the role of women in France over 60 years. Lectures in English. Films in French, with English subtitles. GER:3a,4c (DR:7f)

3-5 units, Spr (Apostolidès)

194Q. Stanford Introductory Seminar: Reality Redefined—The Transition from the First Millennium to the Renaissance—(Same as Italian 194Q) See Italian 194Q.

3-4 units, Win (Fusco, Napolitano)
201E. New Methods and Sources in French and Italian Studies—(Same as Italian 201E.) Based on students' individual interests, surveys changes in research methods: the use of digitized texts, Web resources, and the expanding databases available through Stanford Library's various gateways. Emphasis is on the strategy for the most effective exploration of broad and specialized topics through a mix of new and traditional methods. Using a flexible schedule based on enrollment and the level of students' prior knowledge, may be offered in various forms, including a shortened version on the basics, independent study, or a syllabus split over two quarters. Unit levels are adjusted accordingly.
1-4 units, Aut (Parrine)

201L. The Teaching of Second Language Literatures—(Enroll in Special Language Program 200.) ~
3-5 units, Spr (Bernhardt)

228E. Getting through Proust—Seminar on representative selections from all seven volumes of In Search of Lost Time. Discussion themes: habit, heredity, constitution of the Self; language, names, metaphor, and metonymy; aesthetics, music, photography, and painting; truth and lies, belief and disenchantment, sleep and dreams; memory, time modernity, and technology; friendship, love, homosexuality, jealousy, and mediated desire. Readings in French or English.
5 units, Aut (Landy)

254E. Introduction to French Philosophy: From 1943 to the Present—From the glorification of subjectivity (existentialism) to the funerals of the subject (structuralism, post-structuralism, deconstruction) to a modest theory of agency in the contemporary revival of social, moral, and political philosophy. Readings: Sartre, Lévi-Strauss, Lacan, Bourdieu, Derrida, Dumont, Lefort, Castoriadis, Ricouer, Manent, Dupuy, Ferry, Renault, Gauchet. GER:3a (DR:8)
3-5 units, Spr (Dupuy)

3-5 units, Aut (MacCannell)

317E. Crowds—(Same as Italian 317E.) See Italian 317E.
5 units, Spr (Schnapp)

369E. The Disciplines of Literature—(Same as Comparative Literature 369E, Italian 369E.) Open to all entering graduate students in the Division of Literatures, Cultures, and Languages. Introduction to the history, structure, and intellectual debates of the disciplines of literary study. The origins of comparative and national literatures in the study of the Classics from Renaissance theories of innutrition to Cesare Pavese’s Dialoghi con Leucò, from Tasso to Chateaubriand, from Racine to Montale.
5 units, Win (Cavallin)

FIRST- AND SECOND-YEAR LANGUAGE

Note—Students registering for the first time in a first- or second-year course must take a placement test if they had any training in French before entering Stanford. All entering students must take Part I (written) of the placement test on-line during the summer, followed by Part II (oral), to be administered on campus 9/24/00. Consult the Stanford Language Center for further information or http://language.stanford.edu/.

Basic French grammar and vocabulary are covered in French 1, 2, and 3. At the completion of 3, students will have acquired beginning level functional proficiency in listening comprehension, speaking, reading, and writing in satisfaction of the University Foreign Language Requirement. Students may continue with second-year French courses (22 or 23) or higher level courses upon recommendation of the Language Program Coordinator.

Auditing is not permitted in lower division language courses.

1.2.3. First-Year French—Introduction to basic communication skills using an all-in-French, student-centered approach. By the end of the three-quarter sequence, students are able to engage in interactions with speakers of French for a variety of purposes and contexts using appropriate forms of address. Emphasis is placed on development of listening comprehension, oral skills, and written expression, with exposure to a variety of French and Francophone texts and videos in the development of authentic discourse. Utilization of language lab, multimedia, and computer facilities in the language learning process.
5 units, Aut, Win, Spr (Staff)

5A. Accelerated First-Year French—Completes the first-year language sequence in two rather than three quarters. Recommended for students who have previous knowledge of French and who place into 5A on the placement test. All others are encouraged to take the regular sequence (1,2,3). Prerequisite: French placement test and permission of the Language Program coordinator.
5 units, Aut, Win, Spr (Langmuir)

10. First-Year Conversation—Introduction to French conversation for students who have completed French 2 or equivalent. Emphasis is on the development of authentic discourse at the first-year level. May be repeated for credit. Prerequisite: 2 or equivalent.
2 units, Aut, Win, Spr (Staff)

15. Conversation in Everyday Life—Second-year French conversation for students who have completed French 3 or equivalent. Topics: the family, student life, films, theater, fashion, food, politics, etc. Useful information for students planning to travel/study abroad. May be repeated for credit. Prerequisite: 3 or equivalent.
2 units, Aut, Win, Spr (Staff)

15S. Intermediate Conversation—Second-year French conversation designed to improve communication in everyday situations. Topics: student life, films, theater, fashion, food, politics, etc. No auditors. Prerequisite: one year of college French or equivalent.
3 units, Sum (Staff)

20A. French Survival Skills—Second-year French conversation for students who have completed French 3 or equivalent. Learn to use the Paris subway system, make hotel reservations, use the Minitel, travel by TGV, etc. Prerequisite: 3 or equivalent.
2 units, Aut (Staff)

20B. French Cinema—Second-year French conversation for students who have completed French 3 or equivalent. Introduction to major French film-makers, stars, and trends. Discussion in French of selected films. Prerequisite: 3 or equivalent.
2 units, Win (Staff)
20C. France and Francophonie—Second-year French conversation for students who have completed French 3 or equivalent. Exposure to regions of France and the Francophone world. Topics: travel, food, cross-cultural comparisons, etc. Useful information for students planning travel/study abroad. Students returning from study abroad programs are encouraged to enroll. Prerequisite: 3 or equivalent.

<table>
<thead>
<tr>
<th>Units</th>
<th>Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>Second-Year French (Part B) — Content-based, intermediate level. Designed to integrate culture and language in the development of authentic discourse. Review of present and past narrative, pronominal verbs, etc. Combines the study of grammar with discussion of French and Francophone texts. Utilization of language lab, multimedia, and computer facilities in the language learning process. Extra unit for individual or group projects. Satisfies the foreign language requirement for students majoring in English. Prerequisite: 3 or equivalent, or consent of coordinator.</td>
</tr>
<tr>
<td>4-5</td>
<td>4</td>
<td>Second-Year French (Part A) — Content-based, intermediate level. Designed to integrate culture and language in the development of authentic discourse. Review of present and past narrative, pronominal verbs, etc. Combines the study of grammar with discussion of French and Francophone texts. Utilization of language lab, multimedia, and computer facilities in the language learning process. Extra unit for individual or group projects. Prepares students for advanced courses and for study abroad. Satisfies the foreign language requirement for students majoring in International Relations. Prerequisite: 22 or equivalent, or consent of coordinator.</td>
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</tbody>
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40. Intensive French Specials—By petition only and with consent of instructor. Students with special programmatic needs for an alternate curriculum may complete 3-9 units through a combination of course work and tutorials. No auditors.

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<tbody>
<tr>
<td>3-9</td>
<td>3</td>
<td>Reading French—For graduate students or seniors seeking to meet the University reading requirement for advanced degrees. Accelerated, designed specifically for the acquisition of reading ability. No auditors.</td>
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<tr>
<td>4</td>
<td>4</td>
<td>Advanced Language</td>
</tr>
<tr>
<td>1-5</td>
<td>1</td>
<td>Language Specials—With consent of department only. See instructor for section number.</td>
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101L. Introductory Electronics—French Discussion Section—For students enrolled in Engineering 40.

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<th>Units</th>
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<th>Description</th>
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<tbody>
<tr>
<td>1-3</td>
<td>1</td>
<td>Introductory Science of Materials—French Discussion Section—For students enrolled in Engineering 50.</td>
</tr>
<tr>
<td>1-3</td>
<td>1</td>
<td>Engineering Economy—French Discussion Section—For students enrolled in Engineering 60.</td>
</tr>
<tr>
<td>1-3</td>
<td>1</td>
<td>Ethics and Public Policy—French Discussion Section—For students enrolled in Science, Technology, and Society 110.</td>
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</tbody>
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111. Advanced Topics in Business French—Advanced language course for students interested in practicing professional business French. Discussion of selected topics pertaining to international economics, management, and marketing (e.g., international financial markets, global management, etc.). Prerequisite: 23 or equivalent.

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<tr>
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<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>Advanced Conversation: France Today—Third-year conversation. Discussion of contemporary issues and topics of general interest. May be repeated for credit after two quarters. Prerequisite: 23 or equivalent.</td>
</tr>
<tr>
<td>1-3</td>
<td>1</td>
<td>Business French—For students who wish to function and communicate in the French-speaking business community. Resume-writing and the job application process for on-site employment, acquisition of specialized vocabulary, discussions, and written work, including translations and business letters. Prerequisite: 23 or equivalent.</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>Introduction to French Culture and Civilization—Content-based language course introducing French culture and civilization through the reading of selected texts. Emphasis is on the development of language skills through the study of art, geography, history, political and social institutions, etc. Prerequisite: 23 or equivalent.</td>
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</table>

123. Creative Writing—Writing as practical communication and as literature. The cultural and social determinants in shifting from spoken to written French, formal and informal. Textual analysis and creative writing is centered on various genres and styles (e.g., letters, essays, short stories, poems; description vs. narration). Grammar and vocabulary review. Class discussion in French focuses on model texts and original writing done by students. Prerequisite: 23 or equivalent. (WIM) |

124. Intensive Review of French Grammar—Intensive review of French grammar for highly motivated students who plan to enroll in advanced courses on campus and/or abroad. Emphasis is on individual work in the language lab with class time spent on contextualized activities and textual analysis. Prerequisite: 23 or equivalent, or consent of coordinator. |

128. Technocritique—The French tradition of social and philosophical criticism of technology. The apparent contradiction between being at the forefront of technological and scientific development and the demand for prudence, because technological development is not always perceived as a synonym of social and moral progress. |

130. Middle Ages and Renaissance France—Introduction to the literature and culture of France, 11th-16th century. Readings from the epics (The Song of Roland), medieval romances (Yvain, Chretien de Troyes), post-Petrarchan poetics (Du Bellay, Ronsard), and prose humanists (Rabelais, Montaigne). GER:3a (DR:7) |

131. 17th- and 18th-Century France—Introduction to the literature and culture of France from the Baroque to the Enlightenment. Readings:
132. 19th- and 20th-Century France—French literature from the beginning of the 19th-century to the present, with the critical concepts necessary for an approach to the literary texts. The major literary genres and social and cultural contexts. Focus is on the emergence of new literary forms and new preoccupations in literature, as illustrated by such movements or schools as Surrealisme, nouveau théâtre, nouveau roman. The broadening of the traditional canon by taking into account questions of concern for feminist studies and Francophone writers outside France. GER:3a (DR:7)

3-5 units, Win (Apostolidès)

133. Literature and Society: Introduction to Francophone Literature from Africa and the Caribbean—Focus is on major African and Caribbean writers, and the major issues raised in literary works which reflect changing aspects of the societies and cultures of Francophone Africa and the French Caribbean: meeting the challenge of acculturation and the search for identity; of tradition competing with modernity; the use of oral tradition and writing; women’s role and status; writers’ social responsibility. Visual material; readings from fiction, poetry, plays, and criticism. GER:3a,4a (DR:2 or 7)

4 units, Win (Boyi)

198. Honors—Open to juniors and seniors with consent of adviser; 9-12 units total credit for completion of honors essay.

3-12 units (Staff)

199. Individual Work—Open only to majors in French with consent of department. Normally limited to 4-unit credit toward the major.

1-12 units (Staff)

ADVANCED UNDERGRADUATE AND GRADUATE

Note—The prerequisite for the following courses taught in French is one course from the 130 series or equivalent.

205. Introduction to Old French Literature—Introduction to some “canonical” and (less canonical) works from the premodern period of French literature. Topics: the gradual evolution from literate orality to the culture of literacy; the sociopolitical role of literature in shaping the collectivity; sensing the world through fiction; the emergence of the concept of writing as a self-defining act. GER:3a (DR:7)

4 units, Aut (Cazelles)


5 units, Win (Apostolidès)

261. Stylistics and Textual Analysis—Designed to assure a high-level proficiency in written French. In-depth textual analysis and commentary of excerpts from various genres. Different styles of criticism. The exposé, written and spoken. Prerequisite for undergraduates: 123. (WIM)

3-5 units, Win (Hester)

262. Pronunciation and Phonetics—Theory study and corrective work: articulation, intonation, rhythm, phonetic alphabet, etc.

3-5 units, Aut (Hester)

263A.B. Great Works French Discussion Section—Given sufficient demand, qualified students may enroll in this French-language discussion section of the two-quarter sequence of Introduction to the Humanities 2, 3 for additional units that count toward the WIM requirement. Prerequisite: 4 or 5 on French AP exam, or consent of instructor. (WIM)

263A. The Hereafter—Two-quarter sequence.

3 units, Win (Staff)

263B. The Here and Now—Two-quarter sequence.

3 units, Spr (Staff)

270. New French Theater—A dramatic analysis and voicing of theatrical texts by contemporary playwrights. Evolving notions of mise-en-scène, political commitment, collective creation, and institutional politics in France since 1975. Authors: Cixous, Cormen, Koltes, Kundera, Bacri and Jaoui, Mnouchkine, and Redonnet.

4 units, Spr (Schilling)


3-5 units, Win (Bertrand)

278. Topics in French and Francophone Literature: Discourse on Self-Representation—Critical analysis of major issues relating to literatures in French and outside France, focusing on Negritude and Surrealism, the question of the Other, and the problematic of Identity. Readings: Céaire, Dadié, Kane, Glissant, Sartre, Barthes, and Todorov. GER:3a (DR:7)

3-5 units, Spr (Boyi)

281. Music with Words: An Introduction to the Reading of French Poetry—The technical instruments necessary for the reading of French poetry, from classical malherbian poetics to modern blank verse (poetical figures and typology, metric systems, vocalic analysis, relations between prosidic and syntactic orders) through an intensive survey of late 19th-century poetry from Baudelaire to Mallarmé. Emphasis is on the discrepancy between “what poems say” and “how poems mean”: a discrepancy essential to the domain of the poetic and upon which is founded the difference between paraphrase and poetical analysis.

3-5 units, Aut (Cavallin)

282. Form and Ideology in the Detective Novel—Narratological, political, and sociological perspectives. The constraints of the roman policier in its classic mode, the use of popular speech and cinematic technique, and the transformations of the genre in light of identity politics of the 1990s. Readings from Barthes, Todorov, Ginzburg, Boileau-Narcejac, Japrisot, Malet, Manchette, and Daeninckx.

4 units, Aut (Schilling)


2 units, Aut (Serres)


2 units, Spr (Serres)

299. Individual Work—For students engaged in special work.

1-12 units, any quarter (Staff)

GRADUATE

364. The Making of the Paris Suburbs: Spatial Stereotypes and Literary Discourse—How the literary description of built space participates in the formation of stereotypes. The functions suburbs have been called upon to play in the literary imaginary, The extent of the historical newness of the contemporary fear of the banlieues as a site of otherness and decay. Topics: hygiene, the right to housing, immigration and revolt, parigocentrisme, and descriptive ethnography. Readings: Céline, Cen-
121/321. 18th-Century Art in Europe, ca. 1660-1780
4 units (Marrinan) not given 2000-01

122/322. Painting in the Age of Revolution
4 units, Win (Marrinan)

124/324. The Age of Naturalism, ca. 1830-1874
4 units, Spr (Marrinan)

126/326. Post-Naturalist Painting
4 units (Marrinan) not given 2000-01

420. Crossroads of the Enlightenment—The Artistic Culture of Rome in the mid-18th Century
4 units (Marrinan) not given 2000-01

501. The Vision of Art History
4 units (Marrinan) not given 2000-01

503. Notions of “The Public” in Art Historical Discourse
4 units (Marrinan) not given 2000-01

516. Narrative Theory and Visual Forms
4 units (Marrinan) not given 2000-01

519. Looking at Violence
4 units (Marrinan) not given 2000-01

GERMAN STUDIES

276. Primitivism in Early 20th-Century Europe
3-5 units, Aut (Pan)

HISTORY

358. Sources and Methods Seminar: 20th-Century History as Lived Experience
5 units, Win (M. L. Roberts)

232A. Undergraduate Colloquium: Shopping—A History
5 units, Aut (M. L. Roberts)

331E. Graduate Core Colloquium on Modern Europe: The 19th Century
4-5 units, Win (M. L. Roberts)

ITALIAN SECTION

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Introductory Language Courses (1-99)
Advanced Language Courses (100-129)
Undergraduate courses in Literature and Culture (130-199)

399. Individual Work—For students in French working on special projects or engaged in predissertation research.
1-12 units, any quarter (Staff)

ART AND ART HISTORY

AFFILIATED DEPARTMENT OFFERINGS

121/321. 18th-Century Art in Europe, ca. 1660-1780
4 units (Marrinan) not given 2000-01

122/322. Painting in the Age of Revolution
4 units, Win (Marrinan)

124/324. The Age of Naturalism, ca. 1830-1874
4 units, Spr (Marrinan)

126/326. Post-Naturalist Painting
4 units (Marrinan) not given 2000-01

420. Crossroads of the Enlightenment—The Artistic Culture of Rome in the mid-18th Century
4 units (Marrinan) not given 2000-01

501. The Vision of Art History
4 units (Marrinan) not given 2000-01

503. Notions of “The Public” in Art Historical Discourse
4 units (Marrinan) not given 2000-01

516. Narrative Theory and Visual Forms
4 units (Marrinan) not given 2000-01

519. Looking at Violence
4 units (Marrinan) not given 2000-01

COMPARATIVE LITERATURE

210. Women Writers of Early Modern Europe
4-5 units, Spr (Middlebrook)

310E. Lyric Economies in the European Renaissance
4-5 units, Spr (Middlebrook)

331E. Graduate Core Colloquium on Modern Europe: The 19th Century
4-5 units, Win (M. L. Roberts)

GERMAN STUDIES

276. Primitivism in Early 20th-Century Europe
3-5 units, Aut (Pan)

HISTORY

358. Sources and Methods Seminar: 20th-Century History as Lived Experience
5 units, Win (M. L. Roberts)

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Introductory Language Courses (1-99)
Advanced Language Courses (100-129)
Undergraduate courses in Literature and Culture (130-199)

Courses for Advanced Undergraduates and Graduates (200-299)
Graduate Seminars (300-399)

GENERAL

These courses are open to all undergraduate and graduate students, are taught in English, and do not require a knowledge of Italian.

2E. The Hereafter—Two-quarter sequence.
5 units, Win (Harrison, Schnapp)

3E. The Here and Now—Two-quarter sequence.
5 units, Spr (Landy, Schilling)

40E. Conversions, Past and Present—(Enroll in Introduction to the Humanities 40.)
5 units, Aut (Harrison, Sheehan)

44E. Things of Beauty—(Enroll in Introduction to the Humanities 44.)
5 units, Aut (Gumbrecht, Plebuch)

185E. The Dawn of a New Vision: The Evolution of Scientific and Philosophical Thought from the Late Middle Ages to the Western Renaissance (1000-1500)—The highlights of the evolution of science from the Greek beginnings (500 B.C.) to the end of the scholastic period (1450 A.D.), and of its impact on philosophy, theology, and cosmology. The development of major paradigms within science, e.g., Ptolemaic cosmology, and the formulation of epistemological constructs which lie outside the domain of science proper (rationalism, occasionalism, materialism, etc.). Focus is on the interplay between physical theory, philosophical interpretation, and subsequent impact on other fields, e.g., theology. Special discussion section for students with prior knowledge of Italian. Recommended: some knowledge of general European history.
3-5 units, Aut (Fusco)

194Q. Stanford Introductory Seminar: Reality Redefined—The Transition from the First Milenium to the Renaissance—(Same as French 194Q.) Preference to sophomores. How the early Medieval world view, with its emphasis on “esoteric knowledge” and “occult forces” gave way to the scientific paradigm of the 16th century. The redefinition of reality achieved by religious, philosophical, political, and economic developments, all coming together, albeit not always harmoniously. The evolution of Western political, social, and economic organizations and their reciprocal effects on the growth of science from 1000 A.D. to 1450 A.D. The active process of development and change led by the schools of scientific thought of Paris, Bologna, Padua, and Oxford.
3-4 units, Win (Fusco, Napolitano)

201E. New Methods and Sources in French and Italian Studies—(Same as French 201E.) See French 201E.
1-4 units, Aut (Parrine)

201L. The Teaching of Second Language Literatures—(Enroll in Special Language Program 200.)
3-5 units, Spr (Bernhardt)

235E. Inferno—Intensive study of the first canticle of Dante’s masterpiece. GER:3a (DR:7)
4 units, Win (Harrison)

236E. Purgatorio, Paradiso—Intensive study of the second and third canticles of Dante’s masterpiece. GER:3a (DR:7)
4 units, Spr (Harrison)

317E. Crowds—(Same as Comparative Literature 317E, French 317E.) Interdisciplinary research seminar concerned with the rise and fall of the crowd, particularly the revolutionary crowd, in the Western sociopolitical imaginary between 1789 and the present. Theorizations of collectivity in works by Le Bon, Sighele, Freud and Elias Canetti.
Representations of crowds and masses in works of literature, art (painting, photography, cartooning, photomontage), and film. Exploration of Le Bon’s definition of modernity as “the era of crowds,” the ways in which modern mass mythologies are informed by premodern precedents (Greco-Roman political and rhetorical theory, premodern art and literature) and the seeming decline of political models founded upon the agency of crowds in post-industrial societies. Recommended: reading of at least one foreign language for course readings.

5 units, Spr (Schnapp)

369E. The Disciplines of Literature—(Same as Comparative Literature 369E, French 369E.) See French 369E.

5 units, Aut (Gumbrecht, Schnapp)

385E. Retracing One’s Texts: The Art of Writing and the Recycling of the Classics—(Same as French 385E.) See French 385E.

5 units, Win (Cavallini)

FIRST- AND SECOND-YEAR LANGUAGE

Note—Because the Italian Language Program does not have a formal placement test, students registering for the first time in a first- or second-year course must see the instructor for proper placement if they have had any prior training in Italian.

For more detailed course information, please see the Italian language website: http://www.stanford.edu/dept/italianlanguage.

1. First-Year Italian (First Quarter)—Intensive introduction to the Italian language, with emphasis on speaking and oral comprehension. Language lab.

5 units, Aut, Win, Spr (Staff)

2. First-Year Italian (Second Quarter)—Continuation of 1 with emphasis on the development of reading and writing skills, and on Italian culture. Language lab. Prerequisite: 1 or equivalent.

5 units, Aut, Win, Spr (Staff)

3. First-Year Italian (Third Quarter)—Continuation of 1 and 2 with additional cultural and literary readings. Language lab. Prerequisite: 2 or equivalent.

5 units, Aut, Win, Spr (Staff)

21. Second-Year Italian (First Quarter)—Intermediate course for students developing and refining their basic Italian skills. A thorough review of grammatical structures. Reading, writing, and conversational competency is emphasized through the study of Italian culture; global awareness and cross-cultural understanding through the use of authentic materials, e.g., literary texts, news clippings, film, video, music, websites, etc. The language lab facilitates the development of communicative proficiency. Prerequisite: 3 or equivalent.

3-4 units, Aut, Win (Baldocchi, Devine)

22. Second-Year Italian (Second Quarter)—Continuation of 21 with emphasis on translation, stylistics, and composition. Prerequisite: 21 or equivalent.

3-4 units, Win, Spr (Devine, Napolitano)

23. Second-Year Italian (Third Quarter)—Continuation of 22. Prerequisite: 22 or equivalent.

3-4 units, Aut, Spr (Napolitano)

30. Learning about Italy—Conversation for students planning to go to Florence. Films, slide shows, and lectures on Italian culture, including opera, modern music, wine, and food. A preview of the Florentine experience. Prerequisite: consent of instructor. Recommended: two to three quarters of Italian.

3 units, Win, Spr (Tempesti)

31. Talking about Italy—Open only to students who have studied at the Florence program. Have you got a favorite Italian wine or city, a favorite author, or movie director that you have studied in depth? Students share their experiences with their comrades from Florence and those preparing to go to Italy. Brief presentation to students in the beginning first-year Italian sequence. Prerequisite: study abroad in Florence or equivalent.

3 units (Napolitano) not given 2000-01

41A,B,C. Accelerated First-Year Italian—Covers one, two or three quarters of Italian. Conversational drills and daily work in the language lab. All-in-Italian method is used, developing the four basic skills: listening, speaking, writing, and reading. No auditors.

9-12 units, Sum (Staff)

50. Reading Italian—Open to advanced undergraduates with consent of instructor; primarily for graduate students seeking to fulfill University foreign language requirements for advanced degrees. Accelerated, designed for the acquisition of reading skills in Italian. No auditors.

3 units, Win (Devine)

60. Italian Opera from the Early 19th Century (Rossini) to the Early 20th Century—Italian history through the operatic melodramas from the heroic epic of the Risorgimento to the social anguish of Venismo, which brings Italian opera to California as in the Girl of the Golden West by Puccini. Students attend at least two opera performances.

3-4 units, Aut (Napolitano)

99. Language Specials—With consent of department only. See instructor for section number.

1-5 units (Staff)

114. Advanced Stylistics and Composition—Designed to achieve a high level of proficiency in written and spoken Italian. Readings of literary and non-literary texts with in-depth textual and grammatical analysis in class, oral reports, translations, and weekly writing assignments. Prerequisite: 22 or consent of instructor. (WIM)

3-4 units, Win (Napolitano)

115. Translation and Composition—Continuation of 114. Emphasis is on composition, writing of short essays, and short stories. Prerequisite: 114 or consent of instructor. (WIM)

3-4 units, Spr (Napolitano)

120. Stile Italiano: Fashion—Advanced conversation, intended as a follow-up to or preparatory course for “Stile Italiano—Design and Architecture” offered at the Florence campus during the Winter Quarter. The study of Italian fashion: its history, economics, and present state. Introduction to fashion design processes and to the history of the major firms (e.g., Ferragamo, Armani, Krizia, Prada, Gucci, etc.). Site visits and guest lectures, organized in association with the Casa Italiana, and an end-of-the-quarter fashion show.

3-4 units, Spr (Poli)

LITERATURE, THOUGHT, AND CULTURE

UNDERGRADUATE

127. Framing Italian History—The history of the Italian nation from Risorgimento to the present day. Focus is on the question of national identity, the origins and overthrow of Fascism, the changing status of women, the Mafia, challenges to democracy. Films, slides, videos, readings. (In Italian) Prerequisite: 3 or equivalent. GER: 3a (DR: 7)

4 units, Aut (Springer)

128. Inventing Italian Literature: Dante/Petrarca/Boccaccio—The origins of Italian literature in poetry (the love lyrics of Dante and Petrarch) and prose (stories from Boccaccio’s Decameron). Prerequisite: 3 or equivalent. GER: 3a (DR: 7)

4 units, Win (Springer)

129. The Path to Modernity: Renaissance to Pirandello—Analysis of a series of influential Italian texts from the 16th to the 20th century:
Readings: Ariosto, Tasso, Goldoni, Leopardi, Verga, Pirandello. Prerequisite: 3 or equivalent. GER:3a (DR:7)
4 units, Spr (Springer)

198. Honors—Open to juniors and seniors with consent of adviser; 9-12 units total credit for completion of honors essay.
3-12 units (Staff)

199. Individual Work—For students engaged in special work. See instructor for section number.
1-12 units (Staff)

ADVANCED LITERATURE

4 units, Win (Springer)

299. Individual Work—For students engaged in special work. See instructor for section number.
1-12 units, any quarter (Staff)

GRADUATE

399. Individual Work—For graduate students engaged in work on a special project in the field of Italian studies or predissertation research. May be repeated for credit. See instructor for section number.
1-12 units, Aut, Win, Spr, Sum (Staff)

AFFILIATED DEPARTMENT OFFERINGS

ART AND ART HISTORY

112/312. The Venetian Renaissance
4 units (Berndri) not given 2000-01

115/315. Renaissance Architecture, 1420-1580
4 units (Berndri) not given 2000-01

117/317. Baroque Painting
4 units (Berndri) not given 2000-01

147/347. The Bauhaus
4 units (Berndri) not given 2000-01

518. Graduate Seminar: Scopophilia—On Visual Pleasure
4 units (Berndri) not given 2000-01

COMPARATIVE LITERATURE

210. Women Writers of Early Modern Europe
4-5 units, Spr (Middlebrook)

310E. Lyric Economies in the European Renaissance
4-5 units, Spr (Hampton)

314. Seminar: Epic and Empire—(Same as English 314.)
5 units, Win (Parker)

HISTORY

13. The Emergence of Modern Medicine
5 units, Spr (Findlen)

216/316. Undergraduate/Graduate Colloquium: When Worlds Collide—The Trial of Galileo
5 units, Win (Findlen)

SCIENCE, TECHNOLOGY, AND SOCIETY

102. Science, Technology, and Art: The Worlds of Leonardo
3-5 units, Aut (Gorman)

The following courses are accepted for credit in the major. See the respective department listing for course descriptions and General Education Requirements (GER) information.

CLASSICS

205A,B. The Semantics of Grammar
2 units, Aut (Devine)
1 unit, Win (Devine)

LINGUISTICS

1. Introduction to Linguistics
4 units, Win (Leben)

GERMAN STUDIES

Emeriti: (Professors) Theodore M. Andersson, Gerald Gillespie, Walter F. W. Lohnes, Katharina Mommsen, Kurt Mueller-Vollmer; (Adjunct Professor) Gertrude Mahrholz; (Senior Lecturer) Brigitte Turnearoue
Chair: Orrin W. Robinson III
Professors: Russell A. Berman, Elizabeth Bernhardt, Orrin W. Robinson III
Assistant Professors: Amir Eshel, Karen J. Kenkel, Sara S. Poor, Arthur C. Strum (on leave)
Senior Lecturers: William E. Petig, Kathryn Strachota
Lecturer: Henry Lowood
Acting Assistant Professors: Therese Augst, David Pan

The department offers a variety of programs in German language and linguistics, literature, culture, and thought. Courses are open to majors and all interested students. Candidates are accepted for the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy.

By carefully planning their programs, students may fulfill the A.B. requirements for a double major in German Studies and another subject. An extended undergraduate major in English and German literature is available, as are coterminal programs for the A.B. and A.M. degrees in German Studies, and joint programs for the Ph.D. degree with Comparative Literature, Interdisciplinary Studies in Humanities, Linguistics, and Modern Thought and Literature.

Special collections and facilities at Stanford offer possibilities for extensive research in German Studies and related fields pertaining to Central Europe. Facilities include the Stanford University Libraries and the Hoover Institution on War, Revolution, and Peace. Special collections include the Hildebrand Collection (texts and early editions from the 16th to the 19th century), the Austrian Collection (with emphasis on source material of the time of Maria Theresa and Joseph II, the Napoleonic wars, and the Revolution of 1848), and the Stanford Collection of German, Austrian, and Swiss Culture. New collections emphasize culture and cultural politics in the former German Democratic Republic. The Hoover Institution has a unique collection of historical and political documents pertaining to Germany and Central Europe from 1870 to the present. The department also has its own reference library. Extensive use is made of the language lab in the Undergraduate Library as well as the department's own audio-visual equipment, films, tapes, and slides.

The Republic of Austria has endowed the Distinguished Visiting Professorship in Austrian Studies. The professorship rotates on a yearly basis through several departments.

Haus Mitteleuropa, the German theme house at 620 Mayfield, is an undergraduate residence devoted to developing an awareness of the culture of Central Europe. A number of department courses are regularly taught at the house, and there are in-house seminars and conversation courses. Assignment is made through the regular undergraduate housing draw.
UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The major in German Studies provides students with the linguistic and analytic facility to explore the significance of the rich cultural traditions and political histories of the German-speaking countries of Central Europe. At the same time, the interdisciplinary study of German culture, which can include art, history, literature, media theory, philosophy, political science, and other areas, also encourages students to evaluate broader and contradictory legacies of modernity. For example, the literary, artistic, and cultural responses to the belated and rapid modernization of Germany allow for reflection on the modern condition in general.

Similarly, the German experience of national identity and political unification sheds light on wider issues of cultural cohesion and difference, and as well on the causes and meaning of phenomena such as racial prejudice, anti-Semitism, and the Holocaust. In general, an education in German Studies not only encourages the student to consider the profound effects of German-speaking thinkers and artists on the modern world, but also provides a lens through which the particular contours of the present and past can be evaluated.

Majors in German Studies formulate their plans in quarterly consultation with an undergraduate major adviser. Majors must demonstrate basic language skills, either by completing German 3 or the equivalent, such as an appropriate course of study at the Stanford in Berlin Center. Students then enroll in intermediate and advanced courses on literature, culture, thought, and language. Requirements for the A.B. include at least three courses at the 130-139 level (introductory surveys on topics in German literature, thought, linguistics, and culture). Of these courses, every major is expected to complete at least one Writing in the Major course. Including German 1, 2, 3, the total requirement for the A.B. is a minimum of 60 units of work. With the approval of the adviser, appropriate courses offered by other departments can be accepted toward this total, up to a maximum of 25 units.

Internships—Internships in Germany are arranged through the Overseas Studies program. In addition, students may consult with the department to arrange local internships involving German language use or issues pertaining to Germany or Central Europe. Interns who prepare papers based on their experience enroll in 298.

Extended Major in English and German Literatures—Students may enter this program with the consent of the chairs of both departments. See the "English" section of this bulletin.

Multiple Majors—Students can combine a major in German Studies with a major in any other field. By carefully selecting courses in such disciplines as history, international relations, or economics, students can prepare themselves exceptionally well in the area of Central Europe. Multiple majors are especially recommended for students spending one or more quarters at the Stanford Center in Berlin.

MINORS

There are two minor options.

German Language and Culture—Students may choose to minor in German Language and Culture if they are particularly interested in developing a strong ability in the German language, or in pursuing linguistic issues pertinent to German. Students satisfy the requirements for the minor in German Language and Culture by completing 35 units of course work, including at least three courses at the 100-129 level, taught in German. Study at the Stanford Center in Berlin for at least one quarter is highly recommended.

German Cultural Studies—Students who wish to study German literature, culture, or thought, without necessarily acquiring facility in the German language, may pursue a minor in German Cultural Studies. Students meet the requirements for the minor in German Cultural Studies by completing 35 units of course work in German literature, culture, and thought in translation, including at least three courses at the 130 or 140 level. (Five units of the Introduction to the Humanities sequence Myth and Modernity may be counted towards the completion of requirements for the minor in German Cultural Studies).

HONORS

Majors with a minimum grade point average (GPA) of 'B+' in German courses are eligible for departmental honors. In addition to the requirements listed above, each honors candidate submits an essay representing 6 to 9 units of academic work. The essay topic is chosen in consultation with a faculty member of the department. Opportunities to commence research projects are offered at the Berlin Center.

STANFORD IN BERLIN

All undergraduates interested in Germany are urged to enroll in the Berlin program, which is open for academic study Autumn, Winter, and Spring quarters. The program also offers internships in German industry, government, and cultural organizations year round. Through the center, students with at least two years of college-level German can also take courses at Freie Universität, Technische Universität, or Humboldt University. Most students live in homes with German hosts.

Most credits earned in Berlin can be applied to the undergraduate major in German Studies. All students who are planning to study at the Stanford Center in Berlin or engage in an internship are encouraged to consult with their major advisers and the Overseas Studies office about integrating work done abroad into their degree program. Returning interns who wish to develop a paper based on their experience should enroll in 298. More detailed information is available at the Overseas Studies Office in Sweeney Hall or with the faculty adviser in the department.

COTERMINAL PROGRAMS

Students may elect to combine programs for the A.B. and A.M. degrees in German Studies. For details, see the "Undergraduate Degrees" section of this bulletin.

GRADUATE PROGRAMS

The University requirements for the A.M. and Ph.D. degrees are described in the "Graduate Degrees" section of this bulletin.

MASTER OF ARTS

This program is designed for those who do not intend to continue studies through the Ph.D. degree. Students desiring the A.M. degree must complete a minimum of 36 units of graduate work. If students enroll for three quarters for a minimum of 12 units per quarter, they can fulfill the A.M. requirements in one year. The program normally includes at least one course in each of the three areas of concentration: language and linguistics, literature, and thought. In addition, students must take graduate-level courses in German and/or approved courses in related fields such as art history, comparative literature, linguistics, history, or philosophy.

A.M. candidates must take an oral examination toward the end of their last quarter.

DOCTOR OF PHILOSOPHY

The requirements for the Ph.D. include: (1) a minimum of 36 graduate units during the first year of graduate study and a minimum of 9 units per quarter during the six quarters following the first year; (2) a reading knowledge of one language other than English and German, normally French; (3) a master's oral examination, unless the student already has an A.M. upon entering the program; (4) a qualifying paper; (5) a qualifying examination; (6) the University oral examination; and (7) a dissertation. Students in Medieval Studies must also have a reading knowledge of Latin.

The first year of work, which leads to the A.M. degree, is designed to introduce each student to the three major areas of study. During Spring Quarter of the first year, all students, except those admitted with a master's degree, must take an oral A.M. examination. During the one-hour examination, the student is questioned by three examiners, chosen by the student, on work undertaken in specific graduate courses.

By July 1 of the summer following the first year of graduate study, students should present a qualifying paper an example of their course work. Although ordinarily not meant to represent an original contribu-
tation to scholarship, it should demonstrate the candidate’s ability to grasp complex subject matter with sufficient competence to organize materials and to present arguments in a clear and concise manner commensurate with scholarly standards. The paper is submitted to the department chair, who passes it on for approval by the student’s faculty adviser and a second reader appointed by the chair in consultation with the adviser.

Students who enter the program with a master’s degree from another institution must submit, in lieu of a qualifying paper, a master’s thesis or a major research paper as evidence of ability to pursue advanced scholarly work.

At the end of the sixth quarter of study (and only if the qualifying paper has been accepted), the student takes a one-hour oral qualifying exam with two examiners, the student’s chosen adviser, and another faculty member appointed by the chair. The purpose of this examination is to demonstrate a broad familiarity with the literature of the major periods, movements, and some major figures. Only after successful completion of the qualifying procedure will the department approve the student’s admission to candidacy. A student who fails the qualifying examination may retake it once at the beginning of the seventh quarter.

The University oral examination in the Department of German Studies consists of an oral examination; in consultation with the four prospective examiners, the student prepares a specialized list of relevant literature from an area of concentration, as well as appropriate secondary literature. The area of concentration is considerably broader than a dissertation topic but nevertheless allows for intensive work. Examples of areas of acceptable scope are: a 100-year period with some thematic emphasis, problems emerging from a particular genre in various contexts, a major literary movement, institutional setting, or discursive structure.

At least two weeks before the examination date, the student distributes the definitive version of the bibliography as well as a position paper, approximately 25 pages in length, addressing a major issue in the area of study. The examination consists of questions regarding this paper and the area of bibliography. The examination lasts at least two hours, permitting each of the four examiners a 30-minute question period and reserving an optional 10 minutes for questions from the chair of the examination.

Within three months of successful completion of the University oral, the student must submit a dissertation proposal to the department, approved by all members of the reading committee. The topic of the dissertation normally is directly related to the area of concentration in the University oral.

Students, regardless of their future fields of concentration, are expected to acquire excellence in German and thorough knowledge of the grammatical structure of German. The department expects Ph.D. candidates to demonstrate teaching proficiency in German; 200, Learning of German, is required. The teaching requirement is six quarters during the second and third years of study.

The department expects candidates to demonstrate research skills appropriate to their special areas of study. The requirement can be fulfilled in the capacity of either a University Fellow or a Research Assistant.

Graduate students are also advised to start developing skills in the teaching of literature by participating in the teaching of undergraduate literature courses. Students can earn up to 3 units of graduate credit for practice teaching in literature.

INTERDISCIPLINARY PROGRAMS

The department participates in the Graduate Program in Humanities leading to a joint Ph.D. degree in German Studies and Humanities. For a description of that program, see the "Interdisciplinary Studies in Humanities" section of this bulletin.

Students may work toward a Ph.D. in German Studies with minors in such areas as comparative literature, modern thought and literature, linguistics, or history. Students obtaining a Ph.D. in such combinations may require additional training.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (3 units maximum).

GENERAL

[IN ENGLISH]

These courses do not require knowledge of German and are open to all students.

8A.9A. Myth and Modernity: Culture in Germany—(Enrollment in Introduction to the Humanities 8A, 9A.)
8A. Reason and Revolution—GER:1 (DR:1) (two-quarter sequence)

9A. Rationalization and the Return of Myth—GER:1 (DR:1) (two-quarter sequence)

38A. Introduction to the Germanic Languages—(Same as 138.)
Survey of the oldest attested stages of the Germanic language family, including Gothic, Old Norse, Old Saxon, Old English, Old Frisian, Old Low Franconian (Old Dutch), and Old High German. The linguistic interrelationships, prehistory, Germanic tribal groupings, and written literature (if any). GER:3a (DR:7)

102A. German Words/Jewish Voices—Overview of the cultural and intellectual interaction of Germans and Jews in the modern period. Enlightenment and emancipation; Jews in classical German culture; responses to anti-semitism in literature, philosophy, and religion. Symbiosis or wishful thinking? Interpretations of the Shoah; Jews in postwar Germany. Examination of figures such as Mendelsohn, Varnhagen, the Geiger family, Heine, Cohen, Rosenzweig, Benjamin, Scholem, Kolmar, Celan, etc. Readings and discussion in English. GER:3a (DR:7)

3-5 units, Win (Eshel)

161N. Stanford Introductory Seminar: The Arthurian Legend in Literature and Film—Preference to freshmen. Arthur of Camelot has fascinated poets, artists, writers, and filmmakers. Progress is backwards, engaging first contemporary film and novels, and proceeding to the “roots” of the legend in the early Middle Ages. Students consider how these works “read” Arthur and his milieu, and what they imply about each context. In confronting the persistent “medievalism” of our age, students encounter the complex literature and history of the medieval period. Works by Chrétien, Wolfram, Wace, Malory, Tennyson, Malamud, and others. Films: Excalibur, The Fisher King, Monty Python, and the more obscure Lancelot du Lac, Sword of Lancelot. (In English) GER:3a (DR:7)

3-5 units, Win (Eshel)

163A. Kafka—Introduction and survey of Kafka’s main works, especially stories and novels. His relationship to modernism and tradition, to questions of philosophy and religion. Focus is on questions of writing, alienation, and transcendence. Various critical approaches. Supplementary discussion section for German speakers. GER:3a (DR:7)

3-5 units, Spr (Berman)

166A. Madness and the Artist—From Van Gogh to Kurt Cobain, a line is discerned between creativity and risk, inspiration and delusion, the immensity of genius and the depths of despair. How does this image of the genius reflect the cultural and historical development of a link between madness and artistry? Materials include literary and scientific texts from a variety of historical periods, complemented with films, images from the visual arts, and theoretical writings from a variety of perspectives. Works by Hoffmann, Kleist, Büchner, Charlotte Perkins Gilman, Mann, Rilke, and Jean Rhys.

4 units, Win (Augst)
167N. Stanford Introductory Seminar: German Film to 1945—Preference to freshmen. Watch, discuss, think, and write about German film as a unique art form that expresses and explores cultural identity in the turbulent history of Germany from WWI to the end of WWII. Topics: the birth of sci-fi and horror genres, fascist aesthetics, German-Jewish filmmakers in Hollywood, the impact of German film images and styles on contemporary American film. GER:3a (DR:7) (WIM)
4 units, Aut (Kenkel)

171A. Feminist Media Theories—(Same as 271.) Feminist Anglo-American and European theories of popular culture, including social, political, and psychoanalytic approaches. The critical power and limitations of theories are tested against particular films, soap operas, radio and TV talk shows, romance novels, radio shows, web sites. Topics: how gender difference and inequality are represented and reproduced in different media, the possibility and nature of a female/feminist aesthetic, male and female modes of reception, women's production of popular culture. GER:3a (DR:7)
4 units, Spr (Kenkel)

181A. The Aesthetics of Perception—How may the mind's perception of events and experiences be influenced by literary narrative structures? How is the perception of space determined by aesthetic structures that provide ways of seeing? How aesthetic experience structures perception in everyday life is considered through a study of theoretical, literary, and art historical documents, primarily in the German tradition. Texts by Kant, Kleist, Nietzsche, Freud, Vygotsky, Einstein, Klee, Kandinsky.
4 units, Aut (Pan)

241A,242A,243A.—Open to graduate students, advanced undergraduates, and sophomores with consent of instructor. The history of German thought from 1700 to the present and its significance for understanding modern culture and society. Possible authors: Leibniz, Mendelsohn, Kant, Schiller, Hegel, Marx, Kierkegaard, Nietzsche, Lukács, Husserl, Heidegger, Adorno, Arendt, Habermas, Kluge.
241A. Deutsche Geistesgeschichte I: 18th-Century German Thought—(Same as 241.) Introduction to 18th-century German thought, and to some distinctive problems of modern philosophy and cultural theory. Possible readings: Leibniz, Lessing, Mendelsohn, Kant, and Schiller. Discussions of the concepts of enlightenment and modernity, the politics of theory, the political and epistemological functions of art. (In English)
3-5 units, Aut (Mueller-Vollmer)
242A. Deutsche Geistesgeschichte II: 19th-Century German Thought—(Same as 242.) The works of Hegel, Marx, and Nietzsche; their philosophies of history and their attempts to transcend traditions. The effects of their ideas on 20th-century attempts to break with the past. (In English)
3-5 units, Win (Pan)
243A. Deutsche Geistesgeschichte III: 20th-Century German Thought—(Same as 243.) The legacies of Freud and Marx on 20th-century German thought, with emphasis on feminist reception and critiques. Readings and rhetorical analysis of representative texts from Freud, Luxemburg, Weber, Adorno, Horkheimer, Benjamin, Habermas, Bovenschen, Weigel, Seghers. The schools of thought, e.g., psychoanalysis, Critical Theory, and discourse analysis in conjunction with issues and anxieties relating to technology, fascism, cultural criticism, and gender. (In English)
3-5 units, Spr (Poor)

INTRODUCTORY

Note—Students registering for the first time in a first- or second-year course must take a placement test if they have studied German before entering Stanford.

FIRST-YEAR

1,2,3. German Language and Culture—Comprehensive, balanced introduction to listening, speaking, reading, and writing German. Authentic materials. Interactive approach with emphasis on developing communicative expression. Introduction to the cultural context in which German is spoken.
5 units, Aut, Win, Spr (Staff)

9. Accelerated German—Equivalent to German 1 and 2 combined. For students who want an accelerated start in German language and culture with practice in all four skills. Appropriate for, but not limited to, students intending to study at Stanford in Berlin in Winter Quarter. 8 units, not given 2000-01

5. Intensive First-Year German—Equivalent of 1, 2, and 3 combined. 12 units, Sum (Staff)

10. Elementary German for Seniors and Graduate Students—Intensive, designed for students who need to acquire reading ability in German for the Ph.D. and/or for advanced research in their own field. No auditors. 4 units, not given 2000-01

11P. Individually Programmed Beginning German—For those who wish to complete more or fewer than 5 units a quarter, have scheduling conflicts, or prefer to work independently. Students proceed at their own pace, working on their own with the text and tapes. The instructor is available for consultation on a regular basis. Three unit minimum for beginners. Conversational practice available for additional unit. 1-12 units, Aut, Win (Strachota) Spr (Petig)

HAUS MITTELEUROPA

20A. Beginning Conversation—(AU)
1 unit, Aut, Win, Spr (Staff)

20B. Intermediate Conversation—(AU)
1 unit, Aut, Win, Spr (Staff)

20C. Advanced Conversation—(AU)
1 unit, Aut, Win, Spr (Staff)

20F. Everyday Life during WW II—(AU)
1 unit, Spr (Staff)

20K. Küche Mitt (German Cooking Class)—(AU)
1 unit, Aut (Staff)

20M. "Mitt" Movie Series—(AU)
1 unit, Aut, Win, Spr (Staff)

20N. German Music—(AU)
1 unit, Spr (Staff)

20P. Germany Today—(AU)
1 unit, Aut (Staff)

20Q. German Drama—(AU)
1 unit, Win (Staff)

20S. Speaking German "Mitt"—(AU)
1 unit, Win (Staff)

20T. Teaching German Conversation—(AU)
1 unit, Aut, Win, Spr (Staff)

Other in-house courses may be announced.

INTERMEDIATE

At this level, students have several options depending on their interests. After completing German 3 or the equivalent, students may enroll directly in courses on the 120-level, which consider special topics in German culture while encouraging additional language learning. Alter—

- 3-4 units, not given 2000-01

21W. Intermediate German II—Continuation of 21, with greater emphasis on reading and writing skills. Literary texts of major 20th-century writers in their historical context.

- 4 units, not given 2000-01

22W. Intermediate German II: German for Business and International Relations—Equivalent to 22, but continuation of 21W. Recommended for students planning to do a business internship in a German-speaking country. Prerequisite: 21 or 21W.

- 4 units, Win (Petig)

100. One Hundred German Years—Hones German language skills while introducing the history and culture of Germany as experienced by ordinary people in the 20th century. Themes: Germans and war, democracy, work, family, religion, sex, humor, sports, etc. Viewing of the Deutsche Welle video series with discussion, readings, Internet links. Final oral presentation.

- 3-4 units, not given 2000-2001


- 4 units, Aut (Staff)

105. Advanced Business German—Recommended for students planning to work in a German-speaking country, and for preparation of the International Business German exams. Case studies of typical business situations in German with accompanying videos, listening comprehension exercises, and class simulations. Business correspondence and reports in German. Prerequisite: 22 or equivalent.

- 4 units, Spr (Petig)

110. German Newspapers—For intermediate and advanced students. Read/discuss three articles a week from current newspapers and magazines. Reading comprehension strategies, with on-line news updates. Vocabulary enhancement. Contemporary issues. Writing practice if desired.

- 3-4 units, Aut (Staff)

111. Television News from Germany—For intermediate and advanced students. Viewing of current news reports and features. Emphasis is on building listening comprehension. Writing practice if desired. Discussion in German.

- 3-4 units, Spr (Strachota)

121. Pop Culture in Contemporary Germany—Excellent preparation for study abroad in Berlin. Trends in German popular culture from the 90s to the present. (Theme varies.) Reading materials from newspapers, magazines, comics, web, plus one or two contemporary novels. Weekly video and film viewings (outside class) include TV talk shows, soaps, detective shows, and new German comedy films. Web research, news, group, oral presentations, and 4-5 short papers. GER:3a (DR:7)

- 4 units, Win (Poor)

123N. Stanford Introductory Seminar: The Brothers Grimm and their Fairy Tales—Preference to freshmen. A historical, biographical, linguistic, and literary look at the famous Kinder- und Hausmaerchen of Jacob and Wilhelm Grimm. Readings from the fairy tales, plus materials in other media (film and the visual arts). Small-group performances of dramatized fairy tales. (InGerman) Prerequisite: 3 or equivalent. GER:3a (DR:7) (WIM)

- 4 units, Spr (Robinson)

126Q. Stanford Introductory Seminar: Reading German Literature—An Introduction—Preference to sophomores. The fundamental skills and concepts needed to read literature in German, strengthening language skills with an introduction to the central questions of literary study: how to interpret a text, the relationship between an author's intention and a reader's interest. Why does the literature of another age and another country continue to interest us and how does this distance influence our judgments? Authors: Luther, Goethe, Heine, Rilke, Kafka, and Brecht. Conducted primarily in German with short writing assignments. Prerequisite: 3 or equivalent. GER:3a (DR:7) (WIM)

- 4 units, Aut (Berman)

128. The Beauty of Evil: Art and Morality in German Modernism—If Nazi Germany has captured our imagination as the embodiment of evil, what can one say about the art which led up to and/or supported it? Can beauty be evil? Can the good be ugly? Texts and images by Baudelaire, Benn, Kafka, Mann, Rilke, Jünger, Bataille, Brecht, and Riefenstahl. Study the relationship between art and morality in the early 20th century. Primarily in German, with short writing assignments. Prerequisite: 3 or equivalent. (WIM)

- 4 units, Win (Pan)

131-133. German literature and culture from the 18th century to present. Topics vary each year and courses may be repeated with consent of the instructor. Readings in German.

132. 19th-Century Literature and Culture: Romanticism—Responses to the Enlightenment and the French Revolution; the aesthetic discourse of the "sublime;" women and romanticism. Redefinitions of identity and emancipation. Romantic philosophy and evaluations of art and music. Authors: Goethe, Hölderlin, Novalis, Hoffmann, Schlegel, Heine, etc. GER:3a (DR:7)

- 4 units, Aut (Eshel)

132K. 19th-Century Literature and Culture: Heinrich von Kleist—In his rejection of the idea that philosophical truth is universally and objectively valid, Kleist embarks on a search for an aesthetic basis of truth and morality. This leads him to an early postcolonialist vision of culture and a critique of bourgeois gender and family relations. From his "Kant crisis" to suicide in 1812, the development of Kleist's anti-Enlightenment aesthetic in his stories, essays, and dramas.

- 4 units, Spr (Pan)

133. 20th-Century Literature and Culture: German Modernism—Introduction to 20th-century Modernisms in poetry, epigram, novella, short story, film. How writers/artists synthesize, interpret, and respond to war, technological revolution, industrialization and urbanization, and the rise of mass media. A questioning of Enlightenment values of reason and communication in aesthetic form and content, the crisis of individual expression, aesthetic autonomy vs. politically engaged art, the collapse of community and the search for new community, technology and art. Authors/artists: Nietzsche, Kafka, Freud, Brecht, Mann, Lasker-Schüler, Trakl, Heym, Lang, Riefenstahl. GER:3a (DR:7)

- 4 units, Win (Kenkel)

134P. Medieval Women—The place, participation, and images of women in medieval culture, emphasizing German-speaking contexts.
Prominent historical women (e.g., Königin Mathilde), images of women in
medieval poetry (Minnesang), romance (Hartmann von Aue’s Erec,
Gottfried’s Tristan), and texts authored by women (writings of women
mystics). Modern conceptions of medieval women in film. Primary texts
in German, some secondary material in English. Discussion in German
and English. GER:3a, 4c (DR:7+)
4 units, Win (Poor)

158. German Dialects—(Same as 258.) Introduction to the major
German dialects using native speakers, professionally-made tapes (with
transcripts), and secondary readings. Identification of the most salient
linguistic characteristics of the various dialect areas. Survey of the
history of the study of language variation in Germany: traditional dialect-
grammers, dialect-geographical revolution, the insights of modern so-
ciolinguistics. GER:3a (DR:7)
3 units, Win (Robinson)

163. Kafka—(Same as 163A, plus supplemental reading in German.)
3-5 units, Spr (German)

188. Modern German Poetry—(Same as 288.) German poetry during
the 20th century: symbolism and exile, responses to the Shoah, post-war
existentialism, post-modernism. Poetic theories of Benn and Adorno.
Close readings of poems by, e.g., George, Rilke, Benn, Brecht, Bach-
mann, Celan, Enzensberger, Kirsch, Grünbein, etc. GER:3a (DR:7)
3-5 units, Win (Eshel)

194. German Studies Colloquia—Stanford faculty, students, and vis-
ting scholars present and discuss their works in German Studies and
related fields.
1 unit, Aut, Win, Spr (Staff)

199. Individual Reading—36 hours of reading per unit, weekly confer-
ence with instructor. May be repeated for credit. Prerequisite: consent of
instructor.
1-2 units, Aut, Win, Spr (Staff)

ADVANCED UNDERGRADUATE AND GRADUATE

200. The Teaching of Second Language Literatures—(Same as Lan-
guage Center 200.) Focus is on literacy development in a second
language, emphasizing literary texts, and assessing the learners’ second-
language linguistic level and requisite background knowledge with
regard to particular literary texts. Instructional strategies and feedback
techniques for written and oral work.
3-5 units, Spr (Bernhardt)

203. History of the German Language—The historical background of
the modern German language. Emphasis is on the explanation of certain
phonological, morphological, and syntactic peculiarities in the modern
language by reference to earlier stages of the language, from Proto-Indo-
European to the immediate past. Introduction to the principles of histori-
cal linguistics.
4 units, not given 2000-01

231-239. German Literature and Culture—The major periods of
German Literature from the early Middle Ages to the present. Undergradu-
ate prerequisite: consent of instructor.

234B. Literary and Philosophical Revolutions around 1800—The
critical commonplace suggests the Germans had their revolution only
in spirit or in thought, a sign of German political backwardness, of the
Deutsche misère. It may be that German literary and philosophical
“revolutions” just preceding and directly following 1789 were not so
much expressions of, or even simple reactions to, the political back-
wardness of the Germans, but instead enacted a distinctive literary-
philosophical politics, sometimes explicit, sometimes coded. Read-
ings: Heine, Goethe, Schiller, Wieland, Friedrich Schlegel, Novalis.
(In German) Prerequisite: consent of instructor.
3-4 units, not given 2000-01

2361. Weimar Republic—The relationship between literature and
democracy during the 1920s. The impact of military defeat and revo-
lation on the restructuring of the institutions of cultural life. Problems
of nationhood and popularity; the tensions between engagement and
tradition; literature and film; representations of war.
3-5 units, not given 2000-01

241-243. The history of German thought from 1750 to the present and its
significance for an understanding of modern culture. Authors: Lessing,
Herder, Kant, Schiller, Hegel, Marx, Nietzsche, Lukács, Husserl, Heideg-
ger, Adorno, Habermas.

241. Deutsche Geistesgeschichte I: 18th-Century German
Thought—(Same as 241A.)
3-5 units, Aut (Mueller-Vollmer)

242. Deutsche Geistesgeschichte II: 19th-Century German
Thought—(Same as 242A.)
3-5 units, Win (Pan)

243. Geistesgeschichte III: 20th-Century German Thought—
(Same as 243A.)
3-5 units, Spr (Poor)

255. Middle High German—Introduction to medieval German lan-
guage and culture. Selections from various authors (e.g., Hartmann von
Aue, Gottfried von Strassburg) and genres (e.g., Minnesang, epic,
romance). Grammar is reviewed and elucidated; emphasis is on rapid and
accurate reading.
3-5 units, not given 2000-01

257. Gothic—Introduction to the grammar, texts, and history of this
earliest extensively-documented Germanic language, a relative of the
German and the English languages. Issues surrounding the Germanic
parent language (the ancestor to them all).
4 units, Aut (Robinson)

258. German Dialects—(Same as 158.)
3 units, Win (Robinson)

271. Feminist Media Theories—(Same as 171A.)
4 units, Spr (Kenkel)

276. Primitivism in Early 20th-Century Europe—The rise of a
primitivist aesthetic in early 20th-century German and French art and
literature. Beginning with Nietzsche and Gaugin and surveying develop-
ments in literature and art, shows how the European interest in the art of
“primitive” cultures defined the European aesthetic movements such as
Expressionism and Surrealism. Texts by Nolde, Pechstein, Kandinsky,
Marc, Picasso, Einstein, Freud, Kafka, Artaud, and Bataille; stories and
sculptures from the Tsonga in Mozambique and the Ngumba in Came-
roon.
3-5 units, Aut (Pan)

279. Naturalism—The Naturalist movement as the first of Modernism’s
aesthetic revolutions. Lyric poetry, the “Berlin-novel,” novellas, plays,
and cultural theory. The influence of scientific and industrial advances on
cultural form and content, and on conceptions of identity (gender, class).
Topics: technology and gender, collectivity vs. individuality, the decline of
the Enlightenment “hero,” the human costs of modernization, themes
and structures of mimetic style. Authors: Hauptmann, Viebig, Schlaf,
Holz, Kretzer, Wedekind, Lukács.
4 units, Win (Kenkel)

281. Tragedy and the Modern Subject—Since the Enlightenment.
Greek tragedy has captivated German artists and intellectuals, and
played an integral role in their conceptualizations of subjectivity, com-
munity, sexuality, and religion. Seminar traces the progressions of
thought initiated by tragic theory and practice from the 18th to the 20th
centuries, focusing on the reception and revision of Antigone, Medea,
and Oedipus Tyrannus in various contexts from ethics to religious

4 units, Spr (Augst)

288. Modern German Poetry—(Same as 188.)
3-5 units, Win (Eshel)

298. Individual Work—Open only to German majors and to students working on special projects, including written reports for internships. Honors students use this number for the honors essay. May be repeated for credit.
1-15 units each quarter (Staff)

300. Methods and Materials for German Studies—Techniques and library resources for investigating German literature and culture, particularly in its historical dimensions. Readings/assignments on the multiple aspects of the production of texts in historical context, emphasizing the location and interpretation of relevant cultural, economic, social, and literary sources. Bibliography; non-canonical and extra-literary sources; film and other non-print media; archives and special collections.
3-5 units, not given 2000-01

ADVANCED GRADUATE

400. Dissertation Research—Exclusively for graduate students in German working on dissertations.
1-12 units, Aut, Win, Spr, Sum (Staff)

AFFILIATED DEPARTMENT OFFERINGS

COMPARATIVE LITERATURE

115Q. Stanford Introductory Seminar: Thinking in the Present—Discussions about 20th-Century European Philosophy
3 units, Aut (Gumbrecht)

180/280. The 19th-Century Novel
5 units, Win (White)

300. The Theory of the Text
5 units, Win (White)

369E. The Disciplines of Literature
5 units, Aut (Schnapp, Gumbrecht)

MODERN THOUGHT AND LITERATURE

190W. Humanism, Anti-Humanism, Posthumanism
5 units, Spr (Weinstone)

MUSIC

17N. Stanford Introductory Seminar: The Operas of Mozart
3 units, Win (K. Berger)

PHILOSOPHY

126/226. Kant’s Ethics
4 units, Win (Wood)

223. Fichte’s Theory of Personality
3 units, Spr (Wood)

275. Marx and Weber
3 units, Win (Satz)

OVERSEAS STUDIES

These courses are approved for the German major and taught at the campus indicated. Students should discuss with their major advisers which courses would best meet educational needs. Course descriptions can be found in the “Overseas Studies” section of this bulletin or in the Overseas Studies Program office, 126 Sweet Hall.

397
History courses teach the foundational knowledge and skills (analytical, interpretive, writing) necessary for understanding the deep connections between past and present. History is a pragmatic discipline in which the analysis of change over time involves sifting the multiple influences and perspectives that affect the course of events, as well as evaluating critically the different forms of evidence historians exploit to make sense of them. Teaching students how to weigh these sources and convert the findings into a persuasive analysis lies at the heart of the department’s teaching. Graduates with a history major pursue careers and graduate study in law, public service, business, writing, and education. Further information on the department, its programs, and faculty can be found at http://www.stanford.edu/dept/history.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The Department of History offers four pathways to the A.B. in History. The “General Major” emphasizes breadth of study among historical areas and periods as well as concentration in one selected field. The three “Majors with Interdisciplinary Emphasis” (Literature and the Arts, Social Science, Science) combine the study of history with the methods and approaches of other disciplines, and involve substantial course work outside of History.

All History majors require the following:

1. Completion of twelve courses of at least 3 units each, to include:
   a) One Sources and Methods seminar
   b) Two 200-level undergraduate colloquia
   c) At least one other small-group course, to be chosen among the department’s undergraduate colloquia, research seminars, or Stanford Introductory Seminars taught by History faculty members

2. All twelve courses must be taken for a letter grade, and the student must maintain a grade point average (GPA) in History courses of ‘C’ or higher.

3. At least six courses must be taken from regular members of the Department of History.

4. History’s Writing-in-the-Major requirement is satisfied by completing one of the following: a WIM-option colloquium or seminar; an Honors thesis in History; or a 15-page research paper in History written under faculty direction. Work on the research paper must begin no later than Winter Quarter of the senior year (at least two quarters prior to graduation).

5. At least six quarters of enrollment in the major. Each candidate for the A.B. in History should declare a major by the Autumn Quarter of the third year of study (earlier, if possible).

One Directed Reading (200W) or Directed Research (200X) taken for 3-5 units and for a letter grade may be applied toward the twelve courses required for the A.B. The maximum of five transfer courses may be applied toward the major. Advanced placement credits do not fulfill any major requirements.

Completion of the major requires planning. In Spring Quarter of the junior year, following consultation with faculty advisers, History majors are required to complete a departmental Degree Progress Review and submit it to the History office.

The department also strongly encourages students to acquire proficiency in foreign languages and study at one of Stanford’s overseas centers. Such studies are not only valuable in themselves; they can provide an opportunity for independent research and a foundation for honors essays and graduate study.

For information on specific History courses’ satisfaction of major requirements, refer to the Department of History course information website: http://history-db.stanford.edu/coursefinder.php3.

THE GENERAL HISTORY MAJOR

In pursuing the above requirements for all History majors, the student in the General History major is required to satisfy breadth and concentration requirements.

1. Breadth: to ensure chronological and geographical breadth, at least two courses must be completed in a “premodern” chronological period and in each of three geographical fields: Field I (Africa, Asia, and Middle East); Field II (the Americas); and Field III (Europe, including Western Europe, Eastern Europe, and Russia). Courses fulfilling the “premodern” chronological period may also count for Fields I-III.

2. Concentration: to develop some measure of expertise, students must complete four courses in one of the following fields of concentration: Africa, Asia, Eastern Europe and Russia, Europe before 1700, Europe since 1700, Jewish history, Latin America, science and technology, the United States, the Middle East, Comparative Empires and Cultures; or a thematic subject treated comparatively, such as war and revolution, work, gender, family history, popular culture/high culture, and so on. The proposed concentration must be approved by the major adviser; a proposal for a thematic concentration must have the approval of both the adviser and the department’s Undergraduate Studies Committee. At least one and preferably two of these four courses should be an undergraduate colloquium or seminar.

Certain Introduction to the Humanities courses taught by History faculty in a Winter-Spring sequence count toward the General History major.

HISTORY MAJORS WITH INTERDISCIPLINARY EMPHASIS (HMIE)

These majors are designed for several types of students: students interested in other disciplines who wish to focus on the historical aspects of the subject matter covered by that discipline; students in History who wish to understand how interdisciplinary approaches can deepen their understanding of history; and students primarily interested in developing interdisciplinary approaches to historical scholarship by combining the careful attention to evidence and context that motivates historical research with the analytic and methodological tools of science, humanities, and social science. In pursuing the above requirements for all History majors, students in HMIE are required to complete their twelve courses for the major as follows:

Gateway Course (one course)—Students are required to take the appropriate gateway course for their interdisciplinary major. This introduces students into the application of particular interdisciplinary methods to the study of history. See the section on each HMIE for the gateway course appropriate to that major.

Methodological Cluster (three courses)—This cluster is designed to acquaint students with the ways in which interdisciplinary methods are employed in historical scholarship, both by practicing historians and by scholars in other disciplines whose work is historical. This program of study must provide methodological coherence and must be approved in advance by the student’s adviser. See the section on each HMIE for appropriate interdisciplinary courses.

Geographic Cluster (four courses)—History is embedded in time and place. This cluster is designed to emphasize that the purpose of studying methodology is to more fully understand the history of a particular region of the world. Students select a particular geographic region, as specified in the History major, and complete four courses in that area.

Interdisciplinary Cluster (four courses)—These courses, taken outside the Department of History, acquaint students with the methods and approaches of another discipline appropriate for the interdisciplinary study of history. This program of study must provide methodological coherence and must be approved in advance by the student’s adviser. See the section on each HMIE for appropriate interdisciplinary courses.

HMIE majors do not mandate the breadth or concentration requirements of the General History major. Introduction to the Humanities courses taught by History faculty may apply to HMIEs only insofar as their content is specifically appropriate to the particular methodological or geographic cluster. Courses preapproved for the clusters in Interdisciplinary tracks are listed on the History advising website.
The History, Literature, and the Arts major is designed for the student who wishes to complement his or her work in history with study in literature, particularly in a foreign language. For the purposes of this major, literature is defined broadly, including art, drama, films and poetry, memoirs and autobiography, novels, as well as canonical works of philosophy and political science. It appeals to students who are interested in studying literature primarily in its historical context, or who want to focus on both the literature and history of a specific geographical area while also learning the language of that area.

Gateway Course—History 204, History, Literature, and Arts, gives students a broad introduction to the study of literary texts in history.

Methodological Cluster—This cluster teaches students how historians, in particular, analyze literary texts as documentary sources. Students choose three courses from among the preapproved HLA Methodology curriculum; other courses must be approved by the HLA coordinator. These courses need not be in the student’s geographic concentration.

Geographic Cluster—Students select four History courses in one geographic area. Examples include: Europe, Britain and the countries of the former British Empire, Asia, North America, Latin America, the Middle East, or Africa. These four courses must be taken in addition to the three methodological courses required above.

Interdisciplinary Cluster—Four courses, taken outside the Department of History, must address the literature and arts, broadly defined, of the area chosen for the geographic concentration. The student’s adviser must pre-approve all courses in this cluster; these courses may not be double-counted towards a minor or major other than History.

HISTORY AND SOCIAL SCIENCE

Gateway Course—History 206, The Logic of History, focuses on the way that historians sustain arguments on the basis of logical models and documentary evidence. It is divided into two modules: the first focuses on readings in the philosophy of history and causal model building, the second focuses on the reading of a wide variety of historical scholarship in order to allow students to identify particular kinds of confirmatory logics in a practical sense.

Methodological Cluster—These History courses employ social scientific methods to address historical questions. The choice of courses depends on the student’s particular methodological and substantive interests, and must be selected from courses preapproved for this cluster or approved in advance by the faculty advisor.

Geographic Cluster—Students select four History courses in one geographic area. Examples include: Europe, Britain and the countries of the former British Empire, Asia, North America, Latin America, the Middle East, or Africa. These four courses must be taken in addition to the three methodological courses required above.

Interdisciplinary Cluster—Students must define an interdisciplinary methodological cluster with the approval of their adviser. This cluster must constitute a coherent curriculum of tools oriented courses in the departments of Classics, Economics, Political Science, or Sociology. The cluster requirement may be fulfilled in either of two ways: by taking four courses in a single department; or by taking four courses that are built around a particular set of approaches in multiple departments. An example of the former might be a curriculum that allows a student to become acquainted with the methods and approaches of political science to the study of political history (what is often called “new political history”). Such a curriculum might include courses in the Department of Political Science on quantitate methods (Political Science 100A and 100B) along with courses in the historical analysis of American Politics. An example of the latter might be a focus on economic history, in which a student took American economic history, European economic history, and history of technological change in the Department of Economics, along with the ancient economy in the Department of Classics. In either case, the program of study must be approved in advance by the student’s adviser. Courses in this cluster may not be double-counted towards a minor or major other than History.

HISTORY AND SCIENCE

History and Science is a collaborative program of the Department of History and the Program in the History and Philosophy of Science. The major is designed for the science student who wishes to complement his or her work in science with a History major that focuses explicitly on science; students in the humanities and social sciences whose interest in science is primarily historical and contextual; and students contemplating medical school who are interested in a History major that allows them to study the history of medicine, biology, and allied sciences in conjunction with fulfilling the premed science requirements that give them a general grounding in science.

Gateway Course—206P, Many Histories of Science, is designed to introduce students to approaches and methods in the history of science, technology, and medicine. It is primarily concerned with definitions of scientific methodology, practice, and institutions, and exposes students to some of the fundamental debates in the history of science. Case studies vary depending upon the particular instructor.

Methodological Cluster—These History courses focus on the history of science, technology, and medicine. Courses must be approved by the student’s adviser. The choice of courses depends on the student’s particular interests (for example, premodern science, history of medicine and biology, history of technology, contemporary science).

Geographic Cluster—Students select four History courses in one geographic area. Examples include: Europe, Britain and the countries of the former British Empire, Asia, North America, Latin America, the Middle East or Africa. These four courses must be taken in addition to the three methodological courses required above. Courses in the history of science, technology, and medicine that have a geographic focus may be used to fulfill this requirement, but cannot be double-counted in the methodological cluster.

Interdisciplinary Cluster—This four-course cluster can be defined in any of three ways: (1) a disciplinary concentration that entails taking four courses in a single scientific discipline; (2) an interdisciplinary concentration that entails taking two anthropology of science, philosophy of science, or sociology of science courses, and two complementary science courses; or (3) a general science concentration, designed primarily for students contemplating medical school, in order to complement courses in the history of science and medicine with a broad background in the sciences. In all instances, the concentration must be approved in advance by the student’s adviser. In addition to the usual science courses, students may also design concentrations in anthropology and computer science.

MINORS

Candidates for the minor in History must complete six courses, at least three of which must have a field or thematic focus. The department ordinarily defines fields in terms of geography or chronology, but it also invites students to pursue thematic topics that can be examined in broadly comparative terms. Students completing the minor may choose to concentrate in such fields as African, American, British, Asian, European (medieval, early modern, or modern), Russian and East European history, comparative empires and cultures, or such thematic topics as the history of gender, the family, religion, technology, or revolution. Students may also petition to have a concentration of their own design count toward the minor.

All six courses must be of at least 3 units each and must be taken for a letter grade. The student must maintain a grade point average (GPA) in History courses of "C" or higher. Two of the six courses must be small-group in format (Stanford Introductory Seminars taught by History faculty, Sources and Methods Seminars, departmental colloquia and research seminars). History courses taken at overseas campuses may count toward the minor, but at least three of the six courses must be taken from Stanford faculty. One History course from Introduction to the Humanities may count toward the six-course requirement, but not for the field
concentration. A maximum of three transfer courses may be used toward the minor. Advanced placement credits do not fulfill any minor requirements.

Students must declare the minor in History no later than the Autumn Quarter of the senior year. They do so through Axess under “Minor Declarations.” Minor declarations are then approved by the Department of History and confirmation is sent via email to the student.

HONORS PROGRAM

For a limited number of majors, the department offers a special program leading to honors in History. Students accepted for this program, in addition to fulfilling the general requirements stated above, begin work on an essay in Spring Quarter of the junior year and complete the essay by mid-May of the senior year. In addition to the Junior Honors Colloquium, 200H, students normally take 11 to 15 units of Senior Research, to be distributed as best fits their specific project. For students in the honors program, Senior Research units (200A,B,C) are taken in addition to the twelve required courses in History.

To enter this program, the student must be accepted by a member of the department who agrees to advise the research and writing of the essay, and must complete the Junior Honors Colloquium (200H). An exception to the latter requirement may be made for those studying overseas Spring Quarter of the junior year. but such students should consult with the director of the honors program, if possible, prior to going overseas. Under exceptional circumstances, students are admitted to the program in the Autumn Quarter of the senior year.

In considering an applicant for such a project, the adviser and director of the honors program take into account general preparation in the field of the project and expect a GPA of at least ‘B+’ in the student’s previous work in history and in the University. Students completing the thesis with a grade of ‘B+’ or higher are eligible for honors in History. To enter the honors program, apply at the Department of History office.

Outstanding honors essays may be considered for the University’s Golden Medals, as well as for departmental James Birdsall Weter prizes.

SECONDARY (HISTORY) TEACHER’S CREDENTIAL

Applicants for the Single Subject Teaching Credential (Secondary) in the social studies may obtain information regarding from the Credential Administrator, School of Education.

COTERMINAL A.B. AND A.M. PROGRAM

The department each year admits a limited number of undergraduates to work for coterminal A.B. and A.M. degrees in History. Applications for admission should be submitted by January 31 of the senior year. Applicants must meet the same general standards as those seeking admission to the A.M. program; they must submit a written statement of purpose, a transcript, and three letters of recommendation, at least two of which should be from members of the Department of History faculty. The decision on admission rests with the department faculty upon recommendation by the Graduate Admissions Committee. Students must meet all requirements for both degrees. They must complete 1.5 full-time quarters (or the equivalent), or three full-time quarters after completing 180 units, for a total of 216 units. During the senior year they may, with the consent of the instructors, register for as many as two graduate courses. In the final year of study, they must complete at least three courses that fall within a single Ph.D. field.

GRADUATE PROGRAMS

ADMISSION

Applicants for admission to graduate work must take the General Test of the Graduate Record Examination. It may be taken at most American colleges and in nearly all foreign countries. For details, see the Guide to Graduate Admission, available from Graduate Admissions, the Registrar’s Office.

Students admitted to graduate standing do not automatically become candidates for a graduate degree. With the exception of students in the terminal A.M. program, they are admitted with the expectation that they will be working toward the Ph.D. degree and may become candidates to receive the A.M. degree after completing three quarters of work.

MASTER OF ARTS

University requirements for the A.M. degree are described in the “Graduate Degrees” section of this bulletin.

The department requires the completion of nine courses (totaling not less than 36 units) of graduate work; seven courses of this work must be Department of History courses. Of the seven, one must be a seminar and three must be either graduate colloquia or graduate seminars. Directed reading may be counted for a maximum of 10 units. A candidate whose undergraduate training in history is deemed inadequate must complete nine courses of graduate work in the department. The department does not recognize for credit toward the A.M. degree any work that has not received the grade of 'A,' 'B,' or '+.'

Terminal A.M. Program—Applicants who do not wish to continue beyond the A.M. degree are admitted to this program at the discretion of the faculty in individual fields (U.S., modern Europe, and so on). Students admitted may not apply to enter the Ph.D. program in History during the course of work for the A.M. degree.

A.M. in Teaching (History)—The department cooperates with the School of Education in offering the Master of Arts in Teaching degree. For the general requirements, see the “School of Education” section of this bulletin. For certain additional requirements made by the Department of History, contact the department office. Candidates must possess a teaching credential or relevant teaching experience.

DOCTOR OF PHILOSOPHY

Students planning to work for the doctorate in history should be familiar with the general degree requirements of the University outlined in the “Graduate Degrees” section of this bulletin. Those interested in applying for admission to the A.M. and Ph.D. programs should contact Graduate Admissions, the Registrar’s Office, Old Union, in order to receive an application. Applications become available in September of the year prior to intended enrollment. The application filing deadline is January 1. Applicants must file a report of their general scores on the Graduate Record Examination and submit a writing sample of 10-25 pages on a historical topic. Successful applicants for the A.M. and Ph.D. programs may enter only in Autumn Quarter.

Upon enrollment in the graduate program in History, the student has a member of the department designated as an adviser with whom to plan the Ph.D. program. Much of the first two years of graduate study is spent taking courses, and, from the outset, the student should be aware that the ultimate objective is not merely the completion of courses but preparation for general examinations and for writing a dissertation.

Admission to the Department of History in the graduate division does not establish any rights respecting candidacy for an advanced degree. At the end of the first year of graduate study, students are evaluated by the faculty and given a progress report. A decision as to whether she or he will be admitted to candidacy for the Ph.D. is normally made by the middle of the student’s third year.

After the completion of certain further requirements, students must apply for acceptance for candidacy for the doctorate in the graduate division of the University.

REQUIREMENTS

1. In consultation with the adviser, students select an area of study from the list below in which to concentrate their study and later take the University oral examination. The major concentrations are:

   Europe, 300-1400
   Europe, 1400-1789
   Europe since 1700
   Jewish History
   Russia
   Eastern Europe
   Middle East
   East Asia before 1600
5. Each student, before conferral of the Ph.D., is required to satisfy the department’s teaching requirement.

6. There is no University or department foreign language requirement for the Ph.D. degree. A reading knowledge of one or more foreign languages is required in concentrations where appropriate. The faculty in the major concentration prescribes the necessary languages. In no concentration is a student required to take examinations in more than two foreign languages. Certification of competence in commonly taught languages (that is, French, German, Latin, Portuguese, Russian, and Spanish) for candidates seeking to fulfill the language requirement in this fashion is done by the appropriate language department of the University. Certification of competence in other languages is determined in a manner decided on by faculty in the major concentration. In either case, certification of language competence must be accomplished before a student takes the University oral examination.

7. The student is expected to take the University oral examination in the major concentration early in the third graduate year.

8. The student must complete and submit a dissertation which is the result of independent work and is a contribution to knowledge. It should evidence the command of approved techniques of research, ability to organize findings, and competence in expression. For details and procedural information, inquire in the department.

JOINT Ph.D. IN HISTORY AND HUMANITIES

The Department of History participates in the Graduate Program in Humanities leading to a joint Ph.D. degree in History and Humanities. See the “Interdisciplinary Studies in Humanities” section of this bulletin.

RESOURCES

The above section relates to formal requirements, but the success of a student’s graduate program depends in large part on the quality of the guidance which he or she receives from the faculty and on the library resources available. Prospective graduate applicants are advised to study closely the list of History faculty and the courses this faculty offers. As to library resources, no detailed statement is possible in this bulletin, but areas in which library resources are unusually strong are described below.

The University Library maintains strong general collections in almost all fields of history. It has a very large microtext collection, including, for instance, all items listed in Charles Evans’ *American Bibliography*, and in the *Short-Title Catalogues* of English publications, 1474-1700, and virtually complete microfilmed documents of the Department of State to 1906. It also has a number of valuable special collections including the Borel Collection on the History of California; many rare items on early American and early modern European history; the Brasch Collection on Sir Isaac Newton and scientific thought during his time; the Gimon Collection on French political economy, and other such materials.

The rich, and in some respects unique, collection of the Hoover Institution on the causes, conduct, and results of WWI and WWII are being augmented for the post-1945 period. The materials include government documents, newspaper and serial files, and organization and party publications (especially the British and German Socialist parties). There are also important manuscript collections, including unpublished records of the Paris Peace Conference of 1919 and the Herbert Hoover archives, which contain the records of the Commission for Relief in Belgium, the American Relief Administration, the various technical commissions established at the close of WWI for reconstruction in Central and Eastern Europe, the personal papers of Herbert Hoover as United States Food Administrator, and other important personal papers. Other materials for the period since 1914 relate to revolutions and political ideologies of international importance; colonial and minority problems; propaganda and public opinion; military occupation; peace plans and movements; international relations; international organizations and administration including the publications of the United Nations, as well as principal international conferences. The Hoover Institution also possesses some of the richest collections available anywhere on the British labor movement; Eastern Europe, including the Soviet Union; East Asia (runs of important newspapers and serials and extensive documentary collections, especially for the period of WW II); and Africa since 1860, especially French-speaking Africa, the former British colonies, and South Africa.
FINANCIAL SUPPORT

Students who are admitted with financial support are provided multiple years of support through fellowship, teaching and research assistantships, and tuition grants. Applicants should indicate on the admissions application whether they wish to be considered for such support. No separate application for financial aid is required.

U.S. citizens and permanent residents who are interested in area language studies in East Asia, Latin America, Africa, and the republics of the former Soviet Union may request a Foreign Language and Area Studies (FLAS) fellowship application from:

FLAS Coordinator
(650) 723-0564
FLAS application deadline: mid-January

COURSES

See the Time Schedule for changes in course offerings each quarter, and check the web at http://www-portfolio.stanford.edu for updated information.

INTRODUCTORY UNDERGRADUATE

STANFORD INTRODUCTORY SEMINARS

Refer to the Time Schedule or contact the Stanford Introductory Studies office (123 Sweet Hall, telephone 650-723-4504) for applications and information.

18N. Stanford Introductory Seminar: Confronting Islam—The United States in the Middle East since 1967—Preference to freshmen. GER:3b (DR:9)
4 units, Aut (Beininn)

19N. Stanford Introductory Seminar: Peter the Great—The Individual Shaping History, History Shaping the Individual—Preference to freshmen. Praised by his subjects for rescuing Russia from the alleged backwardness of the medieval past, Peter the Great became the subject of a powerful, yet contested, myth. Focusing on primary sources from the 17th to the 19th century (speeches, laws, travelers' accounts, literature, and art), emphasis is on the myth of the "Great Reformer," its makers and detractors, and its many variations. GER:3a (DR:7)
4 units, Win (Kollmann)

24N. Stanford Introductory Seminar: World War II—Preference to freshmen. 5 units, Spr (Weiner)

36N. Stanford Introductory Seminar: Gay Autobiography—Preference to freshmen. The issues of gender, identity, and solidarity as represented in nine autobiographies: Isherwood, Ackerley, Duberman, Monette, Louganis, Barbin, Cammermeyer, Gingrich, and Lorde. To what degree do these writers come to view their sexual orientation as a defining feature of their selves? Is there a difference between the way men and women view the issue of identity? What kind of politics follow from these writers' experiences? GER:3a,4c (DR:7)
4 units, Aut (Robinson)

41N. Stanford Introductory Seminar: Race, Sex and Class—England and the Empire, An Exploration through Novels—Preference to freshmen. Readings of works of fiction; what the British Empire meant for the British themselves and for those who were within the Empire. Conrad's Heart of Darkness, Kipling's Kim, Forster's A Passage to India, Orwell's Burmese Days, Porter's The Lion's Share, and works by Indian authors as they react to the experience of being part of the Empire. GER:3a (DR:7)
4 units (Stan'sky) not given 2000-01

42N. Stanford Introductory Seminar: The Invention of Liberty and the English Revolution, 1640-1660—Preference to freshmen. Between 1640 and 1660, England experienced a civil war and an 11-year period in which it became a republic, ruled not by a hereditary king but by a lord protector. During this revolutionary period, English men and women talked and wrote about freedom and liberty, in terms of the individual and the state and in terms of religion and society. What these writings on what freedom might and should mean, writings which skirted for the first time in premodern Europe what democracy and a democratic republic might entail. GER:3a (DR:7)
4 units, Spr (Seaver)

45N. Stanford Introductory Seminar: The Qur'an and its Interpreters—Preference to freshmen. A historical study of the Qur'an and other allied disciplines. Themes: the Islamic concept of the Qur'an, thematic and formal aspects of the Qur'an, modes of interpretation and principles of exegesis, and medieval and modern controversies regarding its history, formal structure, authorship, and authority. GER:3a (DR:7)
5 units, Spr (Dallal)

4 units, Spr (Jackson)

3 units, Win (Samoff)

51N. Stanford Introductory Seminar: Abraham Lincoln—Myth and Reality—Preference to freshmen. What we know about Lincoln from documentary sources is compared with his image in American memory and mythology. Students read/discuss Lincoln's speeches and letters, a standard biography, essays on controversial aspects of his career, a study of how Lincoln has been remembered, and a recent novel based on his life. How history is made and remade by historians, artists, and interest groups within American society. GER:3a (DR:7)
3 units, Spr (Fredrickson)

52N. Stanford Introductory Seminar: The Atomic Bomb in Policy and History—Preference to freshmen. Emphasis is on declassified files from WWII and later interpretations, addressing the questions: Why did the U.S. drop A-bombs on Japanese cities in August 1945? Were there viable alternatives, and, if so, why were they not pursued? What did the use of the A-bombs mean then, and later? How have postwar interpreters explained and justified, or criticized, the A-bombings, and why? Various approaches from history, international relations, American studies, political science, and ethics address the underlying conceptions, the roles of evidence, the logic and models of explanation, ethical values, and cultural/social influences in the continuing dialogue on the atomic bomb. GER:3b (DR:9)
4 units, Spr (Bernstein)

85Q. Stanford Introductory Seminar: Jews and Muslims—Preference to sophomores. The history of Jewish communities in the lands of Islam and their relations with the surrounding Muslim populations from the time of Muhammad to the 20th century. Topics: the place of Jews in Muslim societies, Jewish communal life, variation in the experience of
communities in different Muslim lands, the impact of the West in the
Modern period, the rise of nationalisms, and the end of Jewish life in
Muslim countries. GER:3b,4a (DR:9 or 2)
   5 units, Win (Rodrigue)

90Q. Stanford Introductory Seminar: Buddhist Political and Social
Theory—Preference to sophomores. Contemporary Buddhist political
theory and its historical and textual roots, emphasizing Tibetan, Thai, and
Sri Lankan Buddhism. Topics: society and polity in Buddhist thought,
Buddhist spiritual practice as social and political practice, sovereignty,
the individual and society, Buddhist economic theory and practice,
Buddhism and the state, Buddhist political and social theory in practice,
differences between Vajrayana (Tibetan) and Theravada (S. E. Asian)
Buddhist social theory. GER:3b,4a (DR:9 or 2)
   5 units, Spr (Mancall)

INTRODUCTORY LECTURES

For students with little or no previous experience in college-level
history, these courses survey a specific topic and introduce the methods
of the discipline. All are meant to serve as foundations for more advanced
course work within the department.

13. The Emergence of Modern Medicine—How did medicine emerge
as a distinctive body of knowledge and as a profession in the age of
Vesalius and Harvey? Why did physicians, rather than other medical practitioners, come to dominate medicine? The history of medicine from
approximately 1000 to 1700. Topics: the history of the body, the religious
and cultural significance of disease, development of hospitals, the rise of
public health system. Compares medical knowledge and institutions in
western Europe and Islam.
   5 units, Spr (Findlen)

(Enroll in Science, Technology, and Society 102.)
   3-5 units, Aut (Gorman)

24A,B. Ten Days that Shook the World—(Enroll in Introduction to the
Humanities 24A,B.)
   24A. 5 units, Win (Rodrique)
   24B. 5 units, Spr (Buc)

26A,B. Democratic Society in Europe and America: Origins, Crises,
Dilemmas—(Enroll in Introduction to the Humanities 26A,B.)
   26A. 5 units, Win (Kennedy, Lounge-Chappell)
   26B. 5 units, Spr (Kennedy, L. Roberts)

28. The Second World War—(Formerly 128.) The diplomatic, mili-
tary, and political history of the war in Europe and America. Themes: the
crisis in the international state system following WW I, the origins of
WW II, the nature of wartime leadership, the relationship between
strategy and politics, the mobilization of societies for war, the character
of combat, war and race, and the afterlife of the war in public and private
memory.
   5 units (Kennedy, Sheehan) not given 2000-01

33A. The Rise of Scientific Medicine—The intellectual, social, and
institutional dimensions of the rise of scientific medicine in the 19th and
20th centuries. How did medicine become “scientific”? What differenc-
es did science make to the practicing physician? Why did it displace other
approaches to medicine? Focus is on medicine in Europe and the U.S.,
1800 to the present. Topics: the development of experimental physiolo-
gy, bacteriology, pharmacology, biomedical technology, nuclear medi-
cine, biomedical imaging, computers in medicine, and prospects for
bedside gene therapies; the effects of scientific developments in biomed-
ical science and of technology on medical practice and therapy; the
professionalization of medicine in comparative European and American
contexts. GER:3b (DR:9)
   5 units (Lenoir) not given 2000-01

61. The Constitution and Race—The relation between the develop-
ment of American constitutionalism and the politics and jurisprudence of
slavery and race during the creation of the federal republic, the crisis of
Civil War and Reconstruction, and the civil rights revolution of the mid-
20th century. GER:4b (DR:3)
   5 units (Rakove) not given 2000-01

65. Introduction to Comparative Studies in Race and Ethnicity—
Introduction to how various disciplines approach the study of race and
ethnicity; identifying important topics and issues central to the study of
ethnic and race relations in the U.S. and elsewhere, and exposing students
to several History and other senior faculty affiliated with the Program in
Comparative Studies in Race and Ethnicity. Key faculty provide weekly
lectures augmented by discussion sections taught by CSRE Teaching
Fellows. GER:3b, 4b (DR:3 or 9)
   5 units, Spr (Camarillo)

75. The United States and East Asia—Introduction to the history of
political, social, military, and cultural interactions between the U.S. and
the societies of E. Asia (China, Japan, Korea, Vietnam, and the Philip-
pines) from the mid-19th century to the present. Major wars and diplo-
matic events, mutual perceptions, reciprocal consequences, and long-
term trends generated by these events and the circumstances that brought
them about. Structured as an American narrative with full voice to E.
Asian perspectives. GER:3b (DR:9)
   5 units, Win (Chang, Duus)

80. Culture, Politics, and Society in Latin America—Introduction to
the political and social history of Latin America. Emphasis is on the
interaction between institutional change, social structure, and political
movements, emphasizing the environment and cultural values. GER:3b,4a
(DR:2 or 9)
   5 units, Win (Wirth)

87. Empires and Cultures in the Modern World—The formation of
modern European empires and their expansion into Asia, Africa, and the
Middle East. Topics: cultural encounters, military conquest, economic
integration, the new imperialism, colonialism, nationalism, the mutual
constitution of colonial power and forms of knowledge, and the culture
and politics of the post-colonial world. Readings: historical texts, films,
and novels. GER:4a (DR:2)
   5 units (Staff) not given 2000-01

88. Imagining Jewish Civilization—(Same as Religious Studies 29.)
Interdisciplinary introduction to the various forms of Jewish self-expres-
sion, literature, religion, and history from the Biblical period to the
present. Topics: power and powerlessness, conflicting notions of the
divine, evil, beauty, community, gender, and learning through the ages.
Guest lectures, films, reading of primary and secondary texts.
   5 units (Eisen, Zipperstein) not given 2000-01

92A. The Historical Roots of Modern East Asia—E. Asia (China,
Korea, and Japan) in the 17th through the early 19th centuries. During
this time, E. Asia comprised the most populous, urbanized, economically
advanced, and culturally sophisticated societies in the world. Emphasis
is on the complexity of “pre modern” E. Asia and understanding it on its
own terms. GER:3a,4a (DR:2 or 7)
   5 units, Aut (Kahn)

92B. East Asia in the Age of Imperialism—Recommended for students
planning to do additional work on the region. Interdisciplinary introduc-
tion to the political, social, cultural, and economic development of E.
Asia from 1840 to 1945. The various responses in China, Japan, and
Korea to Western penetration of the region. Asian perspectives. GER:3b
(DR:9)
   5 units (Duus) not given 2000-01
SOURCES AND METHODS SEMINARS

These are intended to introduce the undergraduate major or prospective major to the processes of historical investigation and interpretation by which archival material becomes narrative description and explanation, and by which interpretation itself becomes open to disagreement and revision. The object is to take the beginning student into the historian’s workshop and to provide first hand experience in interpreting documents, constructing a coherent story from them, interpreting their larger implications, and in discovering why it is possible to agree on the facts but to disagree on what they mean. These courses are numbered 1 through 99 followed by the letter ‘S.’

12S. Sources and Methods Seminar: Religion, Revolution, and Reaction in the German Reformation—In 1510, Germany and Switzerland were fundamentally unified in religion; by 1530, they were deeply, bitterly, and often violently divided in religion and politics. What factors contributed to this upheaval? How did people react to religious change, and what moved those who sought to create or suppress it? Did true Christianity mean the scriptural transformation of the individual, sociopolitical revolution, or fidelity to tradition? The period of the origins of modern Western Christian pluralism. Background readings plus primary sources in translation.
5 units (Gregory) not given 2000-01

13S. Sources and Methods Seminar: Religion, Revolution, and Reaction in the German Reformation—In 1510, Germany and Switzerland were fundamentally unified in religion; by 1530, they were deeply, bitterly, and often violently divided in religion and politics. What factors contributed to this upheaval? How did people react to religious change, and what moved those who sought to create or suppress it? Did true Christianity mean the scriptural transformation of the individual, sociopolitical revolution, or fidelity to tradition? The period of the origins of modern Western Christian pluralism. Background readings plus primary sources in translation.
5 units (Fei)

15S. Sources and Methods Seminar: The Medieval Church and Violence—The opposition to and sanctification of war and violence, including early Christian pacifism, the origins of the idea of crusade and of knighthood, and the fate of the Peace Movement of the 11th century. Using primary sources and secondary works, assesses ecclesiastical participation in military action and peace-making, and its causes and effects on the political and cultural order.
5 units (Buc) not given 2000-01

20S. Sources and Methods Seminar: The Art of Coexistence: Multinational Communities in East-Central Europe—Recent events in the Balkans have led us to view multi-national regions of East-Central Europe as disasters in the making. Though there is precedent for conflict in this region, there is also one for peaceful coexistence. The charms and challenges of life in multinational communities though autobiography, literature, private correspondence, and film.
5 units (Fei)

25S. Sources and Methods Seminar: Mapping Central Europe—Regional Identities in the 19th and 20th Centuries—Does Central Europe exist? The visions of Central Europe (Germany, the Czech lands, Austria, and Hungary) in the 19th and 20th centuries. The political and cultural movements which sought to define the borders and character of Central Europe from the revolutions of 1848 to the fall of the Berlin wall. The attempt to divide Europe into distinct nations and states, even as artists and politicians drew on shared traditions to do so. Political documents, visual art, music, memoirs, and film.
5 units (Murdoch) not given 2000-01

29S. Sources and Methods Seminar: Religion and Politics in American Culture—The contours of early American culture were fundamentally shaped by the dynamic forces of religion and politics. From the Mayflower Compact to the rhetoric of the Civil War, God and government have had an intimate relationship in the American mind. How did this relationship change over time? What impact did it have on American institutions, practices, and attitudes? Sources range from witchcraft trials to Uncle Tom’s Cabin.
5 units, Win (Holland)

31S. Sources and Methods Seminar: The France of Louis XIV—Primary sources (in English translation) are used to address: how great a king was Louis XIV, the chances of escaping starvation, how people “made it” during the Old Regime, Fouquet’s guilt or innocence, what mattered at the court, why peasants rebelled, how people lived their religion, what regulated population size.
5 units (Lougee Chappell) not given 2000-01

32S. Sources and Methods Seminar: The Psychology of Warfare—“Just War” in the Middle Ages—What were the Crusades and how did they occur? How could churchmen foster notions of pacifism while facilitating violence and sanctifying war? Is “holy war” a contradiction? The origins of the crusades and the mentality of religious warfare are understood through an assessment of textual sources (personal letters, canon law, art, and architecture).
5 units, Win (Nava-Vaughn)

5 units, Win (L. Roberts)

43S. Sources and Methods Seminar: Colonial Encounters—Life in African Cities—How does an examination of city life in colonial Africa shed light on processes and struggles for historical and social change? African societies, from the early 20th century through independence, experienced social and economic transformations through the growth in space and population of urban spaces. In cities, African communities interacted with and contested against colonial states for control of political, economic, and social activities. Africans seized moments of fluidity in urban spaces to create new forms of social interaction and identity. The focus is on archival documents, films, and novels by African and European inhabitants of colonial cities in E., W., and Southern Africa.
5 units, Spr (Jean-Baptiste)

48S. Sources and Methods Seminar: First Americans—Indian Identities in the American West (1865-Present)—Native American citizenship has been continually invented and reshaped by Native Americans and EuroAmericans, particularly in the 19th century. How was assimilation embraced or resisted? How did the reservation system and the Indian Citizenship Act of 1924 affect Native Americans’ perceptions of themselves as Americans? How Indian identities, race, and gender roles changed over time, using school records, autobiographies, and newspaper accounts.
5 units, Spr (Warren)

50S. Sources and Methods Seminar: Race and Popular Culture (in Black and White)—The evolution of the racial categories of black and white in popular culture, focusing on the emergence of cultural forms, genres, and movements after Reconstruction through WW II (e.g., dialect fiction, musical theater, early film, Harlem Renaissance). Connected to the development of these new forms is the refashioning and rearticulation of American ideas of white and black. GER:4b (DR:3)
5 units (M. Thompson) not given 2000-01

51S. Sources and Methods Seminar: The Politics of Self-Definition—Ethnic Nationalism in the Civil Rights Era—How was Chicanismo related to Black Power in the late 1960s? The phenomenon of radical ethnic politics through a comparative look at position papers,
speeches, letters, publications, poetry, and theater. How were political postures related to cultural postures? How were the boundaries of exclusion and inclusion determined? How were history, heritage, and legacy used in the rhetoric of these groups? How do these groups help us understand the U.S. in this period?

5 units, Spr (Chavez)

52S. Sources and Methods Seminar: Place and Identity in 19th-Century California—During the 19th century, California changed from a sparsely populated Spanish colonial outpost to a booming American state, bringing manifold peoples together and permanently altering the physical landscape. How have the people who have inhabited California made sense of the natural world and themselves? Contemporary sources are used to discover the shifting interplay between place and identity among the diverse peoples and landscapes of 19th-century California.

5 units, Win (St. John)

53S. Paris, Capital of the 19th Century—The philosopher, historian, and cultural critic Walter Benjamin described Paris as the "capital of the 19th century." The history of Parisian culture and the methods of the cultural historian are examined by following Benjamin on his perambulations through the city. Themes: urbanism, consumerism, working-class militancy, and radicalism in philosophy and the arts.

5 units, Spr (Kafka)

56S. Sources and Methods Seminar: Advertising and Consumer Culture in the United States—The history of modern materialism through the study of advertising. Theoretical and critical perspectives on consumption and recent historical interpretations of advertising and consumer culture in the U.S., focusing on the problems of using advertisements as sources for historical analysis.

5 units (Corn) not given 2000-01

60S. Sources and Methods Seminar: France in the Enlightenment—The social and cultural landscape of the French Enlightenment. How was "enlightenment" produced, packaged, and marketed in the 18th century? Do books cause revolutions? Emphasis is on the process of secularization, the rise of public opinion, and the emergence of critical conscience. These themes and related issues are investigated through primary sources in philosophy, autobiography, periodicals, forbidden works of literature, music, political caricature, etc.

5 units, Aut (Coleman)

62S. Sources and Methods Seminar: Unimagined Futures—The Environmental History of the Suburban West—The West has long been the nation's most urbanized region. After WW II, old and new Westerners poured into suburban centers from Anchorage to Tijuana, reshaping society and landscape. What made the suburban West distinctive? How do historians relate social change to changes in the land? The primary historical record, emphasizing Stanford collections.

5 units, Aut (Booker)

96S. Sources and Methods Seminar: Searching for Self—Biographies and Autobiographies in China—Texts from the 1st to 20th centuries. The various articulations of self-conception and self-expression in social, political, and religious contexts. Emphasis is on questions of the role of family and gender. GER:3a,4a (DR:2 or 7)

5 units (Neskar) not given 2000-01

UNDERGRADUATE LECTURES

100 through 199 are lecture courses.

GENERAL

102A. The International System—The history and analysis of world politics and international relations from the dominance of empires and nation-states at the turn of the century until the present. The influence of communism, fascism, and anti-imperialism on the system, and the emergence of "society" as a factor in international relations. Questions of sovereignty vs. the "new world order." GER:3b (DR:9)

5 units, Win (Naimark, Simons)

CLASSICS

102. Roman History I: The Republic—(Enroll in Classics 102.)

4-5 units, Win (Treggiari)

103. Roman History II: The Empire—(Enroll in Classics 103.)

4-5 units, Spr (Treggiari)

105. History and Culture of Egypt—(Enroll in Classics 105.)

4-5 units, Spr (Manning)

EASTERN EUROPE AND RUSSIA

119. Aristocracies and Absolutism: Early Modern Eastern Europe, 1400-1800—The societies and culture of E. Europe (Belorussia, Bohemia, Hungary, Poland, Ukraine) in the late medieval and early modern periods. The conflict of aristocratic parliamentary governments with absolutist states (Austria, Hungary, Prussia, Russia). E. Europe's development is contrasted to the Russian historical experience. GER:3b (DR:9)

5 units, Aut (Kollmann)

120A. Early Modern Russia, 1400-1762—Chronicles in the context of international trade and geopolitics. The expansion of Russia from its 14th-century origins to its achievement of a multiethnic empire stretching from Poland to Siberia, the Far East, and the Black Sea by the 18th century. Governance and society in conditions of autocracy: institutions of rule, social hierarchy, interethic relations in empire, tension between the center and periphery, serfdom and agrarian economy, social values and gender roles, popular religiosity, Russian Orthodoxy as institution and as arbiter of high culture, 18th-century immersion in European culture and attendant social tensions. Interdisciplinary: guest lectures on art and literature. Era of rapid change and social mobilization (Ivan IV, Peter I, Catherine II) are placed in the long-term context.

5 units (Kollmann) not given 2000-01

120B. Imperial Russia, 1762-1917—State, society, empire, and the international relations of Imperial Russia (18th-19th centuries to 1917) Alternate years with 120D. GER:3a (DR:7)

5 units (Emmons) not given 2000-01

120C. 20th-Century Russian and Soviet History—Survey and analysis of Russia in the 20th century, focusing on Soviet policy from its revolutionary advent in 1917 to its dramatic collapse in 1991. GER:3a (DR:7)

5 units, Aut (Weiner)

120D. Russian Intellectual and Cultural History to 1917—Companion to 120B. The development of Russian intellectual and cultural life under the impact of Western influences, from the reign of Peter the Great to the end of the Empire. Focus is on primary texts and cultural products. Recommended: 120B. GER:3a (DR:7)

5 units, Win (Emmons)

121. Russian Jewish History, 1772-1917—The social, economic, cultural, and political trends in Russian Jewish life from the Polish partitions until the 1917 Revolution: popular and elite cultures, changing family and social patterns, government attitudes toward Jews, perceptions of Jews in Russian culture, Jewish political cultures, and political radicalism. Emphasis is on regional differences and their impact on the character of Jewish life in the areas of Belorussia, Lithuania, Ukraine, etc.

5 units (Zipperstein) not given 2000-01

125. 20th-Century Eastern Europe—Major historical trends in 20th-century E. European history. Empires and national movements. The creation of independent Eastern Europe after WW I; social movements and the emergence of dictatorships and fascism in the inter-war period.
WW II, Stalinism, and destalinization in contemporary E. Europe.
   5 units, Spr (Jolluck)

MEDIEVAL AND EARLY MODERN EUROPE

100A. Europe from Late Antiquity to 1500—Themes of group identity, power, and religion, surveying the transformations of European society and power-structures from Augustus to Machiavelli. How did groups fashion and refashion themselves through contact with other groups, the pressures of politics, and the utilization of sacred norms? How did religions influence societies and how were religions transformed by societies? GER:3a (DR:7)
   5 units, Aut (Buc)

100B. Machiavellian Moments: Europe’s History, 1492-1793—Survey of the intellectual and social currents from the voyages of Columbus to the French Revolution.
   5 units (Lowee Chappell) not given 2000-01

100C. Introduction to Modern Europe—European history since the French Revolution has been a persistent attempt to come to terms with the promise and perils of the great revolutions of the 18th century. Readings: von Gentz, Adams, Marx, Fanon, Freud, de Beauvoir.
   5 units (Sheehan) not given 2000-01

105A. Introduction to Medieval Culture—(Same as English 165A, Medieval Studies 165.) Introduction to the development of medieval culture through religious, philosophical, literary, artistic, social, and political sources, with emphasis on the interrelationships among them. GER:3a,4c (DR:7f or 8f)
   5 units, Win (Brown, Miller)

110. Storming Heaven: Christianity in Conflict in Early Modern Europe—What happens when a culture holds that right religion is absolutely necessary for salvation, yet disagrees about its content? A multi-perspectival view of divergent Christian traditions from the early 16th to the mid-17th centuries, with parallels to religious “hot spots” in our own world. Topics: the character of the late medieval Church, humanism and Catholic reform, Luther and the early evangelical movement, the rise and spread of Anabaptism, Calvin and the exportation of Calvinism, the Council of Trent and Counter-Reformation, the Wars of Religion in France and the Netherlands, and the process of confession-alization. GER:3a (DR:8)
   5 units, Win (Gregory)

MODERN EUROPE

130. From Enlightenment to Revolution: France in the 17th and 18th Centuries
   5 units (Baker) not given 2000-01

130B. France from 1750 to the Present—France has long been viewed as the epitome of civilized values and cultural distinction; but it has also been associated with chronic political instability, violent revolution, and anarchistic political rebellion. The diverse and contradictory features of one of world’s great powers, starting in the 18th century where France produced Voltaire, Rousseau, and the Enlightenment, and Robespierre, and to the present. Use of literature, art, and film.
   5 units (M. L. Roberts) not given 2000-01

134. European Economic History—(Enroll in Economics 115.)
   5 units, Aut (Greif)

136A. European Thought and Culture in the 19th Century—Major European thinkers and intellectual movements from the Enlightenment to Modernism. Readings: Matthew Arnold, Jane Austen, Karl Marx, John Stuart Mill, Friedrich Nietzsche, Emile Zola, etc.
   5 units (Robinson) not given 2000-01

136B. European Thought and Culture in the 20th Century—Important European thinkers and intellectual movements of the 20th century, from Freud to Foucault.
   5 units (Robinson) not given 2000-01

137. The Holocaust—The emergence of modern racism and radical antisemitism. The Nazi rise to power and the Jews. Anti-semitic legislation in the 1930s. WW II and the beginning of mass killings in the East. Deportations and ghettos. The mass extermination of European Jewry.
   5 units (Rodrique) not given 2000-01

HISTORY OF SCIENCE AND TECHNOLOGY

106. The Prehistory of the Computer—(Enroll in Science, Technology, and Society 126.)
   3-5 units, Spr (Gorman)

133A. The Darwinian Revolution—(Same as 333.) The conceptual developments leading to establishment of the major unifying paradigm of biological science, the theory of evolution by natural selection. Biological thought before Darwin (1800 to 1836). The voyage of the Beagle and the formation of Darwin’s thought in terms of its broader intellectual and social context. The Origin of Species. Descent of Man. The difficulties the theory had to overcome and their resolution in the union of evolutionary biology and population genetics in the 1930s and ‘40s.
   4 units (Lenoir) not given 2000-01

133B. The Sociology of Scientific Knowledge—Classical problems in the sociology of knowledge in the writings of Marx, Durkheim, and Mannheim. Recent works in the social construction of scientific knowledge, emphasizing the historical sociology of experimental science and lab practice. Case studies and the anthropological approaches in the works of Mary Douglas, Pierre Bourdieu, and others are used to explore a theory of practice and a critique of historically situated practical reason as the foundation of the sociology of scientific knowledge.
   4 units (Lenoir) not given 2000-01

139. The Scientific Revolution—Recent studies and related primary materials (in translation) reassess the claims made for the “scientific revolution.” Studies of early modern science have broadened our understanding of the period, from work on museums and gentlemanly trust to the sciences of non-European cultures.
   5 units (Staff) not given 2000-01

BRITAIN

141. Yorkist and Tudor England—The Making of a Modern State—The transition from the late medieval realm to the Renaissance monarch, Henry VIII, the English Reformation, and the new conservatism of the Elizabethan regime.
   5 units (Seaver) not given 2000-01

142. Revolutionary England, 1603-1689—Analysis of the conditions that led to the first of the modern revolutions, the collapse of the Stuart monarchy, the beheading of the king, the first and only English experiment with a republic, the attempt of the Restoration to recreate a stable royal absolutism, and its final defeat in the “Glorious Revolution” of 1688-89. Radical ideas emerging in the heat of revolution.
   5 units (Seaver) not given 2000-01

143. Shakespeare’s England, 1558-1640—Introduction to a period of early modern English history when England was still a minor power and when Elizabeth Tudor and then her Stuart cousins tried to exploit the new powers acquired by the monarchy under Henry VIII, before the society was torn apart by civil war. This society produced three of its greatest dramatists, perhaps its greatest philosopher of science, and an unrivaled outpouring of poetry. It would be reductio to argue that social, political, and economic developments "explain" this period of literary
production, but the social, political, and religious world in which it took place is sketched. GER:3a (DR:7)
5 units, Aut (Seaver)

144. Britain, 1688-1832—(Same as 244.) Survey/colloquium. Alternate meetings provide a broad knowledge of British society in its political, social, intellectual, and cultural aspects, and considers one text in depth (a historical study, novel, etc.) for what it may say about Britain from the Glorious Revolution of 1688 to the Great Reform Act of 1832. 5 units (Stansky) not given 2000-01

145C. Modern Britain—(Same as 245C.) Survey/colloquium. Alternate meetings provide a sense of British history in the 19th and 20th centuries in its political, social, intellectual, and cultural aspects and considers one text in depth (a historical study, novel, etc.) for what it may tell us, in the broadest and most particular senses, about the recent history of Britain. 5 units (Stansky) not given 2000-01

AFRICA

147A. African History in Novels and Film—The principal episodes in African history have been captured in novels and, to a lesser extent, in film. What happens to history and historical understanding as they undergo transformation in imaginative literature and film. Does the African novel fairly represent history? Is film only an imperfect vision of African past events? GER:4a (DR:2)
5 units (Jackson) not given 2000-01

147B. The Idea of Africa among African Americans—No group within the Black diaspora has developed more notions, sometimes competing, of Africa than African Americans since the late 18th century. The crucial moments in that envisioning of Africa, from the free Black identifications of the 1770s-1840s to Marcus Garvey’s 1920s homeland ideologies and the 1990s Mandela fever. GER:4b (DR:3)
5 units (Jackson) not given 2000-01

148. Introduction to African History—African history from the discovery of early humans in E. Africa to the 1990s. Geared to students who want to master the basics of Africa’s past while engaging more advanced analysis. Films, novels, autobiographies, slides, readings. GER:3a,4a (DR:2 or 7)
5 units, Aut (Jackson)

148B. Northeast Africa and the Red Sea: Imperialism, Regional Identities, Postcolonial Conflicts—The ancient historical linkages between the Nile Valley, Red Sea, and Abyssinian highlands. The effect of successive imperialist projects (Ottoman, Egyptian, British, Italian, Ethiopian) on the formation of new political identities and economic relationships in what are today the countries of Sudan, Ethiopia, and Eritrea. Emphasis is on the roots of the Eritrean/Ethiopian conflict and the north/south conflict in Sudan. Analysis of key post-colonial issues, including the linkage between nationalist wars and regional famines; the politics of refugee resettlement; the rise of politicized Islam; the failure of women’s emancipation projects; and the environmental and social impact of agricultural modernization schemes. 5 units, Win (Killion)

148C. Africa in the 20th Century—The challenges facing Africans from when the continent fell under colonial rule until independence. Lectures are organized around case studies of colonialization and its impact on African men and women drawn from West, Central, and Southern Africa. Discussions on novels, plays, polemics, and autobiographies written by Africans. GER:3a,4a (DR:2 or 7)
5 units, Spr (R. Roberts)

THE UNITED STATES

115. Technology and Culture in 19th-Century America—The social and cultural aspects of technological change from the American Revo-

407
JEWISH HISTORY

Topics: theories of inequality; history of feminism; international and multi-cultural perspectives on feminism; women’s work, health, and sexuality; creativity, spirituality, and movements for social change.

GER:3b,4c (DR:9f)

5 units, Spr (Kennedy)

166. American Economic History—(Enroll in Economics 116.)

5 units, Win (Wright)

172A. The United States since 1945—Analyzes foreign policy and politics, dealing with social themes and intellectual history. GER:3b (DR:9)

4-5 units, Win (Bernstein)

173B. U.S. Women’s History, 1820-1980—The transformation of Victorian womanhood in the late 19th century, including the workforce participation of immigrant and black women and the educational and professional opportunities for middle-class white women, the impact of wars and depression on 20th-century women’s lives, and the rebirth of feminism.

5 units, Spr (Horn)

173C. Introduction to Feminist Studies—(Same as Feminist Studies 101.) How gender inequality is created and perpetuated, and when feminist theory and movements emerge to respond to gender inequality. Topics: theories of inequality; history of feminism; international and multi-cultural perspectives on feminism; women’s work, health, and sexuality; creativity, spirituality, and movements for social change.

GER:3b,4c (DR:9f)

5-6 units, Win (Freedman)

LATIN AMERICA

177. Modern Latin America—Latin America since the early 19th century, concentrating primarily on Mexico, Brazil, Argentina, and Cuba. Emphasis is on Latin America’s role in the world economy and the effect that this has had on economic growth, social structure, and politics.

GER:4a (DR:2)

5 units, Aut (Haber) not given 2000-01

178. Colonial Latin America—The Iberian and indigenous roots of Latin American culture and society. The colonial era: the encounter and conquest through the eyes of the victors and the vanquished; strategies of domination and resistance for Central Mexico, the Andes, and Brazil. The mature structures of colonial life, socioeconomic and cultural; sources of tension and change within colonial Latin America during the 18th century. Interpretations of the breakdown of colonial authority and the rise of independence movements.

5 units, Aut (Frank)

180. 20th-Century Brazil—Brazil, a continent-sized nation and multi-ethnic society, is at a crossroad: how to achieve economic growth with social and regional equity in an era of trading blocs. Brazilian efforts to come to terms with its long colonial history based on export agriculture, slavery, and extractive industries, while developing an urban-based, industrial society. Brazil’s rise as a middle range economic power and the development of a dynamic national culture.

GER:3b,4a (DR:2 or 9)

5 units, Spr (Wirth)

JEWISH HISTORY

184. Jews in the 20th-Century United States

5 units (Zipperstein) not given 2000-01

188B, C. Jewish History from the Medieval Period to the Present—Designed as a sequence, but may be taken independently. (188B is in department fields III and IV; 188C is in III.)

188B. Jews in the Medieval World—The legal status, economic activities, communal organization, religious, intellectual, and social life of Jews in medieval societies from the beginnings of the Jewish settlement into the 16th century, in Christendom and under Islam. Rabbinic culture and medieval Jewish philosophy, Jewish self-perceptions and attitudes to non-Jews, Jewish-Christian polemics, Church attitudes and policies to the Jews, anti-semitism, expulsion and anti-Jewish violence.

5 units (Rodrigue) not given 2000-01

188C. Jews in the Modern World—Jewish history in the modern period. Possible themes: the fundamental restructuring of all aspects of Jewish existence under the impact of the Enlightenment and legal emancipation at the end of the 18th century in Western Europe, the transformation of Jewish life in Eastern Europe under the authoritarian Russian regime, the experience of colonialism in the Sephardi world, and the range of new ideologies (Reform Judaism and various Jewish nationalisms), the persistence and renewal of anti-semitism, the destruction of European Jewry under the Nazis, the rise of new Jewish centers in the U.S., and the emergence of the State of Israel.

GER:3a (DR:2 or 7)

5 units, Aut (Davis)

MIDDLE EAST

185. Introduction to Islamic Civilization—Introduction to the societies and cultures in which Islam has been the dominant religious tradition, focusing on the Middle East. Topics: the faith of Islam; the career of the prophet Muhammad; Islamic political theory; Islamic law, philosophy, and science; relations among Islam, Christianity, and Judaism; modern currents in Islam. GER:3a,4a (DR:2 or 7)

5 units, Aut (Dallal)

187A. The Middle East in the 20th Century—The history of the Middle East since WWI, focusing on the eastern Arab world, Egypt, the Fertile Crescent, and the Arabian Peninsula (The Mashrig), with some attention to Turkey, Iran, and Israel. GER:3b,4a (DR:2 or 9)

5 units, Win (Beinin)

187C. Women in the Modern Middle East—Women’s role in the modern Middle East. Topics: work, religious expression, politics, and family life. Format: one film showing per week with associated lecture and discussion.

GER:4c (DR:1)

5 units (Beinin) not given 2000-01

189A. Israel: 1880 to the Present—The beginnings of the Zionist Movement, the establishment of the State of Israel, and the development of Israeli society, culture, and politics. Analysis of the ideologies and institutionalization of the Zionist movement and Jewish nationalism in its various forms; Ottoman and Mandate Palestine and the growth of the Zionist movement and Jewish nationalism in its various forms; Ottoman and Mandate Palestine and the growth of the Jewish settlement there, including social experimentation, relationships with the Palestinians and their responses to Zionism; the revolt against the British. Israel since independence: its institutions, international relations, and relations with Jewish communities outside of Israel.

GER:4a (DR:2)

5 units (Mancall) not given 2000-01
in the 17th century; European imperialism in the Middle East; westernizing reforms in the 19th century; the Balkan Wars, WW I, and the collapse of the Ottoman Empire. GER:4a (DR:2)
5 units (Rodrique) not given 2000-01

SOUTH ASIA

5 units, Win (Mancall, Pandya)

190A. Introduction to the History of Buddhism—Survey of the history of Buddhism, focusing primarily on Central, South, and S. E. Asia. The historical Buddha. The development, evolution and spread of Buddhist institutions and Buddhist practices. Political, social, and economic aspects. Buddhism and the state. Buddhist law and social thought. Modern and contemporary Buddhist social movements. The spread of Buddhism in the West.
5 units (Mancall) not given 2000-01

EAST ASIA

192A. Chinese History to the 13th Century—From Peking Man to Kubilai Khan. Emphasis is on social, religious, and intellectual developments from the Earliest Times through the Mongol dynasty. GER:3a,4a (DR:2 or 7)
5 units, Aut (Neskar)

192B. Chinese History from the Mongols to Early Modern Times—From the late Yuan to the Taiping Rebellion. Emphasis is on socio-economic rather than the political history to expose students to a sophisticated society very different than their own. Recommended: 192A. GER:4a (DR:2)
5 units (Kahn) not given 2000-01

192C. Modern China—China's development from the relative peace and prosperity of the late 18th century through the wars and imperialist incursions of the 19th century, and the struggle in the 20th century to create a modern nation-state and regain a position of wealth and power in an often-hostile world. The crushing of the pro-democracy movement at Tiananmen in 1989 and its consequences. Chinese materials in translation (novels, autobiographies, newspaper accounts, reports, and films) explore how individuals experienced the major political, cultural, social, and economic transformations of the past two centuries. Recommended: 192A,B, 192A,B, or Political Science 115. GER:3b,4a (DR:2 or 9)
5 units, Sp (R. Thompson)

194A. Japan from Earliest Times to 1560—The prehistoric origins of the people and culture, and emergence of the first polity, Chinese influences, the flowering of the native culture, samurai and feudal government. GER:3b (DR:9)
5 units, Aut (Mazz)

194B. Late Medieval and Early Modern Japan—From the Warring States Period to the establishment and rise of the last Shogunal house, the Tokugawa. The social, religious, and political contours of the age.
5 units (Styles) not given 2000-01

194C. 19th-Century Japan
5 units (Styles) not given 2000-01

194D. The Rise of Modern Japan—Japanese history from 1840 to the present. Topics: the Meiji Restoration and its background, building a modern state, industrialization of the economy, the emergence of an imperialist power, the reorientation of postwar Japan, and the "economic miracle." Socio-economic change and political developments. GER:3b,4a (DR:2 or 9)
5 units, Spr (Duus)

UNDERGRADUATE COLLOQUIA AND RESEARCH SEMINARS

Colloquia consist of reading and discussion on specific historical themes. Short papers, reports, historiographical essays, and a final exam may be required. In all cases, colloquia are designed to examine issues of historical interpretation. Oral presentations are encouraged.

Undergraduate research seminars provide students with opportunities to conduct research using primary documents, engage in historiographical debate, or to interpret major historical events. Seminars may be offered for one or two quarters and they may be combined with a colloquium. In all cases, students write preliminary drafts of their research findings, present oral reports, and revise their papers.

Courses 200 through 299 are primarily for juniors and seniors majoring in history. Admission is by consent of the instructor.

200A,B,C. Senior Research I, II, and III—(WIM)
1-5 units (Staff)

200H. Junior Honors Colloquium
3 units, Spr (Gregory)

200M. Undergraduate Directed Research: Martin Luther King, Jr. Papers Project
units by arrangement (Carson)

200W. Undergraduate Directed Reading
units by arrangement (Staff)

200X. Undergraduate Directed Research and Writing—(WIM)
units by arrangement (Staff)

GENERAL

201. Undergraduate Colloquium: Varieties of Islamic Revival since 1870—Revivalist and modernist thought and movements in the Islamic world in their evolving sociopolitical contexts (imperialism at its height and in decline; independence in Cold War conditions; globalization). Variants from across the Islamic world, Arab and non-Arab, and impulses from within Islamic traditions and outside pressures. The conceptual focus is on Islam and the state.
5 units, Spr (Simons)

201B. Undergraduate Colloquium: Great Ideological Movements of the 20th Century—Socialism and the Islamic Revival—(Same as 301B.) Surveys and compares two ideological responses to the challenges of modernization and globalization in traditional societies and polities. For socialism, the focus is on the European East and the first half of the 20th century; for the Islamic revival, the Arab world and S. Asia in the last 50 years. Readings and analysis of key thinkers in their sociopolitical contexts, drawing on the professor’s quarter-century of diplomatic and personal experience in the U.S.S.R., Eastern Europe, and S. Asia.
5 units (Simons) not given 2000-01

201F. Undergraduate Colloquium: 20th-Century Turkey, Iran, and Pakistan—(Same as 301F.) The histories of three non-Arab Muslim countries as they stayed independent and struggled with their Islamic identities in the shadow of their great northern neighbor. The hypothesis is that their success or failure in adapting to today's challenges will decide whether the nations between Morocco and the Philippines play the same world role in the 21st Century that the European East has played
in ours. Professor draws on his half-century of personal and diplomatic experience in Pakistan and with communism.

5 units (Simons) not given 2000-01

202. Undergraduate Colloquium: Introduction to Problems of Historical Interpretation and Explanation—(Same as 302A.) Focus is on problems of historical narrativity: the relationship between the past and stories about the past, history and the novel; other epistemological issues.

5 units, Spr (Emmons)

202D. Undergraduate Colloquium: Biological Approaches to History—History can be understood by studying changes in the biological features of human kind through the systematic analysis of information on health, nutrition, demographic behavior, and living standards of different societies over time. Emphasis is on the impact of historical events (revolutions or wars) on the material quality of life.

5 units, Win (López-Alonso)

203. Undergraduate Colloquium: India, Pakistan, and U.S. Policy since the Cold War—Case study of issue and policy formation in a major world region in post-Cold War circumstances. The interplay of internal and external pressures: economic crisis and liberalization as key foreign partners fade at Cold War's end; democratic experiment in Pakistan, Congress decay and the rise of the BJP in India; arms control progress and the 1998 nuclear explosions; shifting configurations (involving the U.S.) since then. Instructor draws on his experience as U.S. ambassador to Pakistan 1996-1998.

5 units, Spr (Simons)

205A. Undergraduate Colloquium: Private Lives, Public Stories—Autobiography in Women's History—Autobiographies and other sources. The changing contexts of women's lives and the way women's actions have shaped and responded to those contexts. GER:4c (DR:f)

5 units, Spr (Loungee Chappell)

INTERDISCIPLINARY GATEWAY COLLOQUIA

204. Undergraduate Colloquium: History and the Arts—Britain in the 20th Century—Using British examples, the historical significance of novels, poetry, art, film, music, etc. (WIM)

5 units, Aut (Stanley)

206. Undergraduate Colloquium: The Logic of History—(Same as 306.) Introduction to the literature for students in history and the social sciences. How do historians advance and sustain arguments? What is evidence and how is it treated? What are the rules of argumentation that underlie different types of history, and how do these differ from those found in the social sciences? In the writing of history, what constitutes a truth claim? Readings/discussion of the literatures on case study methods, the philosophy of history and social science, and actual historical case studies.

5 units (Haber) not given 2000-01

206B. Design and Methodology for International Field Research—(Same as 306B.)

1 unit, Win (Kollmann, R. Roberts)

206P. Undergraduate Colloquium: The Scientific Revolution—(Same as 306P, History and Philosophy of Science 206P.) What sort of tools do historians use to understand and interpret science? How did science emerge as a distinctive kind of knowledge? Introduces the history of science as a field of study, using the Scientific Revolution of the 16th and 17th centuries, the age of Copernicus, Galileo, Kepler, and Newton, as a case study in the historical interpretation of science. The intellectual, cultural and institutional context in which western science emerged. How historians have explained and debated the birth pangs of modern science.

5 units, Win (Gorman)

217. Undergraduate Colloquium: Men, Women, and Power in Early Modern Russia, 1500-1800—Social values, gender relations, and social change in an era of rapid change: challenges to established norms by new constructions of deviance (witchcraft, religious reform, and revolt) and by new standards of civility; encounters with non-Russians and the construction of national consciousness. Social values as political ethos: patrimonial autonomy and the reality of female rule in the late 17th and 18th century. (WIM)

5 units, Spr (Kollmann)

219S. Undergraduate Research Seminar: The Soviet Civilization—(Same as 419.) Socialist visions and practices of the organization of society and messianic politics; the Soviet understanding of mass violence, political and ethnic; and living space. Readings of secondary and primary sources and writing of a research paper or a historiographical essay.

5 units (Weiner) not given 2000-01

221C. Undergraduate Colloquium: Historiography of the Soviet Union—(Same as 321C.) Introduces the major schools of interpretation of the Soviet phenomenon through works representative of a specific school, in chronological order, from the first major interpretation of the Soviet polity by Trotsky to the current postmodernist theories.

5 units, Win (Weiner)

221S. Undergraduate Research Seminar: Wartime and Postwar Poland—The problems of German and Soviet occupation. Polish resistance during the war, dilemmas of Polish politics, the end of the war and beginning of peace. The relationship between social changes and political movements. The complex nationality issues involving Germans, Jews, Poles, Russians, and Ukrainians.

5 units (Naimark) not given 2000-01

222A. Undergraduate Colloquium: Myths and Identities in Modern Ukraine—(Same as 322A.) The evolution and interaction between various national identities of stateless Ukrainian populations throughout the century, until Ukrainian statehood in 1991. Focus is on the core of the Ukrainian population; the Soviet Union; and Ukrainian populations in Poland, Czechoslovakia, Romania, and Hungary. Ethnic, regional, and political visions of national identities, the emergence of mass political movements, the rise of radical ideologies and regimes, the experience of WW II and the unification of Ukrainian land and people, and the struggle for definitive national myths to the present.

5 units (Weiner) not given 2000-01

223. Undergraduate Colloquium: Honor, the Law, and Modernity in Early Modern Europe—(Same as 323.) How individuals constructed their sense of honor in Europe (including Russia) from medieval times to the 18th century, and how they defended honor through law and litigation, extra-legal sanctions (feuds, duels), and ritual (charivari). The rise of the duel as a turning point in Europe towards modern concepts of honor and civility, social hierarchy, and legal practice.

5 units (Kollmann) not given 2000-01

224. Undergraduate Colloquium: Stalinism in Eastern Europe—(Same as 324.) The origins and history of Stalinism in Eastern Europe. The ways E. European countries confronted the Stalinist past. Readings on historical and literary representations of Stalinist theory and practice.

5 units (Kollmann) not given 2000-01

225. Undergraduate Colloquium: The Russian Revolutionary Tradition—(Same as 325.) The history and myths behind the Russian Revolution.

5 units (Emmons) not given 2000-01

225D. Undergraduate Colloquium: East European Women and War in the 20th Century—Societies in Eastern Europe during war and
occupation, WW I to the crisis in Bosnia. Women’s experiences in war, including changes in their lives from war, how they interpret these changes, how women participate, and how they are used physically and metaphorically by belligerents and compatriots. The interplay of gender nationality in the construction and manipulation of identities. Emphasis is on sources, historiography, theoretical approaches, and comparisons with Western Europe and the former Soviet Union.

5 units, Win (Jolluck)

226. Undergraduate Colloquium: Modernity, Revolution, and Totalitarianism—(Same as 326.) Analysis of modern revolutionary and totalitarian politics based on readings of monographs on the medieval, Reformation, French Revolutionary, and the Great War eras which deal with relevant themes. Topics: the essence of modern ideology, the concept of the body national, state terror, charismatic leadership, gender assignments, private and public spheres, and identities.

5 units, Win (Weiner)

MEDIEVAL AND EARLY MODERN EUROPE

207. Undergraduate Colloquium: Jews, Christians, and Muslims—Medieval Spain—(Same as 307.) From the Islamic conquest of 711 A.D. to the Christian expulsion of the Jews in 1492. Forms of confrontation (theological debate to systematic violence) and forms of confluence (conversion to cultural overlap), and hostile indifference between Jews, Christians, and Muslims. What were the undercurrents of aggression that gave rise to persecution of the “other” in medieval Spain? What were the elements of commonality between groups that gave rise to great intellectual advancements? The dynamics of the three religions elsewhere in the medieval Mediterranean.

5 units, Spr (Miller)

208. Undergraduate Colloquium: The Conversion of Europe—The formation of Christian Europe is examined through the conversion experiences (actual and remembered) of historical figures and communities. The riddle of the first Christian emperor, Constantine; the Christianization of Germanic society, Scandinavia; and the issue of conversions to more spiritual ways of life within the Christian faith.

5 units (Buc) not given 2000-01

209A. Undergraduate Colloquium: Law, Society, and Identity in Christianity and Islam, 500-1500—(Same as 309A.) Introduction to Mediterranean society and the interplay of law, morality, and social customs in the Middle Ages. Sources of law, forms of legal reasoning and procedure (courts to informal dispute settlements), coercive mechanisms for enforcing rules, and religious obligations in Christian and Islamic communities. Spain and Egypt as case studies. How do groups use law to build communities? When does law create order and when does it reproduce exploitative relations? What is the relation between law and gender?

5 units (Miller) not given 2000-01

209B. Undergraduate Colloquium: Crusades, Pilgrimages, and Voyages of Discovery—The Expansion of Medieval Europe—(Same as 309B.) Medieval Mediterranean travelers, their motivations (religious, military, economic, scholarly) and how they perceived the cultures they encountered. Readings: a Muslim scholar’s travels, letters of Jewish merchants to their families, the report of a 10th-century Christian ambassador to Constantinople, and a 20th-century novel that reconstructs the peregrinations of a 12th-century Indian slave based on medieval Jewish sources from Egypt.

5 units, Win (Miller)

210A. Undergraduate Colloquium: The Language of Politics in the Middle Ages—(Same as 310A.) The different methods through which political theory was articulated and communicated and a culture of politics created: language proper and its grammar (as in biblical exegesis and other mediums), gestures (and the theory of gestuality), royal proclamations, rituals (peace-making and conflict-resolution, royal funerals, advents, and coronations), and iconography.

5 units (Buc) not given 2000-01

211. Undergraduate Colloquium: Body, Gender, and Society in Medieval Europe—(Same as 311.) Secondary sources (historical, literary, theological, and anthropological studies). Issues: transformations in representations of the body, gender, sexual ity, and in women’s place in society (or social representation) in Western Europe between the 3rd and 14th century. Were these processes related with one another and with social changes? Analytically straddles the realm between bodification of spiritual powers and control (or manipulation) of the body in society, from the cult of relics to asceticism. GER:4c (DR:↑)

5 units, Spr (Buc)

213A. Undergraduate Colloquium: New Worlds, Imaginary Worlds—(Same as 313A.) Why does the idea of ‘utopia’ first emerge in the Renaissance and Reformation? What does it mean to imagine a society? During the 16th and 17th centuries, Europeans developed greater knowledge of other parts of the globe (the Americas, Asia) and began to explore questions of nature and society in new ways, looking more critically at their own society and others. Topics: travel, knowledge, and experience: changing definitions of humanity; reason and imagination; order and deviance in the age of Columbus, More, Galileo, and Kepler.

5 units (Findlen) not given 2000-01

213B. Undergraduate Colloquium: Heretics, Prostitutes, and Merchants—Venice and its Empire—(Same as 313B.) Why was the myth of Venice so powerful? Between the 13th and 17th centuries the Republic of Venice created a powerful empire that controlled much of the Mediterranean. Situated at the boundary between East and West, Venice established a thriving merchant society that allowed many social groups, religions and ethnicities to coexist within its borders. The essential features of Venetian society, as a microcosm of late medieval and early modern Europe. The relationship between center and periphery, order and disorder, orthodoxy and heresy, and the role of politics, art, and culture in the Venice Renaissance. The decline of Venice as a political power and its reinvention as a tourist site, living museum, and subject for literature and film. (WIM)

5 units (Findlen) not given 2000-01

213C. Undergraduate Colloquium: Power, Art, and Knowledge in Renaissance Italy—(Same as 313C.) What were the defining features of the society that gave us the idea and art of the Renaissance? The world of Leonardo, Machiavelli, and Michelangelo. The intersections of history, politics, art, and literature in the 15th and 16th centuries. The relationship between the Renaissance and the Reformation.

5 units (Findlen) not given 2000-01

215. Undergraduate Colloquium: Religion and Society in Early Modern Europe—Introduction to recent research on Christianity in early modern Europe, supplemented with primary sources. The dialectical relationship by which religion influenced other domains of human life, and was in turn influenced by them. Possible topics: religion in relationship to gender and family life, the Reformation in urban context, printing and literacy, oral and visual communication, individual and collective devotion, confession, and religious minorities. Readings are multinational and intercultural to acquaint students with the range and diversity of the phenomenon.

5 units (Gregory) not given 2000-01

216. Undergraduate Colloquium: When Worlds Collide—The Trial of Galileo—(Same as 316.) In 1633, the Italian mathematician Galileo was condemned by the Catholic Church for the heresy of believing the sun to be the center of the universe. Not until 1992 did the Catholic Church officially admit that Galileo was right. What does this highly publicized event tell us about the long and complex relationship between science and religion? Why has the Galileo affair continued to be one of...
THE different histories that can be produced from the historical encounter—See 28. Prerequisite: 28.

Europe and America—(Same as 327.) The diplomatic and military crises from the origins of WW I to the collapse of Yugoslavia. Readings include historical analyses and original documents.

MODERN EUROPE

227. Undergraduate Colloquium: War and Peace in the 20th Century—(Same as 327.) The diplomatic and military crises from the origins of WW I to the collapse of Yugoslavia. Readings include historical analyses and original documents.

5 units, Win (Findlen)


5 units (Kennedy, Sheehan) not given 2000-01

232A. Undergraduate Colloquium: Shopping—A History—European consumer culture from its inception in the 18th century to its increasing dominance of all aspects of life in the 20th century. Why have commodities come to play such an important part in our culture? How was the creation of the department store a watershed event in modern history? What are the politics of consumerism, from the bread riots of the French Revolution to the fashions of the 1920s? Emphasis is on the relation between gender and commodity culture, particularly the image of woman as family consumer and "kleptomaniac."

5 units, Aut (M. L. Roberts)


5 units (Robinson) not given 2000-01

238B. Undergraduate Colloquium: Marx, Darwin, and Freud—(Same as Interdisciplinary Studies in Humanities 191R.) Read/discuss the seminal works of the three most influential European thinkers of the modern era. Marx, Darwin, and Freud are the creators of powerful and distinctive intellectual systems (theories of society, nature, and the self) that invite comparison in terms of their structure and of their broad impact on life and thought.

5 units, Spr (Robinson)

238S. Undergraduate Research Seminar: Europe 1880-1918—The Fin de Siècle and the Great War—The period from 1880-1914 represents a transition from an optimistic, naive age to one that knew moral relativism, total war, material comfort, and great genius. Through art, fiction, autobiography, psychology, and cultural history, how the "age of innocence" ended and the 20th century began.

5 units (M. L. Roberts) not given 2000-01

HISTORY OF SCIENCE AND TECHNOLOGY

205. Undergraduate Colloquium: Bodies and Machines—From Descartes to Frankenstein—(Enroll in Science, Technology, and Society 131.)

3-5 units, Aut (Wilding)

206P. Undergraduate Colloquium: The Scientific Revolution—(Same as 306P; enroll in Science, Technology, and Society 123.)

5 units, Win (Gorman)

212. Before Babel—Knowledge and Communication in Early Modern Europe—(Enroll in Science, Technology, and Society 122.)

5 units, Spr (Wilding)

262S. Undergraduate Research Seminar: Science and High Technology in the Silicon Valley, 1930-1980—(Same as 462.) The techno-

logical, political, economic, and spatial dimensions of the rise of Silicon Valley from the 1930s to the early 1980s. How did Silicon Valley arise? What sustained its growth? How did it function? How did it evolve? Archival research and oral history. Focus is on radio tubes, microwave devices, semiconductors, and computers; economies of skills; university-industry relations; political dissent and the counterculture; and the techno-scientific policies of the Cold War state. Comparison with Route 128.

5 units, Aut (Lenoir)

274A. Undergraduate Colloquium: Body Works—Medicine, Technology, and the Body in Late 20th-Century America—(Same as 374A; English 263, Comparative Literature 274A.) The influence of new medical technologies (organ transplantation, endoscopic surgery, genetic engineering, computer-aided tomography, medical imaging) on the American imagination from WW II to the 1990s.

4-5 units, Win (Bender, Lenoir, Taylor)

BRITAIN

240. Undergraduate Colloquium: Shakespeare's London—The Social and Cultural Consequences of Growth—Between 1500 and 1700 London grew from a late medieval town of 50-60,000 to a metropolis of more than 500,000, the largest city in Western Europe. The problems such unprecedented growth generated, ranging from Crown attempts to limit and control growth to the city magistrates' measures to meet the needs of the growing number of the poor and sick. The official image the city presented in its Lord Mayor's shows and the image of urban life presented in the new popular theater.

WIM

5 units, Win (Seaver)

241S. Undergraduate Research Seminar: From Reformation to Revolution in Early Modern England—Sources for England from 16th-century Protestant Reformation to the civil wars and revolution in the mid-17th century are unusually rich. The types of records (private diaries and letters to the official proclamations, and state papers) define the question that shapes the investigation. Critiques of a draft of the research paper.

5 units, Spr (Seaver) not given 2000-01

242S. Undergraduate Research Seminar: Exploring Modern Britain through Documents and Images Held at Stanford—Students choose a British text, artifact, or picture from the Stanford collections from a preselected list and discover British society by writing about it.

5 units (Stansky) not given 2000-01

244. Undergraduate Colloquium: Britain, 1688-1832—(Same as 144.)

5 units (Stansky) not given 2000-01

245C. Undergraduate Colloquium: Modern Britain—(Same as 145C.)

5 units (Stansky) not given 2000-01

AFRICA

246. Undergraduate Colloquium: Successful Futures for Africa—An Inventory of the 1990s-2000s—(Same as 346.) With an Africa of crises and setbacks, the question arises as to whether African states and peoples are creating new visions of the future. If so, what are those ideas and experiments and are they viable? The research in the newest options, from the last decade.

5 units, Spr (Jackson)

246S. Undergraduate Research Seminar: Popular Culture in Africa—(Same as 446.) African culture rarely appears in historical research. The classics in this field; case-studies such as the role of the griot, women as diviners and seers, Euro-African dress and fashion, the image of Europeans in Africa, highlife music in Ghana, emblems in the Mau Mau rebellion, etc.

5 units (Jackson) not given 2000-01
247. Undergraduate Colloquium: Greater East Africa and Its Historical Writing—(Same as 347.) Greater E. Africa contains Kenya, Tanzania, Uganda, Ethiopia, parts of Zaire, and Mozambique. From this area has come a dynamic historical literature (especially about women, the colonial period, and the purpose of history). (WIM)

*5 units (Jackson) not given 2000-01*


*5 units (R. Roberts) not given 2000-01*

247B. Undergraduate Colloquium: Health and Society in Africa—The history of disease, therapeutic and diagnostic systems, and the definition of health in precolonial, colonial, and postcolonial Africa. The social and political histories of specific epidemics, including sleeping sickness, influenza, TB, mental illness, and AIDS. The colonial contexts of epidemics and the social consequences of disease.

*5 units (R. Roberts) not given 2000-01*

247C. Undergraduate Colloquium: Africa and African Americans since World War II—(Same as 347C.) The most intense, profound, and contradictory dialogue by African Americans on Africa has occurred since World War II, an event that unleashed new political forces in Black communities worldwide. The dialogue and the impact events in Africa (e.g., the 1950s-'60s surge of African nationalism, and the ascendency of Nelson Mandela) on Black American consciousness.

*5 units (Jackson) not given 2000-01*

247D. Undergraduate Colloquium: African Coiffure and Its Legacy in the Americas—(Same as 347D.) Offered in connection with the Cantor Museum exhibit on "Hair in African Art and Culture." The role played by hair notions and hair adornment in Africa, the inheritance of this hair culture in the New World, and the place of hair in black cultures as a repository of notions about personality, group politics, style, collective anxieties, art, and futurisms.

*4 units, Aut (Jackson)*

247S. Undergraduate Research Seminar: The Great Mau Mau Rebellion in 1950s Kenya—(Same as 447.) The Mau Mau rebellion in 1950s Kenya was significant and controversial. Within the last decade, literature has emerged to sort out the rebellion: novels, film, autobiographies, historical writing, and popular culture artifacts.

*5 units (Jackson) not given 2000-01*

248. Undergraduate Colloquium: Governance and Civil Society in Africa—Africa has been a laboratory for the experimentation of different forms of governance. The nature of power, authority, and the constitution of civil society in precolonial, colonial, and postcolonial Africa, e.g., sephalous societies to precolonial empires, from colonial policies of indirect rule to colonial efforts to orchestrate a transition to independence, postcolonial experiments in democracy, socialism, and military rule. Postcolonial transitions to democracy and the persistence of precolonial models of governance in the independence era. Taught in a simultaneous web-based environment with faculty and students from UC-Berkeley.

*5 units, Win (R. Roberts)*

248A. Undergraduate Colloquium: The End of Slavery in Africa and the Americas—(Same as 348A.) Comparative social history of the end of slavery in the Caribbean, the American South, and Africa. Interpretations of the social transformations. Topics: motivations for abolition of slavery, meanings of freedom in different societies, and processes of adaptation to new political economies of work.

*5 units (R. Roberts) not given 2000-01*

248B. Undergraduate Colloquium: Law and Colonialism in Africa—(Same as 348B.) Law in colonial Africa provides an opportunity to examine the meanings of social, cultural, and economic change in the anthropological, legal, and historical approaches. Court cases are a new frontier for the social history of Africa. Topics: meanings of conflicts over marriage, divorce, inheritance, property, and authority.

*5 units (R. Roberts) not given 2000-01*

248S. Undergraduate Research Seminar: Colonial States and Societies in Africa—(Same as 448A.) Students examine the encounter between African societies and European colonialism in the colony or region of their choice. Approaches to the colonial state; tours of primary source collections in the Hoover Institution and Green Libraries. Students present their original research findings and may continue research for a second quarter.

*5 units, Win, Spr (R. Roberts)*

249A. Undergraduate Colloquium: The Issue of Greatness in Black History—(Same as 349A.) A major tension in the writing of Black history is between the public demand for greatness, achievements, monuments, and firsts, and the academic historian’s skepticism about this approach. Why greatness is thought essential in Black mass history and how academic historians have reacted to this pressure.

*5 units (Jackson) not given 2000-01*

249B. Undergraduate Colloquium: Black Visual Arts and Black History—(Same as 349B.) The subject matter of the Black past has been used repeatedly in the Black visual arts in this century. From the 1920s-'30s works of Aaron Douglass, Jacob Lawrence, and Lois Mailou Jones to the 1990s works represented in the avant-garde Paris-based Revue Noire, Black visual artists have wrestled with the problem of how "to show" the Black past. Case studies of artists from African-America, Africa, and the Caribbean. Original research by students is encouraged in this unexamined field.

*5 units (Jackson) not given 2000-01*

249D. Undergraduate Colloquium: African Cultural History in the 20th Century—(Same as 349D.) Popular culture in Africa and the cultural products of African intellectuals. Emphasis is on pathbreaking popular culture and avant-garde intellectual cultures—those instances that created a sense of the "new" over the 20th century. Primary sources research.

*5 units, Win (Jackson)*

THE UNITED STATES

250. Undergraduate Colloquium: American Popular Culture—The development and evolution of popular culture in the U.S. The 19th-century emergence of blackface minstrelsy and popular entertainments such as domestic fiction (authored primarily by women), vaudeville and musical theater, dime novels, early film, and jazz. Emphasis is on race, class, and gender analyses.

*5 units, Win (M. Thompson)*

250B. Undergraduate Colloquium: Constitutional Interpretation in History and Theory—Problems of enumerating, defining, justifying, and protecting constitutional rights; the adoption of the Bill of Rights and the 14th Amendment; 20th-century controversies over incorporation, equality, and autonomy; and the contemporary debate over "rights talk."

*5 units, Win (Rakove)*

250C. Undergraduate Colloquium: Thomas Jefferson and His World—The multiple facts of Jefferson’s life; his views of politics and society, constitutions and revolutions, nation and state, Old World and New, slavery and race; his place in the national memory; and the problem of passing moral judgments on historical actors. Extensive readings in primary and secondary sources.

*5 units (Rakove) not given 2000-01*
251A.B. Undergraduate Colloquium: Poverty and Homelessness in America—Students participate in an internship with the Emergency Housing Consortium, the primary agency providing shelter for homeless people in Santa Clara and San Mateo counties, while learning about homelessness and poverty through required readings/discussions. Prerequisite: interview with the instructor.
8 units (Camarillo) not given 2000-01

252. Undergraduate Colloquium: Decision-Making in International Crises—The A-bomb, the Korean War, and the Cuban Missile Crisis—(Same as 352.) For advanced undergraduates and graduate students. Integrates primary documents and secondary literature to understand the three sets of events.
5 units, Aut (Bernstein)

252S. Undergraduate Research Seminar: Museums and History—How museums and historic sites have interpreted the past. The history of museums, the relationship of academic scholarship to popular exhibition, the politics of public memory, and the effect of museum display on the meaning of objects. Required field trips.
5 units (M. Thompson) not given 2000-01

253. Undergraduate Colloquium: Topics in African American History—The Great Migration—Focus is on the massive movement of African Americans from the rural south to the urban north from Reconstruction through WW I. The motivations for and consequences of this migration. Topics: urbanization, immigration, class dynamics within the African American community, gender roles, race progress and leadership, color consciousness, and the emergence of African American urban culture.
5 units (M. Thompson) not given 2000-01

254. Undergraduate Colloquium: Nature—The natural and the social are very hard to disentangle. When Americans have written about nature, they revealed much about what they thought about society. How Americans have constructed nature and “nature’s nation” by examining some classic American texts from Thomas Jefferson’s Notes on the State of Virginia through Rachel Carson’s Silent Spring. How ideas about the social order, the economy, racial relations, etc., are often embedded in discussions of the natural world.
5 units (White) not given 2000-01

254S. Undergraduate Research Seminar: U.S. Women’s History—For History or Feminist Studies majors only. Students learn bibliographic, research, and writing skills through the study of 20th-century women’s reform efforts, utilizing primary sources available in Green Library and culminating in a substantial research paper. Prerequisite: at least one U.S. history course, consent of instructor. Recommended: 173B.
5 units (Freedman) not given 2000-01

255. Undergraduate Colloquium: The History of Multiraciality in America—In the 21st century, multiracialism and multiculturalism are increasingly common and publicly debated. The historical origins of America’s multiracial and multicultural roots and experiences. The major themes and issues surrounding intermarriage, miscegenation, interracial sex, biraciality, mixed-heritage, multiracial identity, and multicultural communities of the African American, Asian American, Chicano/Mexican American, and Native American Indian people. The growing presence of people of mixed-cultural heritage and multiraciality of America is examined through the interplay of growing cultural and social similarities and through the context of persisting inequalities by race, gender, class, and culture.
5 units, Aut (Pang)

255A. Undergraduate Colloquium: Culture and Ideologies of Race—(Same as 355A.) How culture is used to create, reify, and subvert categories of race in the U.S. The processes of cultural exchange and contestation which forge and dismantle racialized identities. Topics: the uses of memory and nostalgia, the introduction of new cultural technologies, and gender and class as categories which define and are defined by race.
5 units, Aut (M. Thompson)

255S. Undergraduate Research Seminar: African American History—Liberation Curriculum Workshop—As part of a cooperative effort of Stanford University’s King Papers Project and the Oakland Unified School district’s Urban Dreams Project, students assist the King Project’s staff and Oakland school teachers in the creation of the Liberation Curriculum, a set of web-based, age-specific, educational materials based on the modern African-American freedom struggle.
5 units, Aut (Carson)

256. Undergraduate Colloquium: Topics in Mexican American History—(Same as 356.) Topics from the 19th and 20th-century: immigration from Mexico, the Americanization of Mexican society in the Southwest, the Mexican working class, intra-ethnic conflict, the Chicano movement of the 1960s, the making of barrios, the role of Mexican American women, etc. Focus is on the 20th century. GER:4b (DR:3)
5 units (Camarillo) not given 2000-01

257. Undergraduate Colloquium: Immigrants and Racial Minorities in American Cities—Comparative Perspectives—The urbanization of major ethnic immigrant and racial minority groups in American cities during the 20th century. Historical case studies of different groups, and social science theories and historical interpretations. The urban histories of Euro-Americans, African Americans, Mexican Americans, Asian Americans, and Native Americans in comparative perspective.
5 units (Carson) not given 2000-01

258. Undergraduate Colloquium: Modern America in Historical Perspective—The historical roots of several issues in contemporary American society: changing patterns of income distribution, the legacy of the “Great Society” and Reagan-era policies, the evolution of political parties, the changing situation of women, race relations, and immigration. Recommended: background in 20th-century American history.
5 units (Kennedy) not given 2000-01

259. Undergraduate Colloquium: Race and Ethnicity in the United States and South Africa—(Same as 359.) The comparative history of black-white relations in the U.S. and S. Africa. Topics: white racist ideologic patterns of segregation, Ethiopanism, Pan-Africanism and the Garvey Movement, nonviolent protest, and Black Power/Black consciousness. Prerequisite: 157 or 164, or equivalent.
5 units (Fredrickson) not given 2000-01

259S. Undergraduate Research Seminar: The United States and the Vietnam War
5 units (Chang) not given 2000-01

260A. Undergraduate Colloquium: Perspectives on American Identity—(Same as American Studies 200.) Analysis of the changing interpretations of American identity and “Americanness.” (WIM) GER:3a (DR:8)
5 units, Spr (J. Corn)

5 units, Aut (Gilliam)

261. Undergraduate Colloquium: Nuclear Weapons and International Relations—Theories and History—(Same as 361.) Case studies involving nuclear weapons and related international relations theory.
5 units (Bernstein, Holloway) not given 2000-01
262S. Undergraduate Research Seminar: Science and High Technology in Silicon Valley, 1930-1980.—(Same as 462.) See “History of Science and Technology” above.

5 units (Lenoir)

263A. Undergraduate Colloquium: The Automobile Industry in 20th-Century America.—One of the nation’s major industries is examined from the perspective of its products, workers, and wide-ranging influences. Topics: the origins and consequences of the industry's geographical concentration in Michigan; the evolution of assembly line work and other forms of automotive labor; the influence of automobiles on the built and natural environments; cars and government regulation; and recent changes to the industry stemming from technological change, foreign competition, and environmentalism.

5 units (Corn) not given 2000-01

264S. Undergraduate Research Seminar: Martin Luther King, Jr. and the Modern Civil Rights Movement.—Supervised research projects use the resources of the King Papers Project at Stanford.

5 units (Carson) not given 2000-01

265. Undergraduate Colloquium: New Research in Asian American History.—(Same as 365.) Asian American studies is a rapidly developing field, with new narrative material and methodologies. Newly published studies in history and related disciplines. Discussion of texts and exploration of possible research work. Recommended: previous exposure to Asian American studies.

5 units (Chang) not given 2000-01

265A. Undergraduate Colloquium: The History of Sexuality in the United States.—(Same as 365A.) Priority to History and Feminist Studies majors; a limited number of graduate students may be admitted. Readings on the social construction of sexuality, primarily U.S., in the 19th and 20th centuries. Topics: reproduction, sexual identities, and race and sexuality. Prerequisite: consent of instructor.

5 units, Spr (Freedman)

267. Undergraduate Colloquium: Yesterday's Tomorrows—Technology and the "Future" in History.—The changing American expectations regarding the development and consequences of science and technology in the future. Topics: the emergence of a culture of prognostication in the late 19th century (Edward Bellamy, H. G. Wells); the turn-of-the-century reception of new communications technologies; 1930s world’s fairs and Depression “futures”; the 1960s, “technology assessment,” and anti-technology (“the future isn’t what it used to be”).

5 units (Corn) not given 2000-01

269. Undergraduate Colloquium: The African-American Community Organizing Tradition.—(Same as 369.) Because the political rights of African-Americans have often been restricted, black people have developed innovative ways of mobilizing their collective power to achieve group advancement. The history of modern African-American grassroots movements and the organizing techniques that have enabled people without many resources to liberate themselves. Focus is on the Student Nonviolent Coordinating Committee (SNCC), the Southern Christian Leadership Conference (SCLC), the Black Panther Party (BPP), etc.

5 units (Carson) not given 2000-01

270S. Undergraduate Research Seminar: North American Wests.—The modern American West is a recent historical creation dependent on the emergence of the nation states of Canada, the U.S., and Mexico. It is the product of processes of migration, state formation, new technologies, capital flows, and environmental changes still at work in N. America. The emergence of the American West in regional terms vis-a-vis the East, and in relation to Mexico, Canada, Indian nations, and the larger world of the Pacific Rim.

5 units, Spr (White)

272A. Undergraduate Colloquium: War and Society, 1941-68.—Briefly considers WW II. The focus is on the early Cold War and the Vietnam War: dissent and the impact of the “national-defense system” on major domestic institutions, and their relationships to American culture.

Readings: John Dower, Paul Fussell, George Kennan, Dwight Macdonald, Robert McNamara, bringing together different approaches from International Relations and American Studies.

5 units (Bernstein) not given 2000-01

274A. Undergraduate Colloquium: Body Works—Medicine, Technology, and the Body in Late 20th-Century America.—(Same as English 263, History 374A, Comparative Literature 274A.) See “History of Science and Technology” above.

4-5 units, Win (Bender, Lenoir, Taylor)

LATIN AMERICA

276. Undergraduate Colloquium: The Creation of North America.—(Same as 376.) Responding to rapid changes in the world economy, Canada, the U.S., and Mexico are developing common interests in a shared regional space. This convergence is transforming relations between three sovereign states, each with its distinct political system, national history, cultures, and identities. The historical origins of the convergence, from the clash of European empires and native societies, to the development of viable nation states in Canada and Mexico as influenced by the American Civil War and the intersecting of frontiers and railroads, and the effects of WW II through the movement of peoples and development of complex identities today.

5 units (Wirth) not given 2000-01

277. Undergraduate Colloquium: History and Public Policy—The Political Economy of Economic Growth.—How have different countries in the Americas created different systems to regulate economic development? What effects have these regulatory systems had on the course of growth? What are the political reasons that explain why different countries have regulated economic activity in different ways? These interrelated questions are addressed through the study of regulation and its impact in Brazil, Mexico, and the U.S., drawing on the literatures of law and economics, development economics, political economy, and economic history.

5 units, Aut (Lopez-Alonso)

278. Undergraduate Colloquium: Historical Aspects of Underdevelopment in Latin America.—The methods and approaches of economic history. Emphasis is on the critical analysis of scholarly studies of issues in Latin American economic growth addressed by economic historians, including the creation of national transport systems, the growth of industry, the economies of slavery, and the long-term effects of export oriented growth.

5 units (Haber) not given 2000-01

279. Undergraduate Colloquium: Latin American Development: Economy and Society, 1800-2000.—The newly independent nations of Latin America began the 19th century with economies roughly equal to, or even ahead of, the U.S. and Canada. By 1900, an enormous economic gap had grown between these two regions. What explains this divergence in economic development? Why are some Latin American nations relatively rich and others so poor? Why is income so poorly distributed throughout most of the region? The interpretive frameworks are Marxist, dependency, neoclassical, and institutionalist. The effects of "globalization" on Latin America’s economic growth, autonomy, and potential for social justice.

5 units, Win (Frank)

280. Undergraduate Colloquium: Modern Mexico.—Interdisciplinary analysis of Mexico since the Revolution of 1910. Studies of political economy written by historians, economists, anthropologists, and novelists. Recommended: prior study of Latin American history, politics, or economic development.

5 units (Staff) not given 2000-01
JEWISH HISTORY

281. The Family in Latin America—The history of the Latin American family. Colonialism and family structure interacted in diverse ways depending on, e.g., social class, region, and ethnicity. During the 19th century, political independence, nation-state formation, immigration, and economic development radically transformed the context within which families existed. In the 20th century, families succumbed to the modern solvents of mobility and divorce, and, in business and politics to impersonal corporations, bureaucracies, and political systems. Readings in scholarly texts and literary sources; emphasis is on the shifting, variegated role of class and gender in Latin American families.

5 units, Win (Frank)

281A. Undergraduate Colloquium: Environmental History of the Americas—(Same as 381A.) Environmental history is approached topically, using examples from N. and S. America to survey and evaluate the current state of research.

5 units, Spr (Wirth)

282. Undergraduate Colloquium: The Agrarian Origins of Underdevelopment in Latin America—(Same as 382.) Introduction to the study of Latin American agrarian economic history. The relationship between the productive organization of agriculture and long run economic growth, focusing on Mexico during the 18th, 19th, and 20th centuries. Works by development economists, social historians, and economic historians.

5 units, Spr (Summerhill)

283. Undergraduate Colloquium: The Process of Industrialization—Europe, the United States, and Latin America—(Same as 383.) Introduction to comparative economic history for graduate students. The literature on the transition to industrial societies during the 19th and 20th centuries in a variety of national contexts. Readings from the institutionalist, cliometric, and Marxist schools of economic history.

5 units (Haber) not given 2000-01

285A. Undergraduate Colloquium: Jewish Biography in the 19th and 20th Centuries—(Same as 385.) How one examines history through the prism of biographical writing. A wide range of biographical literature seeks to illuminate the texture of Jewish life in the last two centuries, including writing on the obscure and famous, men and women, the pious and the secular, the assimilated and the assertive Jews. An exploration of the lives of Sephardic and Ashkenazic Jews. (WIM)

5 units, Win (Zipperstein)

287A. Undergraduate Colloquium: Modern Jewish Identity—(Same as 387A.)

5 units (Rodrigue) not given 2000-01

289B. Undergraduate Colloquium: Zionism and its Critics—(Same as 389B.) The major texts produced by the Zionist movement, emphasizing its early years between the 1880s and the 1917 Balfour Declaration. One of a range of forces in Jewish politics, Zionism was subjected to sustained scrutiny by orthodox Jews, liberals, socialists, etc. The movement and the criticisms engendered by it, within and beyond the Jewish world, especially in prestate Palestine.

5 units (Zipperstein) not given 2000-01

MIDDLE EAST

285A. Undergraduate Colloquium: Problems in Israeli History—The National Identity and Political Culture of the Israeli State—Focus is on ideology, institutions, and politics. Themes: Zionism, non-Zionism, and anti-Zionism; religion and secularism; multi-ethnicism; socialism; symbols; law.

5 units (Mancall) not given 2000-01

286. Undergraduate Colloquium: Economic and Social History of the Modern Middle East—(Same as 386.) The integration of the Middle East into the world capitalist market on a subordinate basis and the impact on economic development, class formation, and politics. Alternative theoretical perspectives on the rise and expansion of the international capitalist market are combined with possible case studies of Egypt, Iraq, and Palestine.

5 units, Spr (Beinin)

287S. Undergraduate Research Seminar: Topics in the Modern History of Egypt, Palestine, and Israel—(Same as 487.) Student-selected research topics with guided historiographical reading and discussions as an introduction.

5 units (Beinin) not given 2000-01

288. Undergraduate Colloquium: Palestine and the Arab-Israeli Conflict—(Same as 388.) The Palestine-Zionist conflict 1882 to the present through reading and comparing representative expressions of competing historical interpretations. U.S. policy towards the conflict since 1948. (WIM)

5 units, Aut (Beinin)

289. Undergraduate Colloquium: Islamic Reform on the Eve of Modernity—(Same as 389.) An examination of the major Islamic movements and the major themes addressed by Muslim thinkers in the early modern period. Emphasis is on Islamic networks and regional movements, questions of continuity in the Islamic intellectual traditions, and European influence on Islamic reformatory thought. (WIM)

5 units, Win (Dallal)

289A. Undergraduate Colloquium: The Ottoman Empire—(Same as 389A.) The rise of the Ottoman Empire from the 14th to 16th centuries. The Balkans and the Middle East under Ottoman rule. Systems of governance and the economy of the Ottoman Levant. The onset of weakness and decline after the 17th century. European imperialism in the Middle East. Ottoman westernizing reforms in the 19th century. The rise of nationalism. The Balkan Wars, WW I, and the collapse of the Ottoman Empire.

5 units (Rodrigue) not given 2000-01

290. Undergraduate Colloquium: Science in the Islamic World—The origins, development, and cultural significance of science in the Islamic World. Emphasis is on the world view and achievements of individual scientists, issues of progress and decline, and the special role of science in an Islamic religious and political context.

5 units, Aut (Dallal)

EAST ASIA

291A. Undergraduate Colloquium: The Chinese Revolution—Key passages in China's revolutionary struggle, beginning with Sun Yat-sen and the 1911 Revolution and ending with the pro-democracy movement and events at Tiananmen in 1989. The May 4th Movement, Chiang Kai-
ske's National Revolution of 1925-27, Mao Zedong's peasant-based Communist revolution, and the Cultural Revolution are explored from social, cultural, and political perspectives. First-person accounts, e.g., Edgar Snow's *Red Star Over China*, primary documents, classic and revisionist scholar works, Chinese literature in translation, and films, e.g., *Yellow Earth* and *Farewell, My Concubine.*

5 units (R. Thompson) not given 2000-01

292. Undergraduate Colloquium: Postwar Japan—(Same as 392.) Discussion of various aspects of Japanese social history since 1945: the postwar emperor system, economic growth and urbanization, middle class culture, new religions, citizens' movements, the transformation of village life, the search for national identity, and popular media.

5 units (Duus) not given 2000-01


5 units (Duus) not given 2000-01

292B. Undergraduate Colloquium: Aspects of Chinese Economic History from the High Middle Ages to Modern Times—Premise: economic information changes in meaning as history moves into different social formations. Where the ancient imperial state left its agrarian imprint on land formations and ownership patterns, 1,000 years of growth and the development of commerce, the emergence of complex systems of land ownership and tenancy, the appearance in late imperial and early modern times of demographic problems, questions of agrarian stagnation, rural commercialization, and the beginnings of an industrial economy.

5 units (Kahn) not given 2000-01

292S. Undergraduate Research Seminar: Creating Modern China—From Empire to Nation in the Age of Imperialism—80 years of transformation. A voluminous documentary record in Western languages is part of the legacy of the "opening" of the countryside in 1860 to missionaries and the growing number of "treaty ports" inhabited by diplomats and businessmen. Students use primary sources (diplomatic records, newspapers, Chinese material in translation, and archival documents) to write original research papers. Prerequisite: 295D, or consent of instructor.

5 units (R. Thompson) not given 2000-01

2926. Undergraduate Colloquium: Ordinary Lives—The Social History of Early Modern China—Ways of studying people who were not prominent in the conventional spheres of authority or high culture. Topics: migrations, disease, production and consumption, gender and family, popular culture and entertainments, the politics of banditry, etc., during Ming-Qing (16th-19th centuries). Prerequisite: consent of instructor. GER:4a (DR:2)

5 units (Kahn) not given 2000-01

2928. Undergraduate Colloquium: Imperialism, Colonialism, and National Identity in Modern Japan—(Same as 398.) The linkages between state building, economic change, territorial expansion, and national consciousness in late 19th- and early 20th-century Japan. Topics: the construction of race, the alien and the barbarian; the nature of the modern Japanese state; the economic roots of territorial expansion; styles and schemes of colonial domination and management; debates on Japan's relationships with Asia, the West, and its colonial subjects.

5 units (Duus) not given 2000-01

2928A. Undergraduate Colloquium: Visions of Utopia—Travelers to China, 9th-20th Century

5 units (Kahn) not given 2000-01

2929. Undergraduate Colloquium: Japan in the Age of Courtiers and Warriors, 1180-1333—Government and society during the period of Japan's transition from its classical to its medieval phase. Topics: law, justice, family, inheritance, war, religion, and the economy through the analysis of primary documents, chronicles, and sources in translation.

5 units, Win (Mass)

GRADUATE

300W. Graduate Directed Reading
units by arrangement (Staff)

GENERAL

301. Graduate Colloquium: Historiography of American Education—(Same as Education 301.) Analysis of the literature of American education history for students who wish to do further work in the field. Weekly discussions, plus an opportunity to pursue specialized topics in small group tutorial sessions. Limited enrollment. Prerequisite: consent of instructor.

3-4 units (Williamson) given 2001-02

301C. Graduate Colloquium: Early Greece
4-5 units (Morris) not given 2000-01

301F. Graduate Colloquium: 20th-Century Turkey, Iran, and Pakistan—(Same as 201F.)

5 units (Simons) not given 2000-01

302. Graduate Colloquium: Problems in Modern British History—Using British material, introduces students to three aspects of being a professional historian: the nature of professional journals, the writing of dissertation/grant proposals, and what it means to change a dissertation into a book.

5 units, Win (Stansky)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Term</th>
<th>Instructor(s)</th>
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</thead>
<tbody>
<tr>
<td>302A</td>
<td>Graduate Colloquium: Introduction to Problems of Historical Interpretation</td>
<td>4-5</td>
<td>Spr</td>
<td>Emmons</td>
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<tr>
<td></td>
<td>and Explanation—(Same as 202.)</td>
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<tr>
<td>304</td>
<td>Approaches to History—Required of all first-year History Ph.D. students.</td>
<td>1-3</td>
<td>Aut</td>
<td>Lougee-Chappell</td>
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<tr>
<td>304A</td>
<td>Graduate Colloquium: Critical Studies—Science, Language, and Culture—</td>
<td>4-5</td>
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<td>Haber</td>
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<tr>
<td></td>
<td>Critical approach to theoretical issues at the intersection of science,</td>
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<tr>
<td></td>
<td>language, and culture. Topics: structuralism, post-structuralism,</td>
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<td>sociology of scientific knowledge, anthropology of science, feminism,</td>
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<td></td>
<td>cultural studies, postmodernism, and postcolonialism. Readings: Saussure,</td>
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<td></td>
<td>Wittgenstein, Derrida, Foucault, Bourdieu, Butler, Haraway, Latour,</td>
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<td></td>
<td>Baudrillard, and Deleuze. Recent issues: virtuality, chaos, complexity, and</td>
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<td>constitution of the subject.</td>
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<tr>
<td>305</td>
<td>Graduate Workshop in Teaching—Introduction to teaching, lecturing, and</td>
<td>1</td>
<td>Spr</td>
<td>R. Roberts</td>
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<td></td>
<td>curriculum development.</td>
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<td>306</td>
<td>Graduate Colloquium: The Logic of History—(Same as 206.)</td>
<td>4-5</td>
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<tr>
<td>306A</td>
<td>Graduate Colloquium: The Modern Tradition—Capitalism, Imperialism, and</td>
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<td></td>
<td>their Critics—The tradition of social theory, beginning with Marx’s concept</td>
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<td>of capitalism and Lenin’s theory of imperialism, is elaborated by examining</td>
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<td>works arguing that gender and racial hierarchies are constitutive of</td>
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<td>capitalism. The dimensions of ideological and cultural domination, using the</td>
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<td>writings of Marx, Gramsci, and representatives of the cultural studies and</td>
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<td>subaltern studies schools including Start Hall, Gyan Prakash, Edward Said,</td>
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<td>and Paul Gilroy. The debate over postmodernism/late capitalism, and theory</td>
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<td>and strategy after the Gulf War.</td>
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<tr>
<td>306B</td>
<td>Design and Methodology for International Field Research—(Same as 206B.)</td>
<td>1</td>
<td>Win</td>
<td>Kollmann, R.</td>
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<td></td>
<td>Roberts</td>
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<td>306C</td>
<td>History Wired—Overview, theoretical and applied, of electronic media as</td>
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<td></td>
<td>they relate to the various disciplines of historical research and teaching.</td>
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<tr>
<td>306P</td>
<td>The Scientific Revolution—(Same as 206P.)</td>
<td>4-5</td>
<td>Win</td>
<td>Gorman</td>
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<td></td>
<td>EASTERN EUROPE AND RUSSIA</td>
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<td>320A</td>
<td>Graduate Colloquium: Topics in Early Modern Russian History</td>
<td>4-5</td>
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<td>Kollmann</td>
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<td></td>
<td>(Same as 207.)</td>
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<tr>
<td>320B</td>
<td>Graduate Colloquium: Topics in Imperial Russian History</td>
<td>4-5</td>
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<td>Emmons</td>
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<td>(Same as 209B.)</td>
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<td>320C</td>
<td>Graduate Colloquium: Topics in 20th-Century Russian and Soviet History</td>
<td>4-5</td>
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<td>Weiner</td>
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<td>(Same as 215.)</td>
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<tr>
<td>321A</td>
<td>Graduate Colloquium: Topics in Early Modern Russian Historiography</td>
<td>4-5</td>
<td>Aut</td>
<td>Kollmann</td>
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<td>321B</td>
<td>Graduate Colloquium: Topics in Modern Russian Historiography</td>
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<td>(Same as 219B.)</td>
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<td>321C</td>
<td>Graduate Colloquium: Historiography of the Soviet Union—</td>
<td>4-5</td>
<td>Win</td>
<td>Weiner</td>
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<td>(Same as 221C.)</td>
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<td>MIDDLE EAST AND EARLY MODERN EUROPE</td>
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<td>322A</td>
<td>Graduate Colloquium: Myths and Identities in Modern Ukraine—(Same as 222A.)</td>
<td>4-5</td>
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<td>Weiner</td>
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<td>(Same as 222A.)</td>
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<td>323</td>
<td>Graduate Colloquium: Honor, the Law, and Modernity in Early Modern Europe—</td>
<td>4-5</td>
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<td>Kollmann</td>
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<td>(Same as 223.)</td>
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<td>324</td>
<td>Graduate Colloquium: Stalinism in Eastern Europe—(Same as 224.)</td>
<td>4-5</td>
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<td>325</td>
<td>Graduate Colloquium: The Russian Revolutionary Tradition—(Same as 225.)</td>
<td>4-5</td>
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<td>326</td>
<td>Graduate Colloquium: Modernity, Revolution, and Totalitarianism—(Same as</td>
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<td>327</td>
<td>Graduate Colloquium: The Scientific Revolution—(Same as 206P.)</td>
<td>4-5</td>
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<tr>
<td>330A</td>
<td>Graduate Core Colloquium in Medieval European History—(Same as 207.)</td>
<td>5</td>
<td>Win</td>
<td>Miller</td>
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<tr>
<td>330B</td>
<td>Graduate Core Colloquium in Medieval European History—(Same as 209B.)</td>
<td>4-5</td>
<td></td>
<td>Miller</td>
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<td>330C</td>
<td>Graduate Colloquium: Crusades, Pilgrimages, and Voyages of Discovery—The</td>
<td>4-5</td>
<td>Win</td>
<td>Miller</td>
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<td></td>
<td>Expansion of Medieval Europe—(Same as 209B.)</td>
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<td>330D</td>
<td>Graduate Colloquium: The Language of Politics in the Middle Ages—(Same as</td>
<td>4-5</td>
<td>Buc</td>
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<td>210A.)</td>
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<td>331</td>
<td>Graduate Colloquium: Body, Gender, and Society in Medieval Europe—(Same as</td>
<td>4-5</td>
<td>Spr</td>
<td>Buc</td>
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<td>211.)</td>
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<td>332A</td>
<td>Graduate Colloquium: New Worlds, Imaginary Worlds—(Same as 213A.)</td>
<td>4-5</td>
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<td>Findlen</td>
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<td>(Same as 213A.)</td>
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<td>332B</td>
<td>Graduate Colloquium: Heretics, Prostitutes, and Merchants—Venice and its</td>
<td>4-5</td>
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<td>Findlen</td>
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<td>Empire—(Same as 213B.)</td>
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<td>333C</td>
<td>Graduate Colloquium: Power, Art, and Knowledge in Renaissance Italy—(Same as</td>
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<td>213C.)</td>
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<td>335A</td>
<td>Graduate Colloquium: Topics in Reformation History—(Same as 215A.)</td>
<td>4-5</td>
<td></td>
<td>Gregory</td>
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<td>(Same as 215A.)</td>
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<tr>
<td>336</td>
<td>Graduate Colloquium: When Worlds Collide—The Trial of Galileo—(Same as 216.)</td>
<td>5</td>
<td>Win</td>
<td>Findlen</td>
</tr>
</tbody>
</table>
316A. Graduate Core Colloquium: Europe in the 15th and 16th Centuries  
4-5 units, Win (Gregory)

316B. Graduate Core Colloquium: Europe in the 17th and 18th Centuries  
4-5 units (Baker, Lougee-Chappell) not given 2000-01

WESTERN EUROPE

327. Graduate Colloquium: War and Peace in the 20th Century—  
(Same as 227.)  
4-5 units (Sheehan) not given 2000-01

328A. Graduate Colloquium: Problems in German Historiography  
4-5 units (Sheehan) not given 2000-01

330A. Graduate Colloquium: The French Revolution  
4-5 units (Baker) not given 2000-01

331C. Graduate Core Colloquium on Modern Europe: Enlightenment to Revolution  
4-5 units, Aut (Baker, Bien)

331D. Graduate Core Colloquium on Modern Europe: Intellectual History  
4-5 units (Robinson) not given 2000-01

331E. Graduate Core Colloquium on Modern Europe: Enlightenment to Revolution  
4-5 units, Aut (Baker, Bien)

331G. Graduate Core Colloquium on Modern Europe  
4-5 units (Naimark) not given 2000-01

332. Graduate Colloquium: Culture and Politics in Modern France  
4-5 units (M. L. Roberts) not given 2000-01

334. European Economic History—(Enroll in Economics 227.)  
5 units, not given 2000-01

HISTORY OF SCIENCE AND TECHNOLOGY

306P. The Scientific Revolution—(Same as 206P.)  
4-5 units, Win (Gorman)

333. The Darwinian Revolution—(Same as 133.)  
2-4 units (Lenoir) not given 2000-01

374A. Graduate Colloquium: Body Works—Medicine, Technology,  
and the Body in late 20th-Century America—(Same as English 263,  
History 274A, Comparative Literature 274A.)  
4-5 units, Win (Bender, Lenoir, Taylor)

AFRICA

346. Graduate Colloquium: Successful Futures for Africa—An Inventory of the 1990s-2000s—(Same as 246.)  
5 units, Spr (Jackson)
359. Graduate Colloquium: Race and Ethnicity in the United States and South Africa—(Same as 259.)

4-5 units (Fredrickson) not given 2000-01

361. Graduate Colloquium: Nuclear Weapons and International Relations—Theories and History—(Same as 261.)

4-5 units (Bernstein, Holloway) not given 2000-01

365. Graduate Colloquium: New Research in Asian American History—(Same as 265.)

4-5 units (Chang) not given 2000-01

365A. Graduate Colloquium: The History of Sexuality in the United States—(Same as 265A.)

4-5 units, Spr (Freedman)

367. Problems in American Economic History—(Enroll in Economics 226.)

5 units, Aut (David)

369. Graduate Colloquium: The African-American Community Organizing Tradition—(Same as 269.)

4-5 units, Win (Wirth)

372. Graduate Colloquium: Creating the American Republic—(Same as 272.)

4-5 units (Rakove) not given 2000-01

LATIN AMERICA

376. Graduate Colloquium: The Creation of North America—(Same as 276.)

4-5 units (Wirth) not given 2000-01

377. Graduate Colloquium: History and Public Policy—The Political Economy of Economic Growth

4-5 units (Haber) not given 2000-01

378. Frontiers, Backlands, and Boundaries in Latin America—The history of frontier development in Latin America from encounter and conquest to the present. Emphasis is on the struggle for land, relations between settlers and indigenous peoples, and environmental history. When frontiers have “closed,” there remain vast regions cut off from city and coast. These backlands form an important part of the political economy of Latin America and play a critical part in the imagery and ideology of nation-state formation. The boundaries between these states have been sites of conflict; and the tissue through which people and ideas have crossed. Emphasis is on the frontiers, backlands, and boundaries in Mexico, Brazil, and Argentina.

5 units, Spr (Frank)

381A. Graduate Colloquium: Environmental History of the Americas—(Same as 281A.)

4-5 units, Spr (Wirth)

382. Graduate Colloquium: The Agrarian Origins of Underdevelopment in Latin America—(Same as 282.)

4-5 units, Spr (Summerhill)

383. Graduate Colloquium: The Process of Industrialization—Europe, the United States, and Latin America—(Same as 283.)

4-5 units (Haber) not given 2000-01

JEFFISH HISTORY

384A. Graduate Core Colloquium in Jewish History, 17th-19th Centuries

4-5 units, Aut (Rodrigue)

384B. Graduate Core Colloquium in Jewish History, 20th Century

4-5 units (Zipperstein) not given 2000-01

385. Graduate Colloquium: Jewish Biography in the 19th and 20th Centuries—(Same as 285.)

5 units, Win (Zipperstein)

387. Graduate Colloquium: The Jews of Russia—(Same as 287.)

5 units, Spr (Zipperstein)

387A. Graduate Colloquium: Modern Jewish Identity—(Same as 287A.)

4-5 units (Rodrigue) not given 2000-01

MIDDLE EAST

386. Graduate Colloquium: Economic and Social History of the Modern Middle East—(Same as 286.)

4-5 units, Spr (Beinin)

388. Graduate Colloquium: Palestine and the Arab-Israeli Conflict—(Same as 288.)

4-5 units, Aut (Beinin)

389. Graduate Colloquium: Islamic Reform on the Eve of Modernity—(Same as 289.)

5 units, Win (Dallal)

389A. Graduate Colloquium: The Ottoman Empire—(Same as 289A.)

4-5 units (Rodrigue) not given 2000-01

389B. Graduate Colloquium: Zionism and Its Critics—(Same as 289B.)

5 units (Zipperstein) not given 2000-01

EAST ASIA

390A. Graduate Colloquium: Topics in Middle-Period Chinese History

5 units, Win (Neskar) not given 2000-01

390B. Graduate Colloquium: Topics in Late Traditional Chinese History

4-5 units, Win (Kahn)

390C. Graduate Colloquium: Topics in Modern Chinese History

4-5 units, Win (R. Thompson)

391. Graduate Colloquium: Popular Religion in Premodern China

5 units, Win (Neskar)

392. Graduate Colloquium: Postwar Japan—(Same as 292.)

4-5 units (Duus) not given 2000-01

392A. Graduate Colloquium: Japanese Lives—Autobiography and History—(Same as 292A.)

4-5 units (Duus) not given 2000-01

394. Graduate Colloquium: Law and Order in Premodern China—(Same as 294.)

5 units, Spr (Neskar)

395A. Graduate Colloquium: Early and Medieval Japan

4-5 units, Aut (Mass)

395B. Graduate Colloquium: Late Medieval and Early Modern Japan, 1560-1800

4-5 units, Win (Staff)

395C. Graduate Colloquium: Modern Japan

4-5 units, Spr (Duus)
395D. Graduate Colloquium: Modern Chinese Social History—
(Same as 295D.)
5 units, Aut (R. Thompson)

398. Graduate Colloquium: Imperialism, Colonialism, and National Identity in Modern Japan—(Same as 298.)
4-5 units (Duus) not given 2000-01

ADVANCED GRADUATE

Courses numbered 400 to 499 are intended primarily for second- and third-year graduate students, but other qualified students may be admitted by consent of instructor.

400X. Graduate Research
units by arrangement (Staff)

405. Gender, Race, and Colonialism: On the Politics of Knowledge—
(Enroll in Cultural and Social Anthropology 250A.)
5 units, Aut (Stoler)

CLASSICS

401C. Graduate Seminar: Early Greece—Prerequisite: 301C.
4-5 units (J. Morris) not given 2000-01

EASTERN EUROPE AND RUSSIA

419. Graduate Research Seminar: The Soviet Civilization—(Same as 219S.)
4-5 units (Weiner) not given 2000-01

420. Graduate Research Seminar: Russian Historiography
5 units, Win, Spr (Staff)

420B. Graduate Seminar: Modern Russia
8-10 units (Emmons) not given 2000-01

433. Graduate Seminar: Modern Eastern Europe
4-5 units (Naimark) not given 2000-01

MEDIEVAL AND EARLY MODERN EUROPE

411A. Graduate Seminar: Medieval History, Part 1
4-5 units, Win, Spr (Miller)

411B. Graduate Seminar: Medieval History, Part 2
4-5 units, Spr (Buc)

413. Graduate Research Seminar: Early Modern Europe
4-5 units, Spr (Findlen)

MODERN EUROPE

430. Graduate Seminar: The French Revolution
4-5 units (Baker) not given 2000-01

433A, B. Graduate Seminar: European History
8-10 units (Sheehan) not given 2000-01

437. Graduate Seminar: Modern European Cultural and Intellectual History
4-5 units (Robinson) not given 2000-01

437A. Graduate Seminar: Modern European History
5 units, Win, Spr (Robinson)

438. Graduate Seminar: The European Enlightenment
8-10 units (Staff) not given 2000-01

499. Graduate Seminar: European History Workshop—All Europe-
4-5 units (Staff) not given 2000-01

proposals by students and faculty are read and discussed.
1 unit, Spr (Robinson)

HISTORY OF SCIENCE AND TECHNOLOGY

462. Graduate Seminar: Science and High Technology in the Silicon Valley, 1930-1980—(Same as 262S.)
4-5 units, Aut (Lenoir)

463. Graduate Research Seminar in History of Science
4-5 units, Spr (Findlen)

BRITAIN

442A, B. Graduate Seminar: Research, Paleography and Archives of Early Modern England
8-10 units (Seaver) not given 2000-01

445. Graduate Seminar: Modern Britain
4-5 units, Win (Stansky)

AFRICA

446. Graduate Seminar: Popular Culture in Africa—(Same as 246S.)
4-5 units (Jackson) not given 2000-01

447. Graduate Seminar: The Great Mau Mau Rebellion in 1950s Kenya—(Same as 247S.)
4-5 units (Jackson) not given 2000-01

448A. Graduate Seminar: Colonial States and Societies in Africa—
(Same as 248S.)
8-10 units, Win, Spr (R. Roberts)

THE UNITED STATES

451. Graduate Seminar: 20th-Century America
8-10 units (Bernstein) not given 2000-01

454. Graduate Seminar: Culture and Ideology in American History
4-5 units (Fredrickson) not given 2000-01

456A, B. Graduate Seminar: United States in the 20th Century
8-10 units (Kennedy) not given 2000-01

457. Graduate Seminar: The United States
4-5 units (Robinson) not given 2000-01

458, 458A. Graduate Seminar: Environmental History—Where most historians see only culture, environmental historians say nature. Where scholars see nature, environmental historians say culture. The reciprocal connections between human induced environmental change and social change, cultural constructions of nature and their influence on the natural world, and the ways humans naturalize certain cultural traits. Research seminar is designed to produce either dissertation chapters or articles worthy of publication. Weekly exercises assist students in formulating research questions and pursuing research strategies.
5 units, Aut, Win (R. White)

460. Graduate Seminar: America in the World—Ways to place American history in an international context. Comparative, transnational, diplomatic, and world systems are approaches to complete a research paper based on research into primary materials. Historical methodologies, research strategies, and essay projects.
5 units, Win, Spr (Chang)

473A, B. Graduate Seminar: U.S. Women’s Family and Sexual History
8-10 units (Freedman) not given 2000-01

474. Graduate Seminar: Race, Ethnicity, and Class in 20th-Century America
8-10 units (Camarillo) not given 2000-01
LATIN AMERICA

476. Graduate Seminar on Latin America
4-5 units, Aut (Wirth)

478. Graduate Seminar: Economic and Social History of Latin America—Open to non-Latin Americanists working on research projects that utilize quantitative data. Acquaints students with social science approaches to Latin American history.
4-5 units (Haber) not given 2000-01

482. Graduate Seminar: Historical Approaches to Social Science
4-5 units (Haber) not given 2000-01

JEWISH HISTORY

485A. Graduate Research Seminar in Modern Jewish History
4-5 units, Win, Spr (Rodrigue)

MIDDLE EAST

487. Graduate Seminar: Topics in the Modern History of Egypt, Palestine, and Israel—(Same as 287S.)
4-5 units (Beinin) not given 2000-01

EAST ASIA

490. Graduate Seminar: Modern China
4-5 units, Spr (R. Thompson)

493. Graduate Seminar: Late Imperial China
4-5 units (Neskar) not given 2000-01

498, 498A. Graduate Seminar: Japanese Historical Texts—Introduction to the study of medieval documents written in the "kambun" style. Library assignments acquaint students with major reference works.
8-10 units, Win, Spr (Mass)

OVERSEAS STUDIES

These courses are approved for the History major and taught overseas at the campus indicated. Students should discuss with their major advisors which courses would best meet individual needs. Descriptions are in the "Overseas Studies" section of this bulletin or at the Overseas Studies office, 126 Sweet Hall.

BERLIN

105V. Industry, Technology, and Culture, 1780-1945—(Same as Overseas Studies 120V.)
4 units, Win (Neckenig)

227V. The Second World War in Berlin
4-5 units, Aut (Sheehan)

228V. War and Peace in the 20th Century
4-5 units, Aut (Sheehan)

229V. Architecture and the City, 1871-1990: Berlin as a Nucleus of Modernity—(Same as Overseas Studies 143U.)
4 units, Spr (Neckenig)

FLORENCE

106V. Italy: From an Agrarian to a Post-Industrial Society
4 units, Aut (Mammarella)

213V. Power, Art, and Knowledge in Renaissance Italy
5 units, Aut (Findlen)

214V. Science, Technology, and Art: The Worlds of Leonardo
5 units, Aut (Findlen)

215V. The Scientific Revolution: From the Renaissance to the 18th Century
4-5 units, Win (La Vergata)

MOSCOW

121V. Russia in the Age of Nobility, 1700-1840: State, Society, and Culture
5 units, Aut (Zorin)

218V. War and Women in Russia in the 20th Century
4 units, Aut (Jolluck)

220V. Moscow Project: History and Memory of the Cold War
1-3 units, Aut (Naimark)

224V. Stalinism, High Stalinism, and the Cold War in Moscow
5 units, Aut (Naimark)

OXFORD

141V. European Imperialism and the Third World, 1870-1970
5 units, Spr (Darwin)

145V. Britain in the 20th Century
5 units, Spr (Tyack)

204V. Museums, History, and Culture
4 units, Aut (J. Corn, W. Corn)

233V. European Architecture, 1500-1800
5 units, Spr (Tyack)

243V. Victorian Britain: The First Industrial Culture and Its Discontents
units to be announced, Aut (J. Corn, W. Corn)

PROGRAM IN HISTORY AND PHILOSOPHY OF SCIENCE

Chair: Timothy Lenoir
Committee-in-Charge: Barton Bernstein (History), Joe Corn (History), Paul David (Economics), Paula Findlen (History), Peter Godfrey-Smith (Philosophy), Yair Guttmann (Philosophy, Sarah Jain (Cultural and Social Anthropology), Timothy Lenoir (History), Reviel Netz (Philosophy)

Professors: Barton Bernstein, Paula Findlen, David Holloway, Timothy Lenoir, Richard White

Associate Professors: Ahmad Dallel, Peter Godfrey-Smith

Assistant Professors: Yair Guttmann, Sarah Jain, Reviel Netz

Senior Lecturer: Joseph Corn

Visiting Professors: Stephen Hilgartner, Norbert Paul

Affiliated Faculty: John Bender (English), Hans Ulrich Gumbrecht (Comparative Literature), C. Francis Everitt (Hansen Lab), Alex Pang (Science, Technology, and Society), Michael Riordan (SLAC), Charles A. Taylor (Mechanical Engineering, Surgery)

Lecturers: Michael John Gorman, Nick Wilding

Fellow: Sybille Obrecht

Other Affiliation: Henry Lowood (Stanford University Libraries), Michael Riordan (SLAC), Larry Zaroff (Department of Anesthesiology)

The Program in History and Philosophy of Science (HPS) is an interdisciplinary, non-degree program focusing on the historical and contemporary aspects of science, medicine, and technology. The program offers graduate degrees through the departments in which core faculty teach, principally History, Philosophy, Cultural and Social Anthropology, and Classics. Undergraduate degrees are offered through the departments of...
History and Philosophy, and through the Program in Human Biology. The program works cooperatively with other departments and programs in the administration of undergraduate majors and graduate degrees. Its undergraduate and graduate courses span the period from antiquity to the late 20th century, with special emphasis on ancient and Islamic science; Renaissance science; the scientific revolution; history of medicine and the body; history and philosophy of biology; history and philosophy of modern physics; history of computers and information sciences; and gender, science, and technology. These courses are designed both for students looking for a humanistic perspective on the sciences and for students trying to understand the relationship of the sciences to humanistic knowledge.

Stanford has unique resources for the history and philosophy of science. Situated in the heart of Silicon Valley at an institution with a long and distinguished tradition in many sciences, the University is surrounded by archives for the recent history of science and technology. Stanford Universities Libraries has rich holdings in Special Collections for the Scientific Revolution, as well as the modern and contemporary study of science and technology. The University is in close proximity to some of the most interesting public science museums in the country: the California Academy of Sciences, Exploratorium, Computer History Museum, and Tech Museum. Graduate students can take advantage of faculty, classes, and archives at UC Berkeley through Stanford’s exchange program. The core of the community is the colloquium series which brings together faculty and students several times a quarter to discuss the work of invited speakers on topics of broad concerns to science and technology studies.

UNDERGRADUATE DEGREES

Students who wish to pursue the history and philosophy of science and technology should major in the department of History, which offers an interdisciplinary major in History and Science, in the department of Philosophy, which offers a specific degree in History and Philosophy of Science, or in the program in Human Biology, which offers a concentration in history of science and medicine. A concentration in the anthropology of science, or in ancient science can be arranged with the departments of Cultural and Social Anthropology and Classics respectively. Alternately, students may consult with a member of the Committee-in-Charge to construct an individually designed major. The major must conform to the requirements for Individually Designed Majors (see the “Individually Designed Majors” section of the bulletin).

GRADUATE DEGREES

Students can pursue either a A.M. or a Ph.D. in history and philosophy of science through departments in which appropriate faculty members teach. Students interested in pursuing a graduate degree should consult with the appropriate faculty members in order to determine which departmental degree best meets their needs. Applications for admission should be sent to the appropriate department.

COURSES

INTRODUCTORY

60. Introduction to the History and Philosophy of Science—(Same as Philosophy 60.) Survey of 20th-century views on the nature of scientific knowledge. Logical positivism and Popper; the problem of induction; Kuhn, Feyerbend and radical philosophies of science; subsequent attempts to rebuild moderate empiricist and realist positions; case study in the history of biology. GER:3a (DR:8)

3 units, Spr (Godfrey-Smith)

SCIENCE IN HISTORY

This sequence is designed to introduce students to fundamental aspects of the history of science from antiquity to the 20th century. Students concentrating in the history of science are advised to take most or all of this sequence as a core foundation.

100. Invention of Science—(Enroll in Classics 133.)

3-4 units, Aut (Netz)

101. Undergraduate Colloquium: Science in the Islamic World—(Enroll in History 290.)

5 units, Aut (Dallal)

102. Undergraduate/Graduate Colloquium: The Scientific Revolution—(Enroll in History 206P;306P; graduate students register for 306P.)

5 units, Win (Gorman)

103. The Darwinian Revolution—(Enroll in History 133.)

4 units (Lenoir) not given 2000-01

104. History of 20th-Century Physics—Describes, analyzes, and interprets the major scientific changes characteristic of the 20th century. Introduction to the ideas of relativity, the influence of quantum theory, and alternating scientific fashions from atomic, nuclear, and particle physics, including the impact on cosmology, semiconductors, and superconductivity. Emphasis is on corresponding cultural changes in areas such as sociology and philosophy, and on the changing role of physics in the 20th century.

3-5 units, Win (Riordan)

MEDICINE IN HISTORY

This sequence is designed to introduce students to fundamental aspects of the history of medicine from antiquity to the 20th century. Students concentrating in the history of medicine are advised to take most or all of this sequence as a core foundation.

120. Medicine in Ancient Greece and Rome—(Enroll in Classics 139.)

4 units, given 2001-02

121. The Emergence of Modern Medicine—(Enroll in History 13.)

5 units, Spr (Findlen)

122. The Rise of Scientific Medicine—(Enroll in History 33A.)

5 units (Lenoir) not given 2000-01

PHILOSOPHICAL PERSPECTIVES ON SCIENCE, MEDICINE, AND TECHNOLOGY

This sequence is designed to introduce students to fundamental aspects of the philosophy of science. Students concentrating in the philosophy of science are advised to take HPS 60 as a starting point, and combine a number of the electives listed below, in conjunction with courses in the other concentrations that address their specific interests.

140. Popper, Kuhn, and Lakatos—(Enroll in Philosophy 156.)

3 units, Spr (Phillips)

141. Philosophy of Statistics—(Enroll in Philosophy 163.)

4 units, not given 2000-01

142. Central Topics in the Philosophy of Science: Theory and Evidence—(Enroll in Philosophy 164/264.)

4 units, Aut (Strevens)

143. Philosophy of Physics—(Enroll in Philosophy 165/265.)

4 units, Win (Strevens)

144. Philosophy of Biology—(Enroll in Philosophy 167A/267A.)

4 units (Godfrey-Smith) not given 2000-01

145. Philosophy, Biology, and Behavior—(Enroll in Philosophy 167B/267B.)

4 units (Godfrey-Smith) not given 2000-01
146. Plato's Philosophy: Eros, Mathematics, and Reality—A Reading of Plato—(Enroll in Philosophy 116/216.)  
4 units, Win (Moravcsik, Netz)

ADVANCED

HISTORICAL PERSPECTIVES ON SCIENCE

The following classes focus on specific episodes in or approaches to the history of science.

151. Stanford Introductory Seminar: Technologies of Civilizations, Writing, Number, Money—(Enroll in Classics 22N.)  
3-4 units, Aut (Netz)

152. Undergraduate/Graduate Colloquium: New Worlds, Imaginary Worlds—(Enroll in History 213A/313A.)  
5 units (Findlen) not given 2000-01

3-5 units, Aut (Findlen, Gorman)

154/254. Undergraduate/Graduate Colloquium: When Worlds Collide—The Trial of Galileo—(Enroll in History 216/316.)  
5 units, Win (Findlen)

155. The Prehistory of the Computer—(Enroll in Science, Technology, and Society 126.)  
3-5 units, Spr (Gorman)

156. Bodies and Machines: From Descartes to Frankenstein—(Enroll in Science, Technology, and Society 131.)  
3-5 units, Aut (Wilding)

5 units, Spr (Wilding)

158. Information Revolutions: Technology and Forms of Knowledge—(Enroll in Science, Technology, and Society 140.)  
3 units, Aut (Pang)

CONTEMPORARY PERSPECTIVES ON SCIENCE, MEDICINE, AND TECHNOLOGY

The following classes focus on contemporary cultural and social science approaches to science, technology, and medicine.

5 units, Aut (Lenoir)

161. Undergraduate/Graduate Colloquium: Body Works—Medicine, Technology, and the Body in Late 20th-Century America—(Enroll in History 274A/374A.)  
4-5 units, Win (Bender, Lenoir, Taylor)

162. Stanford Introductory Seminar: Virtuality  
5 units (Lenoir) not given 2000-01

4 units, Win (Lowood)

164. Technology, Science, and Gender—(Enroll in Cultural and Social Anthropology 132.)  
5 units, Win (Jain)

165. Anthropology of Disasters—(Enroll in Cultural and Social Anthropology 283.)  
5 units, Spr (Jain)

168. Trials of the 20th Century: Technology, Law and Culture—(Enroll in Cultural and Social Anthropology 85.)  
5 units, Aut (Jain)

199. Directed Reading  
1-5 units (Staff)

299. Graduate Individual Work  
1-5 units (Staff)

AFFILIATED DEPARTMENT OFFERINGS

FRENCH AND ITALIAN

185E. The Dawn of a New Vision: The Evolution of Scientific and Philosophical Though from the Late Middle Ages to the Western Renaissance (1000-1500)  
3 units, Aut (Fusco)

INTERDISCIPLINARY STUDIES IN HUMANITIES

198Z. Core Seminar: The Prose and Poetry of Medical History  
5 units, Spr (Zaroff)

PHILOSOPHY

242. Philosophy of Science Seminar  
3 units, not given 2000-01

SCIENCE, TECHNOLOGY, AND SOCIETY

200. Senior Colloquium  
2 or 4 units, Win (Pang)

PROGRAM IN HUMAN BIOLOGY

Emeriti: (Professors) Paul Bascom (Education), Sanford Dornbusch (Sociology), Albert H. Hastorf (Psychology), Luigi Cavalli-Sforza (Genetics)  
Director: Russell D. Fernald  
Assistant Director: Shirley Feldman  
Professors: J. Myron Atkin (Education), Clifford Barnett (Anthropological Sciences), William Dement (Psychiatry), Carl Djerassi (Chemistry), William H. Durham (Anthropological Sciences, Human Biology), Marcus Feldman (Biological Sciences), Russell D. Fernald (Psychology, Human Biology), H. Craig Heller (Biological Sciences), Herant Katchadourian (Human Biology), Donald Kennedy (Biological Sciences), Richard Klein (Anthropological Sciences), Timothy Lenoir (History), Michael Marmor (Ophthalmology), Robert Sapolsky (Biological Sciences), Arthur B. Wolf (Anthropological Sciences)  
Associate Professors: John E. Atwood (Medicine), Christos Constanti- 
nou (Urology), Anne Fernald (Psychology), James Fox (Anthropological Sciences), Peter Godfrey-Smith (Philosophy), Ramachandra Guha (Anthropological Sciences), Margo Horn (History), Gordon Matheson (Medicine), Daria Mochly-Rosen (Molecular Pharmacology, Human Biology), Ellen Porzig (Developmental Biology, Human Biology, Molecular Pharmacology), Robert Reich (Political Science), John Rick (Anthropological Sciences), Robert Siegel (Microbiology and Immunology)  
Assistant Professors: Amato J. Giaccia (Radiation Oncology), Joanna Mountain (Anthropological Sciences)  
Associate Professor (Teaching): Carol Boggs  
Other Teaching Faculty: William Abrams, Donald Barr, Baruch Blumberg, Malcolm Cohen, Shirley Feldman, Anne Friedlander, Hill Gates, Michael Green, William B. Hurlbut, Alan Launer, Philip Lee, Anne Maggioncalda, Armin Rosencranz, Merritt Ruhlen, Ewen Wang  
Student Advisers: Rita Chitkara, Sylvia Lin, Melisa Neuwelt, Nkem Ogbechie, Ganesh Shankar, John Turnbull

The Program in Human Biology is an interschool, interdepartmental, undergraduate major. It provides an interdisciplinary perspective on
the relationship between the biological and social aspects of humanity’s origin, development, and prospects.

The program has three goals:
1. To provide a broad and rigorous introduction to the biological and behavioral sciences and their interrelationships.
2. To relate these sciences to the problems raised by the relationships of human beings to one another and to their environment.
3. To help each student achieve a high level of understanding by focusing on one aspect of the biological and behavioral sciences, and its application.

The Human Biology curriculum draws on faculty from diverse University departments and schools. To complete the requirements for the major, students must take courses from the offerings of the program and from the listings of other University departments. The program culminates in an A.B. in Human Biology.

Human Biology majors are well prepared for advanced training in professional schools (for example, education, law, medicine, public policy) and graduate programs in the behavioral, natural, and social sciences, depending on their choice of upper-division courses. Undergraduates in Human Biology often enter coterminous master’s degree programs in a number of other University departments.

Additional information about the major may be obtained from the program’s offices or the web site at www.stanford.edu/dept/humbio.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The A.B. in Human Biology (HB) requires a minimum of 87 units in the major divided between four levels of courses:

1. **Fundamental Program:** at least 38 units, to include
   - Human Biology Core (30 units)
   - Statistics (4-5 units)
   - Internship (HB 197; 4 units)
   The Human Biology Core refers to HB 2A and 2B, 3A and 3B, and 4A and 4B. See “Required Courses” below for more information.

2. **Foundation Courses:** 20-unit minimum. Total units vary, depending on the focus of study selected by the student for the area of concentration. They may include practicums, labs, and introductory-level courses from across the University. A maximum of 10 premed units (from the chemistry, physics, and calculus series, and biology lab courses) and 4 research units are allowed.

3. **Area of Concentration:** a minimum of five courses totaling at least 20 units. This in-depth area of study enables the student to focus on educational and post-baccalaureate goals. Courses must be numbered 100 or above. Three or more departments must be represented in the concentration. Each course must be taken for a minimum of 3 units. Final approval of the concentration rests with the student advisers and the honors program. All area of concentration courses must be taken for a grade. Examples of numerous possible areas of concentration are available in the Human Biology Student Handbook.

4. **Upper-Division Courses:** students must take three Human Biology upper-division courses numbered 100 to 189. Students are expected to enroll in courses outside the area of concentration for breadth. Lab courses cannot be used to fulfill the upper-division requirement. One upper-division course may be taken satisfactory/no credit. Each course must be taken for a minimum of 3 units. All non-laboratory advanced courses (those numbered 100 to 189) fulfill the Human Biology upper-division requirement, including those that say "enroll in" another department.

A prospective major must consult with the student advisers to obtain detailed information about the program and guidance in the development of an individual course of study. At the time the major is declared, the student must submit a brief written statement of academic and long-term goals and a proposed roster of courses satisfying the requirements for the major. The proposal is reviewed by the student advisers who then help identify an appropriate faculty adviser. Final approval of the proposed course of study rests with the faculty adviser.

There are three upper-division tracks offered within the program: Health Policy, Human Health and Performance, and Environmental Policy. Students with interests in these programs should contact the appropriate coordinator.

Students who plan to pursue graduate work should be aware of the admission requirements of the schools to which they intend to apply. Early planning is advisable to guarantee completion of major and graduate school requirements.

MINORS

A minor in Human Biology provides an introductory background to the relationship between the biological and social aspects of humanity’s origin, development, and prospects. Many of the major problems facing human civilization today involve both biological and social aspects. Scientific approaches to these problems are essential, but they must be broadly conceived, integrating what we know of the biological with an understanding of the social and cultural setting in which they exist. Students with a minor in Human Biology will have a strong background in the integration between the biological and social aspects of humans.

To minor in Human Biology, students must take the core curriculum (Human Biology 2A, 2B, 3A, 3B, 4A, and 4B) and one additional upper-division course (for example, any course offering by Human Biology with a number over 100, including courses cross-listed with other departments or programs). These must be taken for a letter grade of “C+” or better. Courses that count towards the fulfillment of major requirements may not be counted towards the minor.

Students declaring a minor in Human Biology must do so no later than two quarters prior to their intended quarter of degree conferral (for example, a student must declare a minor before the end of the Autumn Quarter to graduate the following Spring Quarter).

HONORS PROGRAM

The honors program in Human Biology affords qualified majors the opportunity to work closely with faculty on an individual research project, culminating in an honors thesis. Students may begin honors research from a number of starting points including: topics introduced in the core or upper-division courses; independent interests stemming from an internship experience; or collaborating with faculty from the natural, social, or behavioral sciences. Students may apply to the honors program once they have completed the Human Biology core, have an overall Stanford grade point average (GPA) of 3.0, and meet other requirements detailed in the honors handbook. Interested students should consult resources in the Human Biology office including the Human Biology Honors Handbook, the honors program application available from the student services office, and appointments during office hours with the Human Biology honors chair.

Specific courses of interest to honors students include: 160A (Senior Honors Colloquium in Health Policy and Social Issues), 190 (Honors Seminar for Sophomores), 191 (Honors Seminar for Juniors), 192 (Research in Human Biology), and 194 (Honors). Most honors projects involve a total of 10 to 15 units of course work in HB 193 and 194.

Admission to the honors program is by application, normally between mid-May of the junior year and mid-October of the senior year. Students planning to conduct honors research are encouraged to attend the Honors Seminar for Juniors (191) and to begin research or preparation during their junior year. An Honors College is held for a select number of senior honor students just prior to Autumn Quarter each year. For applications, contact the program office. The honors thesis is normally completed by the middle of Spring Quarter of the senior year. Each honors
student then presents a brief summary of honors research at the Human Biology Honors Symposium in May.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

The faculty and staff of Human Biology prepare a student handbook, available on the web, at www.stanford.edu/dept/humbio/, which provides a detailed description of the Human Biology major and outlines possible areas of concentration. It reflects the most up-to-date information for the academic year, and is the definitive guide for all Human Biology majors.

REQUIRED CORE

Required Core sequences (2A and 2B, 3A and 3B, and 4A and 4B) introduce the biological and social sciences, and most importantly, relationships between the two. Classes meet throughout the academic year. Students must register concurrently for the A and B series and take the core in sequence. Students should initiate the core in Autumn Quarter of the sophomore year. A deviation from the core sequence must first be approved by the program chair through a petition process. Freshmen are not permitted to enroll. Majors must take core courses for a letter grade.

2A,B. Genetics, Evolution, and Ecology: Culture, Evolution, and Society

2A. Genetics, Evolution, and Ecology—Introduction to the basic principles of classical and modern genetics, evolutionary theory, and population biology. Topics: micro- and macro-evolution, population and molecular genetics, population dynamics, and community ecology, emphasizing the genetics of the evolutionary process and applications to human populations. GER:2a (DR:5)

5 units, Aut (Boggs)

2B. Culture, Evolution, and Society—Introduction to the evolutionary study of human diversity. Hominin evolution, the origins of social complexity, social theory, and the emergence of the modern world system, emphasizing the concept of culture and its influence on human differences. GER:3b (DR:9)

5 units, Aut (Klein)

3A,B. Cell Biology and Developmental Biology: Biology and Culture in Human Development

3A. Cell and Developmental Biology—The basic principles of the biology of cells: the principles of human developmental biology, the biochemistry of energetics and metabolism, the nature of membranes and organelles, hormone action and signal transduction in normal and diseased states (diabetes, cancer, autoimmune diseases), drug discovery, immunology, and drug addiction. GER:2a (DR:5)

5 units, Win (Mochly-Rosen)

3B. Biology and Culture in Human Development—Introduction to the research and theory on early human development. How psychological factors shape the developing child, and how cultural practices shape the environments of childhood and influence human cognitions, emotions, moral judgments, relationships, and social behavior from birth through adolescence. GER:3b (DR:9)

5 units, Win (A. Fernald)

4A,B. The Human Organism: The Human Predicament

4A. The Human Organism—Organ system physiology, beginning with the basic principles of neurobiology and endocrinology, and the functions of body organs. The mechanisms of control, regulation, and integration of organ systems function. GER:2a (DR:5)

5 units, Spr (R. Fernald, Heller)

4B. The Human Predicament—The relation of the biological sciences to public policy in resource management and conservation practices, the regulation of environmental and health risks, agricultural production, the delivery of health services, the protection of biodiversity, and global climate change. Assigned policy challenges in lectures and section meetings. Reading on actual cases. GER:3b (DR:9) (WIM)

5 units, Spr (Boggs, Goulder)

ADDITIONAL INTRODUCTORY OFFERINGS

2S,3S,4S. Bioethical Issues in Human Biology—Year long introductory series on the social, ethical, philosophical and religious issues associated with advances in biomedical science. Guest speakers with discussion format. Designed to parallel the Human Biology core sequence, but may be taken independently of the core. Each of series is different and may be taken in any sequence or as single courses. 1 unit S/NC, 2 units with weekly discussion section. See http://www.stanford.edu/class/bioethics.

2S. Bioethics—Topics: ethics and human origins, the Human Genome project, genetic screening and eugenics, genetic engineering, beauty and disgust as agents of evolution, religion in the age of Darwinism, and evolution and the future of humanity.

1-2 units, Win (Hurlbut)

3S. Bioethics—Topics: in vitro fertilization, intraterine surgery, growth hormone, cosmetic surgery, the nature of desire and sexuality, anorexia nervosa, cloning and human stem cells, natural aging and extending the lifespan.

1-2 units, Win (Hurlbut)

4S. Bioethics—Topics: terraforming Mars, psychophysiology of space travel, computer mediated surgery, virtual reality, ecology and human disease, global warming, and biowarfare.

1-2 units, Spr (Hurlbut)

3Y. Practicum in Child Development—Practicum experience at Bing Nursery School for 3.5 hours/week. Must be taken concurrently or subsequent to 3B. (AU)

1 unit, Win (A. Fernald, Hartman)

6. Human Origins—(Enroll in Anthropological Sciences 6.)

5 units, Win (Klein)


4 units, Spr (Katchadourian)

11. Sleep and Dreams—Multimedia lecture/survey format provides a background of current information and research on how sleep affects our daily lives. Topics: the physiology of non-REM and REM sleep, dreams and dreaming, content, psychophysiological cause, lucid dreaming; sleep need, sleep debt, daytime alertness and performance; biological clock and circadian rhythms; sleep disorders, insomnia, narcolepsy, sleep apnea, sleepwalking, jet lag, sleeping pills, sleep and mental illness, sleep and memory, sleep and the impact of sleep deprivation and sleep disorders on students' academic performance and social life.

3 units, Win (Dement)

12. The Nature of Health—The concept of health from a sociologic perspective. Ways to define and measure health, and how social factors (education, standard of living, race, and ethnicity) can affect the health of an individual, a community, or a nation. Personal behavior as a determinant of health within this context. Lectures, student presentations, and discussions.

3 units, Spr (Barr)

13. The Emergence of Modern Medicine—(Enroll in History 13.)

5 units, Spr (Findlen)
16. Introduction to Anthropological Genetics—(Enroll in Anthropological Sciences 8.)
   5 units, Win (Mountain)

20. Understanding the Drug Development Process—Dialogue with representatives from academia and leading pharmaceutical and biotech companies. From ideas to medical therapies (conception, clinical trials, and marketing of new pharmaceuticals). Topics: academic vs. industrial research, clinical trials, FDA approval process, role of biotechnology in the drug development process, marketing, and business development of new drugs. (AU)
   1 unit, Spr (Staff)

32. Academic and Career Choice—Overview of the questions and issues regarding academic and career choice and consequences. General theories. How Stanford graduates make choices based on factors such as gender; ethnicity; social class; relationships with parents, faculty, and peers. The outcome of these choices with respect to career patterns and measures of career success and satisfaction (compensation, commitment, and competence). The relationship of careers to personal life with respect to marriage, parenthood, and intellectual and social interests.
   2 units, Spr (Katchadourian)

60. Colloquium on Population Studies—(Enroll in Biological Sciences 146.)
   1 unit, Win (M. Feldman)

61. Introduction to the History and Philosophy of Science—(Enroll in Philosophy 60.)
   5 units, Spr (Godfrey-Smith)

STANFORD INTRODUCTORY SEMINARS

90Q. Stanford Introductory Seminar: Contemporary Issues in Human Experimentation—Preference to sophomores. Issues in using humans for experimentation in medical research. The principles of protection of subjects, the process of obtaining informed consent, organization of protocols, evaluation of experimental design, and scientific merit. Ethical/legal issues involving human subjects in terms of confidentiality, recruitment, and conflict of interest. Legislation addressing inadequate numbers of women and minorities in research projects. Focus is on research with the cognitively impaired, prisoners, and barriers to obtaining informed consent in issues of age, language, and factors that may affect the ability to give truly informed consent.
   3 units, Win (Constantinou)

91Q. Stanford Introductory Seminar: Studies of Animal Behavior—Preference to sophomores. Animal behavior offers insights about evolutionary adaptations. The origins of the study of animal behavior and its development to the present. Discussion of original research papers. The use and misuse of parallels between animal and human behavior. Possible field trip to observe animals in their natural habitat.
   3 units, Aut (R. Fernald)

94Q. Stanford Introductory Seminar: The Nation's Health—Preference to sophomores. A broad overview of the nation's health. Topics: trends in healthy populations; determinants of health; health policy; values, ethics, and ideology; politics of health; public health and clinical preventive services; medicine and public health collaboration; the health care system; Medicare and Medicaid; medical markets and managed care; and quality of care. Weekly presentations by students. Enrollment limited to 15.
   3 units, Aut (Lee)

95Q. Stanford Introductory Dialogue: Science-in-Fiction is not Science Fiction—(Enroll in Chemistry 25Q.)
   2 units, Win (Djerassi)

97Q. Stanford Introductory Seminar: Sport, Exercise, and Medicine—Exploring the Relationships—Preference to sophomores. Sports medicine is comparatively new. Some aspects of the discipline, e.g., sports traumatology, are similar to “disease-based” medicine. Sports medicine's main contribution is to assist in the creation of a “health-based” model of medicine, under the premise that physical activity and exercise are the principal determinants of health. The issues that connect sport, exercise, health, and medicine, providing critical insights into the strengths and tensions that affect these relationships. Case examples and lab study sports injuries, human performance, ethics, winning, coaching, the team physician, nutritional supplements and drugs in sport, exercise and aging, women’s issues, and exercise and health.
   3 units, Aut (Matheson)

ADVANCED

Open to non-majors with the proper prerequisites. Human Biology majors have preference when enrollment is restricted. All classes listed here fulfill the Human Biology upper-division requirement, including those that say “enroll in” another department.

101. The Human Hand: Evolution, Ontogeny, and Influence—The structure and function of the human hand from evolutionary, developmental, and cultural perspectives. Topics: the evolution of the five digit limb pattern, homology and analogy in vertebrate limb patterns, variation in limb patterns, variation in human patterns and their proposed developmental mechanisms; models of hand use; the evolution of true opposability; the archaeology of tool manufacture and implementation; cultural perspectives on the significance of the hand in gesture, sign language, mathematics (base ten), music, writing, symbolism, instrumentation, and art. Enrollment limited to 15. Prerequisites: Human Biology core or consent of instructor.
   3 units (Porzig) not given 2000-01

102A. Children, Youth, and the Law—Analysis of the legal “rights” of children and adolescents in America and how those rights are defined, protected, and enforced through the legal process within the context of the developmental needs of children and youth and competing societal interests. Topics: the origins and definitions of children’s rights; adoption; custody; the juvenile justice system (abused, neglected, and dependent children, status offenders such as runaways and truants and minors accused of crimes); education; informed consent; health care; protection from harm and child welfare; due process; and privacy, freedom of expression, and exercise of First Amendment rights. Interactive, using hypotheticals for discussion and analysis. Companion to 102B, and alternates every other year; students may take one, or both.
   4 units, Win (Abrams)

103. Women, Fertility, and Work: The Biology/Culture Debate about Gender—Seminar on women's efforts to bear and rear young children while contributing to familial and community production. How women and men share and balance these aspects of social reproduction in diverse societies. Theoretical approaches to the connection between biology and culture are tested, emphasizing interactional effects. The limits of theories of the cultural construction of femaleness, connections between gender and political economy, and how these culture's differently envision individual and collective responsibilities in women's work and childcare.
   3 units (Gates) not given 2000-01

104. Aging: From Biology to Social Policy—(Enroll in Anthropological Sciences 171.)
   5 units, Spr (Barnett)

105. Bioethics and Anthropology—(Enroll in Anthropological Sciences 174.)
   5 units, Spr (Koenig)

107. Astrobiology and Space Exploration—Evolution is cast against space and time, focusing on the emergence of life, intelligence, and civilization on Earth and, possibly, elsewhere. The phenomenon of human space exploration and the biological, psychological, sociological,
and ultimately, philosophical issues that emerge. Integrates information from astrophysics, biochemistry, chemistry, evolutionary biology, geology, paleontology, physiology, psychology, and sociology. Taught by scientists from NASA Ames Research Center. Enrollment limited to 30. Prerequisites: one year college-level mathematics, physics, chemistry, biology, or psychology.

3 units, Spr (Siegel)

108. Advanced Seminar on Bilingualism and Second Language Acquisition—Theoretical issues and research pertaining to bilingual acquisition of the two languages and second-language acquisition for children and adults. Urgent practical issues relating to the growing number of children in the U.S. educated in their second language. Emphasis is on childhood bilingualism and on socio-cultural factors relating to language acquisition. The controversies surrounding bilingualism and second language acquisition. Informed opinions concerning the current debate on bilingual education in the U.S.

3 units (Wakabayashi) not given 2000-01

109. Human Behavioral Biology—(Enroll in Biological Sciences 150/250.)

6 units (Sapolsky) alternate years, given 2001-02

110. Vertebrate Biology—The evolution, form, function, and behavior of the vertebrates, from primitive fishes to birds and mammals, including humans. Prerequisite: Biological Sciences or Human Biology core.

3-4 units, Spr (Porzig)

110L. Vertebrate Biology Lab—Comparative anatomy structure of the vertebrates, emphasis on osteology. Representatives of each of the seven vertebrate classes are available in lab. Review labs and field trips. Prerequisites: current or previous enrollment in 110.

3 units, Spr (Porzig)

111. Human Physiology—(Enroll in Biological Sciences 112/212.)

4 units (Heller, Harris) alternate years, given 2001-02

112. Hormones and Behavior—(Enroll in Anthropological Sciences 132.)

5 units (Maggiooncalda) not given 2000-01

113. The Biology and Evolution of Language—(Enroll in Anthropological Sciences 5.)

4-5 units (Fox) not given 2000-01

115A. Humans and Viruses—(Same as Microbiology and Immunology 115A.) Overview of human virology. Topics illustrate concepts in biology and the social sciences, focusing on emerging infections, viral classification, transmission and prevention, vaccination and treatment, eradication of disease, viral pathogenesis, mechanisms of virally-induced cancer, and viral evolution. Topics: molecular biology of genetic shift and drift in influenza virus, cellular tropism of HIV, developmental biology of virally-induced birth defects, clinical aspects of infantile diarrhea, social aspects of the common cold, policy issues of blood antibody tests, factors in pathogenesis and transmission of prions. Prerequisites: Human Biology core or consent of instructor.

4 or 6 units (Siegel) given 2001-02

115B. Seminar: The Vaccine Revolution—(Same as Microbiology and Immunology 115B.) Advanced seminar. The human aspects of viral disease, focusing on recent discoveries, especially in the area of vaccine development and emerging infections. Journal club format: students select articles from primary scientific literature, write formal summaries, and synthesize it into a literature review on a specific topic. Emphasis is on the development of critical reading, analysis, experimental design, and interpretation of data. Students give four oral presentations and lead discussions based on their scientific journal reading. Enrollment limited to 10. Prerequisite: 115A.

5 units, Spr (Siegel)

116. Eye and Implications of Vision—The basic physiology of vision and how visual capabilities influence human endeavors. Topics: mechanisms of vision, vision in animals, illusions, visual physiology of art, the eye in history and literature, vision in sports. Lectures/seminar format with student participation, oral presentations, and a written thesis. Prerequisite: interest in mechanisms of vision and the humanities.

3 units, Win (Marmor)

117. Policy and Research in Science Education—Controversial topics in science education (e.g., the teaching of evolution, national standards and tests, gender bias, text selection, recruiting and retaining qualified teachers, the goals of science teaching for different populations). The substance and style of formulating policy for science education in the U.S., now and in the recent past. Issues for local, state, and federal authorities; appropriate government roles in the selection of content, improvement of teaching; and research. Primary, secondary, and undergraduate programs; and the use of museums and media in programs to improve science education. International comparisons where appropriate. Enrollment limited to 20.

4 units, Spr (Akin)

118. Human Diversity: A Linguistic Perspective—The diversity and distribution of human language and its implications for the origin and evolution of the human species. The origin of existing languages and the people who speak them. Where did the languages that we currently see in the world come from and how can this diversity be used to study human prehistory? Evidence from related fields (archaeology and human genetics). Topics: the origin of the Indo-European languages, the peopling of the Americas, and the evidence that all human languages share a common origin. GER 4a (DR:2)

3 units, Spr (Ruhlen)

119. Conservation Biology—Introduction to the science of preserving biological diversity, its principles, policy, and application. Topics: the biology of small populations, extinction, minimum viable population analysis, habitat fragmentation, reserve design and management, the Endangered Species Act, and conflict mediation. Case studies and local field trips illustrate topics. 4 units for students who take the recommended field trips. Prerequisite: 2A, Biological Sciences 33 or 51, or consent of instructor.

3-4 units, Win (Boggs, Launer)

120. Human Nutrition—Nutrient flow and interactions within the human body. Emphasis is on the pathways by which nutrients are processed, stored, remodeled, and oxidized to provide energy and functional components. How diet and physical activity affect human health and disease at the physical/biochemical levels. Do athletes have greater nutritional needs? Is fat a toxic substance or an essential nutrient? Do high insulin levels cause obesity? What happens if you don’t meet the recommended dietary allowances? Is leptin the anti-obesity “drug”? What are humans designed to eat? Prerequisite: Human Biology core or consent of instructor.

4 units (Staff)

121. Ethical Issues in the Neurosciences—Multidisciplinary approach to the ethical questions raised by recent advances in the neurosciences. How these advances relate to medical therapy, social policy, and broader considerations of human nature (consciousness, free will, personal identity, and moral responsibility). Discussion format with leading research scientists, legal experts, philosophers, and theologians. Topics: neurogenetics, fetal brain tissue therapy, medicalization of criminal behavior, cosmetic psychopharmacology, and the neurobiological basis of love, sexuality, and gender. Enrollment limited to 15. Prerequisites: Human Biology core, Biological Sciences core, or consent of the instructor.

4-5 units, Spr (Hurlbut)
122. International Health Policy: Comparative National Health Care Systems—(Enroll in International Relations 129.)
3 units, Win (Lee)

123. Sexuality in Adolescence—Current research on the sexual development of young people from a developmental perspective. Critical issues related to the scientific, historical, and cultural perceptions about adolescent sexuality; social influences on sexual development; sexual risk; and the limitations and future directions of research on adolescent sexuality. Sexual identity and behavior, sexually transmitted diseases including HIV, pregnancy, abortion, gay and lesbian youth, sex education and condom availability in schools, the impact of the mass media, sexual activity that is exploitive, and the difficulties and limitations in studying adolescent sexuality. Legal and policy issues, gender differences, and international and historical trends. Texts analyze sexual issues and choices confronting adolescents; current research. Research project, including original data collection about some aspect of adolescent sexuality. GER:4c (DR:f)
3 units, Spr (Brown)

124. Neural Basis of Sleep and Circadian Rhythms—(Enroll in Biological Sciences 249.)
4 units, Aut (Heller, Edgar) alternate years, not given 2001-02

125. Environmental Policy and Law—The role of government and citizens in formulating, implementing, and enforcing environmental policy. Using case studies, background readings, law cases, and statutes, seminar investigates the formal and informal political mechanisms involved in controlling pollution and protecting the environment. Topics: the respective roles of courts, legislatures, executive agencies, and nongovernmental organizations in shaping U.S. environmental policy. The pros and cons of regulatory and economic approaches to pollution control; environmental politics and ethics; air and water pollution; environmental justice; toxic substances and risk assessment; economics and trade; hazardous wastes.
5 units, Spr (Rosencranz)

126. Adolescent Development—Adolescence from sociological, psychological, and psychiatric perspectives. Topics: physical, physiological, and cognitive development; identity; peer group; parent/child relations; impact of school; vocational development; and problem outcomes (eating disorders, violence, and teen pregnancy). Prerequisite: 3B or Psychology 1, or consent of instructor.
4 units, Win (S. Feldman)

127. Research Seminar on Adolescence—For juniors preparing to undertake honors research in their senior year. Small groups jointly design, conduct, analyze, and write up original research. Teaches research-related skills including how to design a survey, enter data on a computer, and data analysis. Enrollment limited to 12. Prerequisite: 3 or corequisite: Psychology 10 or equivalent, or consent of instructor.
4 units, Aut (S. Feldman)

128. The Human Gamete and Pre-Embryo—Writing-based seminar. The cultural, biological, medical, and social aspects of human gametogenesis and the earliest stages of human development. Topics: assisted reproductive technologies (including in vitro fertilization), historical and cultural perspectives on male and female gametes, pre-implantation genetic testing, and the critical analysis of current biological and medical research on gametogenesis. Enrollment limited to 12. Prerequisites: Human Biology core or consent of instructor.
3 units (Porzig) not given 2000-01

130. Adam 2000: Images of Human Life in the Age of Biomedical Technology—Interdisciplinary approach to the social, moral, and aesthetic values which guide the use of biomedical technology. How advances in biology are reshaping our relationship with nature, attitudes toward the body, and ideas about the meaning and purpose of human life. Topics: the use of medical technology to alter appearance and enhance performance, fetal tissue transplantation, biotherapy for criminal behavior, treatment of aging as a disease, and alteration of the body for space travel. Lecture/discussion format with guests from the scientific and religious communities. Limited enrollment. Prerequisites: Human Biology or Biological Sciences core, or consent of the instructor.
4 units, Win (Hurlbut)

131. Natural Resources Policy and Law—Focus is on federal public land and natural resources policy; mining, timber, and grazing law and policy; the legal aspects of forest, range, park, wilderness, wetlands, and wildlife management; recreation and preservation; and related issues. The role of the courts, administrative discretion, the Endangered Species Act, and the tension between protecting resources and respecting property rights. Students research one aspect of law and policy governing the management of natural resources.
5 units, Win (Rosencranz)

132. Seminar on Problem Behavior in Adolescence—Lecture/seminar. Aspects of adolescent problem behavior, including risk; and protective factors, treatments, and intervention programs designed to ameliorate or prevent these problems. Externalizing behaviors (violence, delinquency, drug abuse, risk taking), internalizing problems (depression, eating disorders, suicide), and sexuality-related problems (teen pregnancy, date violence, STDs/HIV). Enrollment limited to 20. Prerequisite: 126 or consent of instructor.
3 units, Spr (S. Feldman)

134. Ecological Anthropology—(Same as Anthropological Sciences 164.) The relationships between human social systems and their environments. How do environments influence the nature and form of human social systems found within them? How do human social systems influence the properties and dynamics of their environments? How can we best conceptualize and understand human social systems, the environment, and the links between them? Case studies of human societies in the Arctic, Amazon, E. Africa, the Alps, and Papua New Guinea. (HEF III)
5 units (Durham) not given 2000-01

135. Global Environmental Policy and Law—(Enroll in International Relations 134.)
5 units, Aut (Rosencranz)

136. Conservation and Development Issues in the Amazon—(Same as Anthropological Sciences 161A.) The prospects for achieving the dual goals of biodiversity conservation and community development in Amazonia. Case studies of recent efforts at biodiversity conservation, including national parks, biosphere reserves, pharmaceutical prospecting, ecotourism, extractive reserves, and agroforestry projects. The costs and benefits of conservation. To whom do these costs and benefits accrue? Critically evaluates Integrated Conservation-Development Projects (ICDPs) in the Amazon today. Optional field trip over Spring Break (at added expense, limited capacity) to selected ICDPs in the Peruvian Amazon. (HEF II)
5 units, Win (Stroenza, Durham)

139. Primate Societies—(Enroll in Anthropological Sciences 131B.)
5 units, Win (Maggioncalda)

141. Race, Poverty, and the Environment—Seminar on environmental conditions and disproportionate environmental impacts in poor and minority communities in the U.S., correlating race, ethnicity, and income to exposure to environmental and public health hazards. Case studies on migrant workers and Native American subsistence fishers.
5 units (Rosencranz) not given 2000-01

142A. The Impact of AIDS—Focus is on HIV, particularly disease pathology and the spread of the virus, providing a foundation for understanding the impact of HIV on biology, medicine, and society.
Biology, clinical features, cultural aspects, and intervention/prevention. Provides tools for thinking of ways to stop the transmission of HIV, emphasizing education and health policy. The cultural aspects of HIV, including perspectives from sociology, law, economics, ethics, and politics. Students use their knowledge to complete a service learning project such as teaching high school students about HIV as part of a student speaker bureau. Extensive use of guest speakers and experts on HIV.

5 units (Siegel) not given 2000-01

142C. Alternative Spring Break: AIDS and HIV in San Francisco
1 unit, Win (Siegel)

143. Globalization, Labor, and the Environment—Interdisciplinary examination of the responsibility of multinational corporations and institutions (World Bank, WTO, IMF) in the global economy, emphasizing labor and environmental standards in developing countries. Local and global case studies and research focus on social justice and empowerment for domestic and foreign victims of labor, environmental and human rights abuses, the role of certain multinational institutions and corporations in those abuses, and potential tools for holding these bodies more accountable. Service-learning component with Bay Area organizations.

4 units, Win (Rosencranz)

144. Guilt: Multidisciplinary Perspectives—The experience of guilt and shame from the perspective of the individual. The development of the sense of guilt in childhood; behaviors commonly associated with guilt; its role in interpersonal relationships; communal interactions; its psychopathology, and cross-cultural and gender differences. Conceptions of guilt and shame from the perspectives of major religious and philosophical traditions, and recent interpretations from evolutionary psychology. Prerequisite: majors in Human Biology, Religious Studies; joint majors in Religious Studies and Philosophy; or consent of instructor.

4 units, Spr (Katchadourian)

145. Children's Citizenship: Justice across Generations—(Enroll in Political Science 158R.)
3 units, Win (Reich) given 2001-02

147. Controlling Climate Change in the 21st Century—The science, economics, and environmental diplomacy of global climate change. Topics: the science of climate change, climate change and global environmental law; economic approaches to global carbon abatement, including taxes and tradable permits; joint implementation and the clean development mechanism; the role of the European Union; gaining the support of China, India and other developing countries; prospects for support from the U.S. Congress and U.S. corporations: new energy technologies for less carbon-intensive electric power and transport. Enrollment limited to seniors.

3 units, Aut (Schneider, Rosencranz)

150. Gender-Specific Perspectives on Birth Control—In most societies, human fertility control responsibility rests predominantly with women. Is this desirable and realistic, or should changes be instituted? Groups of four to five students of diverse backgrounds and different professional interests (medicine, law, economics, religion, sociology, political science) develop a series of position papers dealing with new birth control procedures suitable for populations of different cultural and socioeconomic backgrounds with gender-specific considerations. Part I: lectures, selecting population groups and multi-disciplinary task forces, and individual discussions with each task force. Part II: library and field work, writing task force reports, and oral presentations. Limited to 20 seniors; juniors considered in exceptional circumstances. GER: 4c (DR: T)

6 units (Djerassi) given 2001-02

151. The Rise of Scientific Medicine—(Enroll in History 33A.)
5 units (Lenoir) not given 2000-01

152. Environmental Policies and Institutions in Developing Countries—The tension between environmental protection and economic growth in eight developing countries: Egypt, Russia (Siberia), China, India, Indonesia, Nigeria, Mexico, and Ecuador. Each student is responsible for an environmental profile of a chosen developing country. Prerequisite: 135 or consent of instructor.

5 units (Rosencranz) not given 2000-01

154. Biosocial Aspects of Cancer—Recent advances in the biology, diagnosis, and treatment of cancer. The social and economic ramifications of being diagnosed and treated for cancer. What are the present options for cancer treatment and what new technologies may change these options in the future? New diagnostic techniques for the early detection of cancer. The use of predictive assays to determine the most effective treatment modality—chemotherapy, radiotherapy, surgery, hyperthermia, immunotherapy, etc.

4 units, Spr (Giacca)

155. Exercise Physiology—Overview of human exercise physiology. Focus is on how body systems respond to the stress of acute exercise and how those systems adapt to chronic exercise training. Topics: how the cardiovascular system adapts to oxygen delivery and utilization, how muscles generate force and how they hypertrophy in response to training, how metabolic pathways are regulated to support the increased energy demand of exercise, theories on the causes of fatigue and muscle soreness, and theories on what limits human performance. How exercise capacity is influenced by aging, gender, and environmental conditions, e.g., high altitude, heat, and cold. Prerequisite: Human Biology core or consent of instructor.

4 units, Aut (Friedlander)

156. Human Development—The biological, medical, and social aspects of normal and abnormal human development. Topics: in vitro fertilization and embryo transfer; gene and cell therapy; gametogenesis; pattern formation in the nervous system and limb development; gene activity in early development; cell recognition at fertilization; twinning and grand multiple pregnancies; miscarriage, in utero effects of teratogens; sex determination and differentiation; growth control; gigantism and dwarfism; neural tube defects; cardiac morphogenesis; progress in the developmental biology of humans. Limited enrollment. Prerequisites: Human Biology or Biological Sciences core, or consent of instructor.

3-4 units (Porzig) not given 2000-01

158. Fishing for Solutions: Issues in Marine Conservation—(Enroll in Anthropological Sciences 166B.)
3-5 units, Win (Novy)

159. Sports Medicine—(Same as Medicine 260.) For medical students and upper-division Human Biology undergraduates. Overview of sports medicine and sports science topics. The themes of sports, exercise, health, and medicine are integrated throughout the entire human performance continuum, from the use of exercise as a form of therapy to the injuries and illnesses that result from sports and exercise. Content in the basic and applied sciences is from physiology, nutrition, psychology, and biomechanics. Medical topics in the problems exacerbated or caused by exercise and sport; maximizing performance in elite athletes; and population-based issues such as exercise and its relationship to health, women's issues, drugs in sport, and exercise and aging. Prerequisite: medical school enrollment or upper-division Human Biology standing or consent of instructor.

4 units, Win (Cooper)

160. Health Care in America—Overview of the health care system in the U.S., examining several key organizations and institutions that shape health policy and health care delivery. By understanding the forces that affect health and health care, students assess more critically options for health care reform.

3 units, Aut (Barr)


160A. Seminar in American Health Policy—Key issues surrounding health care reform, and the policy-making process as it pertains to health care. Student presentations of assigned readings, followed by discussion. Prerequisites: 160 and consent of instructor.

3 units, Spr (Barr, Lee)

160B. Senior Honors Colloquium in Health Policy and Social Issues—Open to seniors admitted to the honors program, by consent of instructor. Assists students doing honors research pertaining to health policy. Weekly discussion centers around students' presentations of honors projects, the policy issues involved, and the structure of the proposed research. Prerequisite: consent of instructor.

1 unit, Aut, Win, Spr (Barr, Lee)

160W. Seminar in Federal Health and Environment Programs/Agencies—Priority enrollment for students going to Stanford in Washington, Winter Quarter. Introduces health policy making in Washington, D.C., with an emphasis on understanding the agencies within the federal government responsible for developing and carrying out health policy. Weekly lectures/discussions. Enrollment limited to 25.

3 units, Aut (Lee)

161. Darwin, Evolution, and Galapagos—(Same as Anthropological Sciences 131.) Seminar on Darwinian theory as applied to the evolution of flora and fauna on the Galapagos Islands. Darwin's observations in Galapagos, and their role in the formulation of his theory of evolution; recent research in Galapagos and its implications for our understanding of evolution today. The impact of human activity in Galapagos and emerging conservation issues. Lectures, discussions, and optional field trip to Galapagos (at extra expense, limited capacity). Enrollment limited to 20.

5 units (Durham) not given 2000-01

162. Primate Evolution—(Enroll in Anthropological Sciences 131A.)

5 units, Spr (Jablonski)

163. South Asia: Environment, Development, and Security—(Enroll in International Relations 137.)

5 units, Spr (Rosencranz)

164. Ecology and Equity—(Enroll in Anthropological Sciences 168A.)

5 units, not given 2000-01

165. Environmental Justice—(Enroll in Anthropological Sciences 168B.)

5 units, Aut (Lu)

166. Evolution of Primate Intelligence—(Enroll in Anthropological Sciences 131C.)

5 units, Spr (Maggioncalda)

167. International Health—Introduction to concepts of health and wellness and the major descriptors and determinants of health status, international organizations and control programs, specific disease-related problems within particular population groups from an epidemiologic viewpoint, examples of health care delivery methods, analysis of efforts to improve health through examination of specific programs and projects currently underway and previously implemented. Emphasis is on the cultural, economic, and political context in which all questions/issues in international health exist. Prerequisites: Human Biology core or consent of instructor.

3 units, Spr (Wang)

168. Medical Anthropology—(Enroll in Anthropological Sciences 170.)

5 units, Aut (Barnett)

169. Critical Issues in International Women's Health—Overview of international women's health issues in the context of a woman's life, from childhood, through adolescence, reproductive years, and aging. The approach to women's "health" takes into account economic, social, and human rights factors, and the importance of women's capacities to have good health and manage their lives in the face of societal pressures and obstacles. Emphasis is on those critical issues of women's health that mean life or death to women, depending on their capacity to negotiate and/or feel empowered (e.g., unwanted pregnancy, violence, HIV/AIDS, access to abortion, sex trafficking). Information about women's organizations outside the U.S.

4 units, Win (Firth-Murray)

170. Social Policy for Sustainable Resource Use—(Enroll in Anthropological Sciences 267.)

5 units (Irvine) not given 2000-01

172. Indigenous Forest Management—(Enroll in Anthropological Sciences 166A.)

5 units, Aut (Irvine)

173. Medical Ethics—(Enroll in Philosophy 78.)

4 units, Spr (Jaworska)

174. Ethics and Politics in Public Service—(Enroll in Political Science 159R.)

5 units, Win (Reich)

175. Virtual Vertebrates—Computer simulations of the biomechanics of aquatic locomotion in vertebrates such as fishes and cetaceans. Development and testing of educational software on the anatomy, physiology, and biomechanics of swimming vertebrates. Possible organisms: lungfish, eels, lamprey, tuna, sharks, rays, turtles, penguins, dolphins. Estimation and resolution of the biomechanical forces affecting lift, thrust, and drag. Computer lab-based weekly meetings. Enrollment limited to 10. Prerequisites: 110, consent of instructor.

3 units (Porzig) not given 2000-01

176. Bodies and Machines: From Descartes to Frankenstein—(Enroll in Science, Technology, and Society 131.)

3-5 units, Aut (Wilding)

179. Advanced Neurosciences Laboratory—(Enroll in Biological Sciences 209.)

4 units, Win (Heller, Grahn)


5 units, Aut (Maggioncalda)

181. Evolutionary Anthropology—Upper-division/graduate seminar focused on the concept of evolution as used in anthropology. Evolutionary theory in biological anthropology, as applied to hominid evolution and human population genetics. Evolutionary approaches to culture and social organization, including social evolution, sociobiology, and evolutionary culture theory. Enrollment limited to 20.

5 units (Durham) not given 2000-01

182. Urban Environmental Policy—(Enroll in Urban Studies 182.)

4 units, Win (Hall, Kibel)

183. Hunter-Gatherers in Archaeological Perspective—(Enroll in Anthropological Sciences 141.)

5 units, Win (Rick)

185. Science and Religion—(Enroll in Religious Studies 270.)

4 units, Aut (Bergman, Eisen)
HONORS, INTERNSHIP, AND SPECIAL PROJECTS

190. Honors Seminar for Sophomores—Introduction to the process of doing honors research and writing the final thesis. Guest speakers discuss various aspects of honors research. Students attend at least one of the Honors Symposium presentations in May. Prerequisite: consent of instructor. (AU)
   1 unit, Spr (R. Fernald)

191. Honors Seminar for Juniors—Open to juniors considering honors work in Human Biology. Weekly survey of faculty research areas. Writing honors proposals, research grant applications, and Human Subjects Committee approval. Speakers include honors students, faculty, and statistical and writing consultants. (AU)
   1 unit, Win (Feldman)

192. Research in Human Biology—Independent research conducted under faculty supervision, taken junior or senior year, normally (but not necessarily) in pursuit of an honors project. May be taken more than one quarter for credit. Students must complete application in student services office.
   1-5 units

194. Honors—Completion of the honors project, normally taken in the student’s final quarter. First component: the honors thesis, a final paper providing evidence of rigorous research, fully referenced, and written in an accepted scientific style. Second component: participation in the honors symposium, including a 10-minute oral presentation followed by a brief question and answer session. Prerequisites: 193 (or 199), and acceptance into the honors program.
   1-10 units (Staff)

195. Internship in Human Biology—Limited to and required of Human Biology majors. Combines course work with a supervised field, community, or lab experience of student’s own choosing. Must be arranged in advance and initiated at least three quarters prior to graduation.
   4 units (Staff)

197. Service-Learning Internship in Community Health—(Fulfills the Human Biology internship requirement.) Provides 100 hours of work in service capacity with a non-profit, community health agency. Students are required to go through an orientation to their community and participate in organized reflection activities throughout their experience. Prerequisite: consent of instructor and admittance into the Human Biology Service-Learning Program.
   4 units (Barr)

198. Senior Tutorial—Intensive reading course for Human Biology majors in exceptional circumstances and under sponsorship of Human Biology associated faculty. Students must apply through Human Biology Student Services before registering. Reading list, paper, and evaluation required.
   1-5 units (Staff)

199. Directed Reading/Special Projects—Independent study open to Human Biology majors and non-majors. Human Biology majors must obtain a sponsor from the Human Biology associated faculty or the academic council. Non-majors and/or students who have not declared must obtain a sponsor only from the Human Biology associated faculty. Students must complete application in student services office.
   1-4 units (Staff)

200. Teaching of Human Biology—For upper-division undergraduate and graduate students. Practical experience in teaching Human Biology or serving as an assistant in a lecture course.
   1-5 units (Staff)

OVERSEAS STUDIES

Descriptions of these courses are in the “Overseas Studies” section of this bulletin or at the Overseas Studies office, 126 Sweet Hall. Students overseas are encouraged to participate in a wide range of internships and independent research as well.

106H. Man-Environment Interactions: Case Studies from Central Chile—Santiago.
   5 units, Aut (Hajek)

   4 units, Win (Giraud)

   4 units, Win (Birch)

INTERDISCIPLINARY STUDIES IN HUMANITIES

Emeriti: (Professors) Kurt Mueller-Vollmer, Lawrence V. Ryan
   Director: Paul Robinson
   Associate Director and Senior Lecturer: Helen Brooks
   Lecturers: Edward Steidle (Winter), Lawrence Zaroff (Spring)
   Consulting Associate Professor: John Van Natta (Winter)

Steering Committee: (Chair) Paul Robinson (History); Helen Brooks (English, Interdisciplinary Studies in Humanities), Gregory Freidin (Slavic Languages and Literatures), Brad Gregory (History), Karen Kenkel (German Studies), Hilton Obenzinger (English), Rush Rehm (Drama), Zack (Graduate Program in Humanities student representative)

The office of Interdisciplinary Studies in Humanities administers the following programs:

1. Honors Program in Humanities

2. Interdisciplinary Major in Humanities
   a) Option I: Interdisciplinary Major
   b) Option II: Interdisciplinary Major for students preparing for careers in the health sciences (premedical, predental, and so on)

3. Graduate Program in Humanities
   a) Master of Arts
   b) Joint Ph.D.

4. American Studies (see the “American Studies” section of this bulletin.)

5. Medieval Studies (see the “Medieval Studies” section of this bulletin)

6. Program in Modern Thought and Literature (see the “Modern Thought and Literature” section of this bulletin.

432
UNDERGRADUATE PROGRAMS

See also the “Honors Program” below.

BACHELOR OF ARTS
THE MAJOR IN INTERDISCIPLINARY STUDIES IN THE HUMANITIES

This undergraduate major is designed for students with a strong commitment to interdisciplinary study in the various humanities. A student may choose to pursue the A.B. degree in Humanities through one of two concentration options: (i) the standard student designed thematic concentration, or (ii) the concentration designed for students who also plan to complete the established “premedical” curriculum for careers in the health sciences.

Unlike the empirical disciplines in natural and social sciences, the humanities focus on the formation of ideas through language. The goal of the program is to acquaint students with the differences of disciplinary methods as well as their intersections, where meaning, history and communication are produced. Students interested in Interdisciplinary Studies in Humanities have the opportunity to arrange their courses by thematic subject matter, by genre, or by nationality. At the same time, advanced interdisciplinary seminars provide a rigorous context in which to develop the skills for in-depth study about how culture, history, art, and philosophy intersect.

All majors submit a study plan, accompanied by a “statement of purpose” which outlines the rationale for a concentration. Students who wish to major in Humanities should receive approval of their concentrations before the end of the junior year.

OPTION I

Students may devise concentrations in modern thought and literature that incorporate modern literature, cultural history, and critical theory, or in other period specific areas such as early modern studies or medieval studies. Students may also devise concentrations such as cultural, film, or performance studies; politics and literature; or popular culture.

Generally the program must include at least twelve courses over and above the requirements of the honors program for a minimum of 60 units. Each of the twelve courses is designated to fall within one of the following three categories: literary/cultural study, historical study, or philosophical study.

1. Six courses in one of the three areas above (30 units)
2. Three courses in each of the other two areas above (30 units)
3. The core colloquium (2 units)
4. Three Humanities Core Seminars (15 units)
5. An essay proposal (2 units)
6. A senior honors essay (10 units)
7. Proficiency in a foreign language

If additional courses are needed to make up the 60 unit minimum, the student may take those courses in any of the three categories. Each program of study must be signed by a Stanford faculty member who has agreed to act as the student’s academic adviser; the proposed program must then be approved by the chair. Changes in the study plan must be approved by the student’s adviser and must be kept on file in the program office.

Competence in reading a foreign language is required of all Humanities majors who choose to design a thematic concentration, and must be certified by appropriate course work or equivalent. Competence is generally considered to be acquired after the completion of five quarters of college-level study, but may also be certified by other means. Consult the student handbook for such recommendations.

OPTION II

The Interdisciplinary Major in Humanities offers an option for students who are preparing to attend medical school, but who wish to focus their studies in the humanities. This concentration gives students a coherent way to organize interdisciplinary interests by theme, nationality, or period. In addition, students choosing this option take all the courses usually required by medical schools (two years of organic and inorganic chemistry with labs, one year of physics, one year of biology with labs, and one or two courses to provide proficiency in quantitative skills as determined by a premed adviser), as well as course work in various humanities disciplines along with the Humanities Honors Program (69 units) distributed as follows:

1. Four courses in the student’s chosen area of concentration (national culture, culture, philosophy, historical period, film, genre, theme). Generally these four courses address different aspects of literature, history, and philosophy (20 units).
2. Three courses in medical ethics, history or philosophy of science, ethics, science and literature or science and the arts (15 units)
3. One course in the arts (5 units)
4. The Core Colloquium (2 units)
5. Three Humanities Core Seminars (15 units)
6. An essay proposal (2 units)
7. A senior honors essay (10 units)

When selecting courses, a student choosing this option is expected to define the focus in a brief “statement of purpose” approved by the chair. For either option, the A.B. degree conferred is in Humanities. Students choose a concentration title that reflects the focus of their study and this is noted on the transcript after degree conferral.

HONORS PROGRAM

The Honors Program in Humanities aims to heighten a sense of the relations among various humanistic disciplines, and to study issues in intellectual and cultural history through aesthetic, literary, historical, social, and ethical values.

ADMISSION

As an extradepartmental honors program, the Humanities Honors Program is open to any qualified undergraduate at Stanford, regardless of major. Interested freshmen and sophomores may obtain information from the program office. Students should register for the program at the earliest opportunity, preferably Spring Quarter of the freshman year. Students must meet the following entrance requirements before being admitted to the program:

1. Completion of all at least two quarters of the Area One requirement, except in the case of transfer students, who will be granted exception.
2. A grade point average (GPA) of at least 3.3 (B+) in all course work in the humanities. Such course work includes any Area One sequence and all Writing and Critical Thinking sections; all courses in the departments of Art and Art History, Drama, and Music (except studio or performance courses); all courses in the departments of Asian Languages, Classics, English, French and Italian, German Studies, Slavic Languages and Literatures, and Spanish and Portuguese (except first-year language courses); all courses in the departments of Comparative Literature, History, Philosophy, and Religious Studies; and all courses in the programs in Feminist Studies and Modern Thought and Literature.

REQUIREMENTS

1. Completion of 100, Core Colloquium: Humanities, 2 units, preferably in the sophomore year.
2. Two different seminars in the series 190-198: 10 units, sophomore, or junior year. Both seminars must be completed by the end of the tenth quarter of undergraduate study in order for students to remain members in good standing.
3. A third seminar, either chosen from the 190-198 series, or from the list of affiliated seminars available from the program office, also to be completed by the end of the tenth quarter of undergraduate study.
4. Unless students have strong intellectual reasons for doing otherwise, they must fulfill their World Cultures (GER Area 4a) and American Cultures (GER Area 4b) requirements from courses offered in humanities disciplines.
5. In order to develop the requisite knowledge and methodological background to write a Humanities honors essay, students must take, during their sophomore and junior years, the required Humanities honors courses and additional humanities courses in disciplines of their interest.

6. Enrollment in 200A, one unit each, Autumn and Winter quarters of the junior year.

7. An honors essay on a topic approved by the Steering Committee (usually 5 units Autumn Quarter and 5 units Winter Quarter, senior year).

8. A minimum GPA of 3.3 (B+) in all courses taken for the Honors Program, as well as an overall minimum GPA of 3.0 (B) in all course work in order to remain in the program.

GRADUATE PROGRAMS

University requirements for the A.M. and Ph.D. degrees are described in the "Graduate Degrees" section of this bulletin.

MASTER OF ARTS

Application is made through the Interdisciplinary Studies in Humanities office. (Application forms are available from Graduate Admissions, Registrar's Office, Old Union, Stanford University, Stanford CA 94305-3005, or on the web.) The A.M. program in Humanities is ideally completed as a half-time, two-year program, but under some circumstances it may be completed in one year as a full-time program. The department does not offer financial aid for the master's program. Qualified undergraduates at Stanford may petition to complete the A.M. program coterminally with their bachelor's degrees. The deadline for applying to the A.M. program is March 1 for both outside and coterminal applications.

REQUIREMENTS

1. Reading knowledge of at least one foreign language, to be completed prior to admission to the A.M. program.

2. Complete the five Interdisciplinary Studies in Humanities seminars (311-315).

3. Complete four graduate-level courses in an approved "established discipline," to be determined in consultation with the chair. One of these must be a graduate-level research seminar for which a research paper is required (this paper must be filed in the department). Under "Statement of Purpose" on the application form, the candidate must indicate the established discipline (for example, art history, classics, philosophy, and so on) from which the graduate-level courses are drawn. The candidate must also note his or her qualifications for undertaking graduate study in that discipline. Once admitted, the student submits a proposed program of study to the chair, specifying the particular courses to be taken. The proposed program is approved on its own merits to ensure that the chosen graduate courses are suited to the A.M. in Humanities.

4. Satisfactory completion of 298, the (Spring Quarter) Graduate Program in Humanities Symposium, or prior completion of the Symposium Paper by special permission.

The minimum number of units for the A.M. degree is 36. Additional elective units may be taken at the option of the student.

Undergraduates wishing to pursue the A.M. as part of a coterminal program should speak with the department administrator about the application procedures for coterminal students.

JOINT Ph.D.

The Graduate Program in Humanities (GPH) provides graduate students in different disciplines an opportunity to broaden their knowledge of intellectual and cultural history by focusing on texts and ideas which have been central to all humanistic disciplines from classical Greece to the present. The program's seminars usually focus on specific topics or issues in the context of historical, literary, philosophical, and other disciplinary and theoretical orientations. The program provides a unique opportunity to study highly influential texts with a view to their relevance to the student's own disciplinary field.

Because the GPH supplements, and does not substitute for, department specialties, its members must be students earning the Ph.D. in an academic department at Stanford.

Students may register for the program at any time, usually during the first quarter of graduate study. Members of the program are given first preference in registration for all of its offerings. Normally, the program involves taking 311-314, followed by 315, the core seminar on interdisciplinary study in the humanities. The course of study culminates in the GPH student symposium, which is developed and organized by the students in the program.

Although students in the GPH generally complete the program coursework in their first two years of graduate study, requirements of some participating departments may necessitate completion of the GPH over three years. In some instances, one or more of the GPH seminars may fit within the requirements of the student's home department.

The departments of Art and Art History, Classics, Drama, English, French and Italian, German Studies, History, Modern Thought and Literature, Music, Philosophy, Religious Studies, Slavic Languages and Literatures, and Spanish and Portuguese all participate in the GPH. Doctoral students from other departments may participate with permission of their home departments and approval of the Chair of Interdisciplinary Studies in Humanities.

REQUIREMENTS

1. Continue satisfactory work in the student's major field, in accordance with department requirements.

2. Complete the four chronologically ordered seminars (311-314) followed by the core seminar on interdisciplinary study in the humanities (315). To qualify for candidacy, students should complete at least three seminars in the first two years of graduate residence. Exemption from, or permission to audit, a seminar may be secured by petition if the student can show coverage of the material at an advanced level.

3. Participate in the GPH student symposium at the end of the second year of GPH course work (298; registration for units is optional).

4. At least one quarter of teaching for Interdisciplinary Studies in Humanities, normally a teaching internship in the third or fourth year; other interdisciplinary teaching may be substituted for this requirement by petition to the chair (299; registration for units is optional).

5. Reading knowledge of at least one foreign language, ancient or modern, to be certified in the first two years of graduate work.

6. Passing the University oral examination according to the schedule prescribed by the major department with one GPH representative, designated by the chair, as a member of the examining committee.

7. Submission of a Ph.D. dissertation acceptable to a committee which includes one representative of the GPH, designated by the chair.

COURSES

See quarterly Time Schedule for changes in listings.

33A,B Gender and Genre—(Enroll in Introduction to the Humanities 33A,B.)

33A. 5 units, Win (McCall)
33B. 5 units, Spr (Brooks)

100. Core Colloquium: Humanities—Required of all students in the Humanities Honors Program, to be taken in the sophomore year. Inquiry into the nature of disciplinary and interdisciplinary studies.

2 units, Win (Brooks, Robinson)

191-198. Interdisciplinary Core Seminars in Humanities—Students in the Humanities Honors Program must complete three different seminars from different areas before the end of the tenth quarter of undergraduate study (one seminar may be taken from the list of "affiliated seminars" available in the program office). Other students may enroll if space allows and with the instructor's consent.
The natural association between the history of medicine and literature has been insufficiently explored despite the mutual benefits of such an alliance. This collaboration is innate because medicine, like literature, is primarily concerned with pain and suffering, living and dying. "We seek in fiction and history the knowledge of death and dying," which in our own lives is denied to us. Medical experience is "the most profound experience of human life because it is our own," and literature is "the work of Kubler-Ross as a foundation." Medical experience is limited by time. Writings, from literature and the history of medicine, put their conflation leads to an understanding of illness. Voices from patients, guest doctors, and films.

5 units, Spr (Zaroff)

200A. Senior Research—Limited to Humanities honors students. A critical essay of about 15,000 words. Students develop a proposal beginning in Winter Quarter of the junior year, and research a topic and write the essay during senior year, taking a total of 5 units each of 200B and 200C, spread out during senior year as best suits their schedules. Deadline for submitting essays is the first working day on or after May 15.

200A. Research Proposal—Preliminary planning and study. Students drafts a proposal in Winter Quarter of the junior year to submit to the Committee in Charge for suggestions regarding focus and bibliography. After revisions, the student resubmits a fully developed proposal to the committee for additional comment and/or final approval. 60 hours over two quarters are expected of students developing their essay proposals for 2 units, usually 1 unit each in winter and spring of the junior year. Students usually make revisions of some kind in either scope or formulation of the topic. Students overseas submit proposals and receive feedback by fax or e-mail.

1-2 units (Robinson)

200B. Senior Research—Regular meetings with thesis advisor. Prerequisite: 200A. 1-5 units (Robinson)

200C. Senior Research—Regular meetings with tutor; submission of complete first draft at least two weeks before final deadline. Final grade is assigned by the program chair based on evaluations received from the student's tutor and a second reader appointed by the committee. Prerequisite: 200B. 1-5 units (Robinson)

GRADUATE

275. Directed Reading
1-5 units (Staff)

298. GPH Symposium—Required of doctoral and master's students in the GPH. Participation in the student-organized symposium: presentation of a paper informed by texts addressed in GPH seminars. 1-3 units, Spr (Robinson)

299. Teaching Internship—Required of doctoral students in the GPH. Preparation for teaching in interdisciplinary programs. Closely supervised teaching responsibilities in the Humanities program courses. 1-3 units (Brooks)

311,312,313,314,315. Graduate Program in Humanities Seminars—Required of students in the GPH. Open to other graduate students by consent of the instructor.

311. Classical Seminar: Early Christianity—Text and Art—Significant events and issues in Christianity's emergence as a religious "culture," 100-700 A.D. Each week, a text and a related piece or program of art/architecture open such topics as Christianity's appropriation of Greek and Roman models of thought, religious competitions intellectual and "muscular," and intersections and diversions of piety and politics. 3-5 units, Aut (Gregg)

312. Medieval Seminar—The major cultural, literary, and artistic trends of the medieval period from the fall of the Roman Empire to the threshold of the Renaissance. Emphasis is on the Germanic ethos and the heroic ideal, the courtly love tradition and the development of romance literature, and the Gothic vision and the Scholastic synthesis. Texts: Beowulf, The Song of Roland, Beroul, Marie de France, Chrétien de Troyes, Dante, Boccaccio, etc. 3-5 units, Win (Steidle)

313. Renaissance/Early Modern Seminar—Focus is on this period as it records the impact of major historical forces: the advent of print-
INTERNATIONAL POLICY STUDIES

Director: Judith L. Goldstein (Political Science)
Deputy Directors: Coit D. Blacker (Institute for International Studies),
   David W. Brady (Business, Political Science)
Faculty Committee: Stephen H. Haber (History), Thomas C. Heller
   (Law), Stephen D. Krasner (Political Science), Ronald I. McKinnon
   (Economics), Norman M. Naimark (History)
Lecturers: Alison Alter (Political Science), Gili S. Drori, Ronald Mitchell
   (International Policy Studies), Neeraja Sivaramayya (International
   Policy Studies)
Affiliated Faculty: David B. Abernethy (Political Science), Jonathan
   Bendor (Business), John Cogan (Hoover Institute), Walter P. Falcon
   (Institute for International Studies), David L. Freyberg (Civil and
   Environmental Engineering), Avner Greif (Economics), Simon Jack-
   man (Political Science), Timothy E. Josling (Institute for International
   Studies), Anne O. Krueger (Political Science), Michael McFaul
   (Political Science), James D. Morrow (Hoover Institution), Roger G.
   Noll (Economics), Michel C. Oksenberg (Institute for International
   Studies), Robert A. Packenham (Political Science), Douglas Rivers
   (Political Science), Scott D. Sagan (Political Science)
Other Affiliation: Walter J. Stone (Political Science), Barry O’Neill
   (Political Science)

GRADUATE PROGRAM
MASTER OF ARTS

University requirements for the A.M. degree are described in the
“Graduate Degrees” section of this bulletin.

International Policy Studies (IPS) is a highly analytical interdisciplinary
program focusing on international political analysis. Its goal is to
provide students with in-depth exposure to a range of issues that they will
face in the 21st century in international business and public policy, and
to develop a foundation of skills and knowledge to address those issues.
The program allows students to focus on: the international economic
system, developing and transition societies, security issues, or the world
environment.

IPS requires completion of the core and cognate requirements listed
below which normally amount to 48 units of credit. Additional units are
required for students who have not fulfilled the prerequisites for these
requirements.

ADMISSION

IPS is designed for students who have a strong undergraduate back-
ground in economics and political science. To enroll in the program, stu-
dents must have taken at least one undergraduate course in international
relations, as well as calculus-based undergraduate courses in statistics,
microeconomics, and macroeconomics. Stanford courses satisfying these
requirements are Political Science 35 or International Policy Studies 204,
and Economics 51, 52 and 102A. In addition, to fulfill the program
requirements in one year, students must have completed one advanced
undergraduate course in international economics, and in either security
studies or international political economy. Stanford courses that meet
these requirements are Political Science 134A and 134B, and Econom-
ies 165.

Applicants from schools other than Stanford or applicants from
Stanford who did not apply in their senior year should submit the Grad-
uate Admission Application form and provide a statement setting forth
relevant personal, academic, and career plans and goals; transcripts; three
letters of recommendation; Graduate Record Examination (GRE) scores;
and a writing sample of at least ten pages. Applications can also be filed
by accessing the World Wide Web through the University Registrar’s web
Applicants are expected to have an A.B. or B.S. degree from an accred-
ited school. Applications for admission beginning Autumn Quarter must
be filed together with supporting credentials by the preceding January
15.

Undergraduates at Stanford may apply for admission between their
ninth and eleventh quarters. The application requires an official, current
transcript, two letters of recommendation from University faculty, a
course paper of at least ten pages, and a statement of relevant personal,
avademic, and career plans and goals. Students enroll in the program in
the Autumn Quarter following completion of all of their undergraduate
requirements including at least 180 units and, if graduating with honors,
a senior thesis. Application is made through the International Policy
Studies office. The closing date for filing applications and supporting
credentials is January 15 of the senior year.

DEGREE REQUIREMENTS

To receive the A.M. degree in International Policy Studies, students
must complete the items below. Normally, these requirements entail 28
units of core courses and an additional 20 units from the cognate curric-
ulum; exceptions are made with the written approval of director of the
program. These courses have the following prerequisites, which can not
be counted toward any of the IPS degree requirements or for an area spe-
cialization: Economics 51, 52, 102A and 165; Political Science 35 or IPS
204, 134A or 134B.

Core (28 units)—
   Policies (3 units)
2. Skills Requirement: any three of the following seven courses (total-
   ing 15 units)—Economics 102B, 102C; IPS 201; Political Science
   200B, 202; Public Policy 104, 150 (5 units each)
   Economics (5 units)
4. Foreign Policy Requirement: one of the following: Political Science
   241 or 241B (5 units)

Cognate Curriculum (20 units)—Students must take 20 units of oth-
er IPS approved courses, at least 10 units of which must be in one of the
following areas of specialization (a complete list of the courses available
in these areas is available in the IPS Program Office, Building 60):
International Political Economy
Conflict/Security Studies
World Environmental Problems
Political and Economic Development
Public Organizations and Policy Implementation

Area Specialization—Students may earn an area specialization certificate by completing 15 additional units focusing on one region. Options include Asia, Eastern Europe/Russia, Latin America, and Western Europe.

Master's Thesis—Students are not required to write a master's thesis; however, students may take up to 10 units of thesis research under the guidance of a faculty member as part of their electives. In addition, students must meet the following deadlines:

1. Complete and file the IPS Program Proposal, available in the IPS office, no later than the second week of Autumn Quarter. All students should list all courses that will be used to fulfill the IPS requirements (including the required IPS 200 course). Categorical students must list unduplicated courses, that is, courses not counted toward an undergraduate degree.

2. Use Axess to file an Application to Graduate by the appropriate deadline, and complete and file the IPS Program Requirement Completion Worksheet with the IPS office.

Grade Requirements—All courses must be counted toward the 45 units must be taken for a grade of a 'B-' or higher.

Financial Aid—Undergraduates may petition for a fifth year of financial aid as categorical students. Note that these petitions can only be made if the undergraduate degree has not been conferred. University-based financial aid is not normally available for graduate students entering the IPS program.

COURSES

Please refer to the IPS Degree Requirements sheet (available in the IPS Program Office) for information on additional courses.

CORE

SEMINAR REQUIREMENT


3 units, Aut, Win, Spr (Goldstein)

SKILLS REQUIREMENT

Any three of the following seven classes:

201. Advanced Econometrics—The basic econometric techniques essential to understanding and evaluating empirical research in social sciences. Focus is on regression analysis and its extension, providing basic “hands-on” experience with regression analysis and a working knowledge of statistical theory. Topics: ordinary least squares (OLS), multivariate regression analysis, heteroscedasticity, serial correlation, and limited dependent variables.

5 units, Win (Sivaramayya)

ECONOMICS

102B. Introduction to Econometrics

5 units, Win (Vylacil)

Spr (Bresnahan)

102C. Advanced Topics in Econometrics

5 units, Spr (Pistaferrri)

POLITICAL SCIENCE

200B. Statistical Methods II

5 units, Win (Staff)

PUBLIC POLICY

105. Quantitative Methods and their Application to Public Policy

5 units, Spr (Rothwell)

INTERNATIONAL ECONOMICS REQUIREMENT

202. Issues in International Economics—Topics in international trade and international macroeconomics: “new” trade theory, tariff and non-tariff trade barriers, international factor mobility, regional trading arrangements, trade and the environment, trade and development, exchange rate determination, international financial policy, and the international monetary system. Prerequisite: Economics 165 or equivalent.

5 units, Spr (Sivaramayya)

FOREIGN POLICY REQUIREMENT

One of the following two courses:

241B. Seminar: Decision Making in U.S. Foreign Policy—Priority is given to students in International Policy Studies. The formal and informal processes involved in U.S. foreign policy decision-making. The formation, conduct, and implementation of policy, emphasizing the role of the president and executive branch agencies. Theoretical and analytical perspectives are supplemented by case studies. Preparation of policy memorandum and substantial research paper or take-home final.

5 units, Spr (Blacker)

POLITICAL SCIENCE

241. Issues in International Political Economy

5 units, Win (Goldstein)

COGNATE

Students must take 20 units in the cognate curriculum, 10 of which must be from the same track. The five tracks are: International Political Economy, Conflict/Security Studies, World Environmental Problems, Political and Economic Development, and Public Organizations and Policy Implementation.

INTERNATIONAL POLITICAL ECONOMY

202. Issues in International Economics—Building on undergraduate-level international economics, economic theory is applied to current issues in international economics, relating theoretical economics to important policy issues. Trade theory and policy, exchange rate economics, open economy macroeconomics, and international monetary systems.

5 units, Spr (Sivaramayya)

204. Theoretical Issues in International Policy Studies—War and violent conflict are clearly common in international relations. In realms outside of national security (economic affairs, human rights, and environmental protection), states often miss obvious and important opportunities to solve problems through cooperation. The factors that make international cooperation possible, examining themes of continuity and change. The increasing economic, informational, and ecological interdependence of recent years is likely to change and reshape international relations in the future. Understanding these related questions; using causal analysis to understand other social problems.

5 units, Aut (Mitchell)

206. European Integration—(Same as Political Science 219A.) The political and economic factors shaping European integration from its inception to the present day. The evolution of the European Union and its governing institutions through the lens of several policy areas: agricultural, regional, monetary, regulatory, and foreign. Debates about democratic accountability, the future of the European Union, and the interplay between EU institutions and the domestic political arenas of member states.

5 units, Win (Alter)

230. Science, Technology, and Development—The role of science and technology in development, offering a global and sociological perspective. The phenomenal rates of global expansion of science, technology, and information technology, comparing among different nations and different world religions. The social impact of these trends: primarily concerning economic development, and general notions of progress.
(democratization, human rights, welfare of local populations, and national security). Current discussions regarding globalization, S&T policy, development debates, commodification of the public good, and notions of social change. The implications of science and technology globalization, as they shape the diverging trajectory of nation-states worldwide.

241. Seminar: Issues in International Political Economy—(Same as Political Science 241.) Open to master’s students and to advanced undergraduates. Critical examination of the major contemporary issues of global economic relations.
5 units, Win (Goldstein)

261. Comparative Political Economy of Post-Socialist Transitions—(Same as Political Science 121A.) The post-Socialist economic and political transitions ongoing in Eastern Europe and the former Soviet Union, investigating attempts to build market economies and democratic governments. The politics of constitutional choice and variation in reform strategies and outcomes across the cases. Prerequisites: Economics 1, Political Science 1 or 10.
5 units, Aut (Alter)

ECONOMICS

265. Open Economy Macroeconomics
5 units, Aut (Kumhof)

266. International Trade Theory
5 units, Win (Razin)

269. International Financial Markets and Monetary Institutions
5 units, Spr (McKinnon)

POLITICAL SCIENCE

215B. Chinese Politics: The Transformation and the Era of Reform
5 units, Win (Oi)

215D. Graduate Seminar: Approaches to Chinese Politics
5 units, Win (Oi)

215E. Graduate Seminar: Political Economy of Reform in China
5 units, Spr (Oi)

217. Seminar: Russia in Transition
5 units, Win (McFaul)

217M. Seminar: Evolution of the Chinese State
5 units, Win (Oksenberg, Miller)

218L. Seminar: Ethnicity and Nationalism in Soviet and Post-Soviet Politics
5 units (Lapidus) not given 2000-01

220W. Graduate Seminar: Politics, Economic Policy, and Economic Performance in Advanced Industrial Democracies
5 units, Spr (Wren)

223M. Seminar: Political Economy of Post-Communism
5 units, Spr (McFaul)

225. The Rise of Industrial Asia
5 units, Aut (Oi, Okimoto, Oksenberg, Rohlen, Rowen)

243C. Seminar: Theoretical Issues in International Political Economy
5 units, Spr (Goldstein)

245R. Seminar: The Transformation of Europe
5 units, Spr (Rice)

247L. Graduate Seminar: Human Rights Diplomacy
5 units, Spr (Lewis)

SOCIOLOGY

116. Comparative Sociology: Successor States of the Soviet Union
5 units, given 2001-02

214. Economic Sociology
5 units, Aut (Granovetter)

217A. China under Mao
5 units, Aut (Walder)

264. Firms, Markets and States
5 units, Win (Freeland)

CONFICT/SECURITY STUDIES

POLITICAL SCIENCE

138B. International Negotiation
5 units, Spr (O’Neill)

139B. Seminar: Foreign Policy Decision-Making
5 units (O’Neill) not given 2000-01

143S. Major Issues in International Conflict Management
5 units, Win (Stedman)

218L. Seminar: Ethnicity and Nationalism in Soviet and Post-Soviet Politics
5 units (Lapidus) not given 2000-01

234P. The Role of Technology in National Security
3 units, Aut (Perry)

243A. Graduate Seminar: International Relations Theory
5 units, Aut (Fearon)

243B. Seminar: Theoretical Issues in International Security
5 units, Win (Sagan)

247L. Graduate Seminar: Human Rights Diplomacy
5 units, Spr (Lewis)

5 units, Aut (Eden, O’Neill)

SOCIOLOGY

213. Institutional Theories of Nation-States and Other Organizations
5 units, Spr (Meyer)

POLITICAL AND ECONOMIC DEVELOPMENT

ECONOMICS

106. The World Food Economy
5 units, Win (Falcon, Naylor)

118. The Economics of Development
5 units, Aut (Chan)

214. Microeconomic Issues in Economic Development
5 units, Win (A. Krueger)

216. The Macroeconomics of Economic Development and Growth
5 units, Spr (Lau)

217. Money and Finance in Economic Development
5 units, Aut (McKinnon)
INTERNATIONAL RELATIONS

Director: Judith L. Goldstein (Political Science)

Faculty Committee: David Brady (Business), Coit D. Blacker (Institute for International Studies), Stephen H. Haber (History), Thomas C. Heller (Law), Stephen D. Krasner (Political Science), Ronald I. McKinnon (Economics), Norman M. Naimark (History)

Affiliated Faculty: Masahiko Aoki (Economics), Larry J. Diamond (Political Science), Peter Duus (History), Walter P. Falcon (Institute for International Studies), Lawrence H. Goulder (Economics), David J. Holloway (History), Simon Jackman (Political Science), Timothy Josling (Institute for International Studies), Kenan Jackson, Jr. (History), Terry L. Karl (Political Science), David M. Kennedy (History), Michael Kumhof (Economics), Gail Lapidus (Institute for International Studies), Mark I. Mancall (History), Isabella Mares (Political Science), Robert E. McGinn (Management Science and Engineering), Jean C. Oi (Political Science), Daniel I. Okimoto (Political Science), Susan M. Okin (Political Science), William J. Perry (Institute for International Studies), Richard Roberts (History), Debra M. Satz (Philosophy), James J. Sheehan (History), John B. Shoven (Economics), Thomas W. Simons (History), Andrew Walder (Sociology), John D. Wirth (History)

Other Affiliation: Alison Alter (Political Science), Anthony Angiletta (International Relations), Byron Bland (Education), Gerald A. Dornfain (Hoover Institute), Gili S. Drori, John Earle (Economics), David Holloway (Institute for International Studies), Ronald Mitchell (International Policy Studies), Barry O’Neill (Political Science), Armin Rosencranz (Human Biology).

International Relations (IR) is an interdisciplinary undergraduate major focusing on the study of the changing relations among nation-states (political, economic, and cultural). Students pursue a course of study in world politics that includes classes in political science, economics, history, and languages, focusing on a range of issues including international security, international political economy, political and economic development, and the politics of the transition to democracy. All International Relations majors must spend at least one quarter abroad and show two-year proficiency in a foreign language.

The International Relations program provides students with both the foundational skills and specific knowledge necessary to analyze the contemporary behavior of nations. The major prepares students for a variety of careers in government, non-governmental organizations, and business, both domestic and international. In addition, many IR students go on to graduate school either in law, business, economics, or political science.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

Requirements for the major (65 units) are:

1. Political Science 35
2. Either Political Science 134A or 134B or History 172A
3. Economics 1, 50, 51, or 52 plus two additional upper-division Economics courses from the IR course offerings lists.
4. At least one of the following skills classes:
   Economics 102A
   History 206
   Political Science 100A
   Statistics 60 (Psychology 10)
   Statistics 90
5. Specialization in one of three tracks by completing at least four additional courses from a specific list of classes. The three tracks are: Comparative Political and Historical Analysis (CPHA); Comparative Culture and Society (CCAS); Comparative and International Political Economy (CIPE). Specific classes may change. Consult the updated Course Offering lists available in the International Relations office or on the website at http://www.stanford.edu/dept/IR.
junior year.

Track requirements. Students must receive at least a grade of 'B+' in order to graduate with honors in International Relations or receive honors credit toward their degree requirements. Students admitted to the honors program spend three quarters in the Honors Colloquium and present a formal defense of their thesis, in addition to completing International Relations as a secondary major, or declaring a minor.

Minors

A minor in International Relations is intended to provide an interdisciplinary background allowing a deeper understanding of contemporary international issues. Students complete the minor by taking seven unduplicated courses from the IR curriculum, including the following:

1. Political Science 35
2. Political Science 134A and 134B
3. Four courses from one of the three tracks, or four courses relating to the same geographic region. Specific courses may change. Consult the updated Course Offering list available in the International Relations office.

Declaration of the minor must take place no later than the end of the second quarter of the junior year. To declare, first pick up the updated Course Offering list from the International Relations office and then access the Registrar’s Web page and select “Minor Declaration.”

Send questions by email to kp.ask@forsythe.stanford.edu.

Honors Program

The International Relations honors program offers qualified students the opportunity to conduct a major independent research project under faculty guidance. Such a project requires a high degree of initiative and dedication, significant amounts of time and energy, and demonstrated skills in research and writing.

In their junior year, students should consult with prospective honors advisers, choose the courses that provide academic background in their areas of inquiry, and demonstrate an ability to conduct independent research. Students should submit their honors thesis proposal during Spring Quarter of their junior year.

Prerequisites for participation include a 3.5 grade point average (GPA), a strong overall academic record, successful experience in writing a research paper, and submission of an acceptable thesis proposal. Students admitted to the honors program spend three quarters in the Honors Colloquium and present a formal defense of their thesis, in addition to enrolling each quarter with their faculty adviser. Under some circumstances, up to 10 units of honors thesis work may be used towards Track requirements. Students must receive at least a grade of 'B+' in order to graduate with honors in International Relations or receive honors credit towards their degree requirements.

Further details of the International Relations honors program are available from the program office.

Grants

The International Relations Program offers funds to students writing senior honors theses in international relations to finance travel to places where field work or library research is to be conducted, or to support intensive work at Stanford. The grants are intended for use by IR majors during the summer between their junior and senior years. The creativity and intellectual promise of the project and the preparation of the student are major considerations in awarding these funds. Applications are made during the Spring Quarter through the office of Undergraduate Research Opportunities at Stanford.

Graduate Program

Master of Arts

It is possible for students majoring in International Relations to work simultaneously for a coterminal master’s degree in a number of related fields. Coterminate students should consult advisers in both departments or programs to make sure they fulfill the degree requirements in both fields. For information on the A.M. program in International Policy Studies, see the “International Policy Studies” section in this bulletin.

Courses

(WIM) indicates that the course meets the Writing in the Major requirement for International Relations.

Core Economics


5 units, Aut (Taylor)
Win (Clerici-Arias)
Spr (Taylor, Clerici-Arias)

50. Economic Analysis I—Individual consumer and firm behavior under perfect competition. The role of markets and prices in a decentralized economy. Monopoly in partial equilibrium. Economic tools are developed from multi-variable calculus, using partial differentiation and techniques for constrained and unconstrained optimization. Prerequisites: Economics 1, and 50M or Mathematics 51, or passed diagnostic test (administered at the beginning of Economics 50) on multi-variable calculus. GER:2c (DR:4)

5 units, Aut (Levin)
Win (Tendall)

51. Economic Analysis II—Graduate students register for Economics 151G.) Introduction to neoclassical analysis of general equilibrium, welfare economics, imperfect competition, externalities and public goods, intertemporal choice and asset markets, risk and uncertainty, game theory, adverse selection, and moral hazard. Multivariable calculus is used. Prerequisite: Economics 50.

5 units, Aut (Meyer)
Win (Russell)
Spr (Kubler)

52. Economic Analysis III—Graduate students register for 152G.) Growth and fluctuations in the economic system as a whole. National income accounts and aggregate relationships among stocks and flows in markets for goods, labor, and financial assets. Economic growth, infla-
tion, and unemployment. The role of macroeconomic policies in the short and long run. Prerequisite: 50.
5 units, Win (D. Krueger)
Spr (Paal)

102A. Introduction to Statistical Methods—Introduction to statistical methods relevant to economics. Emphasis is on the description and examples of the use of statistical techniques. Probability: basic rules of probability, conditional probability, Bayes’ rule, discrete and continuous probability distributions. Point estimation, tests of hypotheses, confidence intervals, and linear regression model. Prerequisite: Mathematics 41 or equivalent. GER:2c (DR:4)
5 units, Aut (GER:3b) (DR:9)
Win (Amemiya)

HISTORY

172A. The United States since 1945—Analyzes foreign policy and politics, dealing with social themes and intellectual history. GER:3b (DR:9)
4-5 units, Win (Bernstein)

POLITICAL SCIENCE

35. International Politics—(Same as Political Science 135.) Approaches to the study of world politics including realism, liberalism, and decision-making theories. WW I, the nuclear weapons debate, and contemporary and economic problems. The normative and policy implications of different theories. GER:3b (DR:9)
5 units, Aut (Mitchell)

100A. Statistical Methods I—(Same as Political Science 200A.) Introduction to probability and statistical inference, with applications to political science and public policy. Prerequisite: elementary calculus.
5 units, Aut (Fearon)

134A. Strategy, War, and Politics—Traditional and modern theories on the causes of war and sources of peace. Contrasting explanations for the origins of WW I and II; alternative theories of deterrence in the nuclear age; the causes of war in the Persian Gulf, ethnic conflicts, and terrorism in the post-Cold War era. GER:3b (DR:9)
5 units, Spr (Sagan)

134B. America and the World Economy—Analysis of American foreign economic policy. Issues: the evolution of American tariff and trade policy, the development of mechanisms for international monetary management, and American foreign investment policy reflected in the changing political goals pursued by American central decision-makers. Prerequisite: Political Science 35 or equivalent. GER:3b (DR:9) (WIM)
5 units, Win (Goldstein)

STATISTICS

60. Introduction to Statistical Methods: Precalculus—(Graduate students register for 160; same as Psychology 10.) Emphasis is on techniques for organizing data, computing, and interpreting measures of central tendency, variability, and association. Estimation, confidence intervals, tests of hypotheses, t-tests, correlation, and regression. Possible topics: analysis of variance and chi-square tests, computer statistical packages. GER:2c (DR:4)
5 units, Aut (Holmes)
Win (Staff)
Spr (Walther)

90. Introduction to Statistical Methods for Social Sciences (Post Calculus)—Graphical and mathematical descriptions of data, exploring relationships in data using correlation and classification, designing experiments and surveys for data collection, probability and sampling, statistical inference based on linear regression models, prediction for regression models. Prerequisite: Mathematics 41 or equivalent. GER:2c (DR:4)
3-5 units, Aut (Switzer)
Spr (Liu)

OFFERING LISTS

COMPARATIVE POLITICAL AND HISTORICAL ANALYSIS

131. Globalization and Organizations—Issues of globalization processes, focusing on links between the two. Organizations serve as the carriers of globalization processes: while expanding their activities worldwide, organizations proliferate social procedures, establish isomorphic structures, and diffuse cultural patterns. Globalization processes encourage the formation of organizations and determine their shape worldwide: political structures (structuring the state and its agencies), international relations (establishing political alliances and trade partnerships), commercial organizations (forming multi-national corporations, local branches, or business partnerships), cultural institutions (structuring entertainment conglomerates and sending "waves" of fashion and tastes worldwide); the features of global organizational expansion (loose coupling and isomorphism), forms of organizational adaptation (or globalization), notions of national sovereignty under conditions of intensifying global organizational expansion, and emerging forms of national and international governance. Studies of global organizational fields (science, rights, environment, development, etc.), combining theoretical, comparative, and case-study pieces.
5 units, Win (Drori)

151. International Law and Global Politics—Seminar on the historical evolution of the legal and normative dimension of the global system, contemporary theoretical perspectives and arguments about the nature and role of law in the global system, and the empirical evidence for and against its relevance and meaningful existence in the conduct of states and other international actors. Student paper examines whether and how international law operates and regulates state and other behavior in particular contemporary domains e.g., human rights, the environment, economic relations, or the resort to the use of deadly force.
5 units, Aut (Angiletta)

191. International Relations Journal
1 unit, Aut, Win, Spr (Goldstein)

192. Global Hot Spots: Understanding Current World Conflicts and International Political Issues—Weekly lecture series surveying the historical background and current context of major issues in international politics today. (AU)
1 unit, Spr (Goldstein)

204. Theoretical Issues in International Policy Studies—War and violent conflict are clearly common in international relations. In realms outside of national security such as economic affairs, human rights, and environmental protection, states often miss obvious and important opportunities to solve problems through cooperation. The factors that make international cooperation possible, examine themes of continuity and change. How the increasing economic, informational, and ecological interdependence of recent years is likely to change and reshape international relations in the future. Understanding these related questions;
using causal analysis to understand other social problems.

5 units, Aut (Mitchell)

215. International Environmental Politics—How do nations address international environmental problems that they cannot adequately manage through domestic unilateral action alone? Some negotiated effective international treaties; others have had few positive effects. Students identify and skeptically evaluate all causal claims regarding environmental problems and develop skills using analysis, counterfactuals, and rigorous empirical evaluation. (WIM)

5 units, Win (Mitchell)

HISTORY

102A. The International System 
5 units, Win (Naimark, Simons)

120C. 20th-Century Russian and Soviet History 
5 units, Aut (Weiner)

148C. Africa in the 20th Century 
5 units, Spr (R. Roberts)

165C. The United States in the 20th Century 
5 units, Spr (Kennedy)

172A. The United States since 1945—(Fulfills the American Foreign Policy Requirement.)
4-5 units, Win (Bernstein)

180. 20th-Century Brazil 
5 units, Spr (Wirth)

187B. The Middle East in the 20th Century 
5 units, Win (Beinin)

194D. East Asia in the Age of Imperialism 
5 units, Win (Oksenberg, Duus)

129M. Contemporary East Asia 
5 units, Spr (Oksenberg)

134A. Strategy, War, and Politics—(Fulfills American Foreign Policy requirement.)
5 units, Spr (Sagan)

137F. Nationalism and International Conflict 
5 units (Fearon) not given 2000-01

5 units, Win (Blacker, May, Perry, Sagan)

138B. International Negotiation 
5 units, Spr (O’Neill)

139A. Japanese Foreign Policy 
5 units, Aut (Okimoto)

139B. Seminar: Foreign Policy Decision-Making 
5 units (O’Neill) not given 2000-01

143F. Explaining Ethnic Violence 
5 units, Win (Fearon)

143S. Major Issues in International Conflict Management 
5 units, Win (Stedman)

217. Seminar: Russia in Transition 
5 units, Win (McFaul)

221K. Seminar: Comparative Democratization—Latin America and Other Regions 
5 units, Win (Karl)

227D. Seminar: Consolidating Democracy 
5 units, Spr (Diamond)

241B. Seminar: Decision Making in U.S. Foreign Policy 
5 units, Spr (Blacker)

243B. Seminar: Theoretical Issues in International Security 
5 units, Win (Sagan)

245R. Seminar: The Transformation of Europe 
5 units, Spr (Rice)

COMPARATIVE CULTURE AND SOCIETY

129. International Health Policy: Comparative National Health Care Systems—The structure and underlying policies of national health care systems in Europe, N. America, and Japan. How other countries have addressed issues of health care organization and finance and the issue of allocating scarce health care resources. Limited enrollment. Prerequisite: consent of instructor. 
3 units, Win (Lee)
ANTHROPOLOGICAL SCIENCES
125A. 20th-Century Chinese Societies
5 units, Spr (Gates, Wolf)

ASIAN LANGUAGES
51/151. Japanese Business Culture
3 units, Win (Dasher)

CULTURAL AND SOCIAL ANTHROPOLOGY
77. Japanese Society and Culture
5 units, Aut (Inoue)

87. Social Change in Contemporary China: Remaking the Middle Kingdom
5 units, Win (Kohrman)

87A. Human Rights: Anthropological Perspectives
5 units, Spr (Davis)

134A. Anthropology of Development
5 units, Spr (DeHart de Galicia, Sharma)

ECONOMICS
143. Ethics in Economics: Equity, Efficiency, and Rights
5 units, Win (Hammond)

HISTORY
136B. European Thought and Culture in the 20th Century
5 units (Robinson) not given 2000-01

186A. Modern South Asia: History, Society, Cultures
5 units, Win (Mancall, Pandya)

201. Undergraduate Colloquium: Varieties of Islamic Revival since 1870
5 units, Spr (Simons)

249D. Undergraduate Colloquium: African Cultural History in the 20th Century
5 units, Win (Jackson)

286. Undergraduate Colloquium: Economic and Social History of the Modern Middle East
5 units, Spr (Beinin)

SOCIOLOGY
113. Institutional Theories of Nation-States and Other Organizations
5 units, Spr (Meyer)

117A. China under Mao
5 units, Aut (Walder)

COMPARATIVE INTERNATIONAL POLITICAL ECONOMY
130. Science, Technology and Development—(Enroll in International Policy Studies 230.)
5 units, Aut (Drori)

134. Global Environmental Policy and Law—Advanced seminar on the international management of regional and global environmental issues, focusing on the issues themselves, and on the international institutions and agreements created to manage them. The need for international environmental law, its sources, and the participants in its creation and implementation. What works in international environmental management and what does not. Topics: ozone depletion, global warming, forests, transboundary and marine waters, Antarctica, endangered species, biodiversity, plant genetic resources, trade and the environment, and the rights of indigenous people. The future of global environmental policy and law.
5 units, Aut (Rosencranz)

137. South Asia: Environment, Development, and Security—Parallel movements and activities in these three areas in India and Pakistan since independence in 1947, with emphasis on developments since 1991. The environment: air, water, agrochemical pollution, and population growth, and attempts to limit them. New programs for economic and energy growth and their environmental consequences. The nuclear arms competition between the two countries and its potential to destabilize the region.
5 units, Spr (Rosencranz)

146. The Economics of Regional Agreements—Intended primarily for International Relations and Economics majors and for International Policy Studies graduate students. The economic analysis and political economy of regional trade agreements, and the implications of the movement toward economic and political integration in the post-war period. The nature of European integration is compared and contrasted with that found in the Americas and in Africa. The nature of the challenge to the multilateral trade system, and the relationship between economic integration and domestic policy reform. Traditional free trade areas and customs unions are contrasted with broader negotiating frameworks, e.g., APEC, and network agreements, e.g., FTAA.
5 units, Aut (Josling)

160. Comparative West European Institutions—(Same as Political Science 120A, Public Policy 160.) How institutions shape politics and policies in Western Europe. Electoral laws, parliamentary systems, and government institutions at the national level influence the quality and nature of representation, political competition, and policy outcomes. Institutional developments at the subnational level and within the European Union challenge the domestic politics and policies of the European nation states.
5 units, Aut (Alter)
161. Comparative Political Economy of Post-Socialist Transitions—
(Same as Political Science 121A, Public Policy 161.) The post-Socialist
economic and political transitions ongoing in Eastern Europe and the
former Soviet Union, investigating attempts to build market economies
democratic governments. The politics of constitutional choice and
variation in reform strategies and outcomes across the cases. Prerequi-
sites: Economics 1, Political Science 1 or 10.
5 units, Aut (Alter)

199T. Seminar: Transatlantic Economic Relations—For Internation-
Al Relations and International Policy Studies students. Focus is on the
nature of the transatlantic economic relationship as it has developed in
the past 50 years, and the links between economic, political, and security
dimensions; the U.S. support for European reconstruction, and the process of
economic integration; the collective management of international trade
and monetary regimes; the current trade frictions that strain transatlantic
relationships; and the institutional devices proposed for improving these
relationships. (WIM)
5 units, Spr (Josling)

205. European Integration—(Same as Political Science 219A, Public
Policy 205.) Seminar on the political and economic factors shaping
European integration from its conception to the present day. The evolution
of the European Union and its governing institutions through the lens
of several policy areas. Agricultural, regional, monetary, regulatory, and
foreign policy. The debates about democratic accountability, the future
of the European Union, and the interplay between EU institutions and the
domestic political arenas of the member states. Prerequisites: Economics
1, Political Science 1 or 10, or consent of instructor.
5 units, Win (Alter)

106. The World Food Economy
5 units, Win (Falcon, Naylor)

111. Money and Banking
5 units, Win (Kumhof)
Spr (Cukierman)

113. Technology and Economic Change
5 units, not given 2000-01

115. European Economic History
5 units, Aut (Greif)

118. The Economics of Development
5 units, Aut (Chun)

120. Socialist Economies in Transition
5 units, Aut (Earle)

121. Development Economics, with Special Reference to East Asia
5 units, Spr (Lau)

124. The Economy of Japan
5 units, not given 2000-01

150. Economics and Public Policy—(Same as Public Policy 104.)
5 units, Win (Noll)

155. Environmental Economics and Policy
5 units, Spr (Goulder)

162. Monetary Economics
5 units, Aut (Paal)

165. International Economics
5 units, Win (Kumhof)
Spr (Razin)

169. International Financial Markets and Monetary Institutions
5 units, Spr (McKinnon)

HUMAN BIOLOGY

143. Globalization, Labor, and the Environment
4 units, Win (Rosencranz)

POLITICAL SCIENCE

113A. Politics and Development in Latin America
5 units, Win (Packenham)

125. The Rise of Industrial Asia
5 units, Aut (Oi, Okimoto, Oksenberg, Rohlen, Rowen)

127. Political Economy of Western Europe
5 units, Spr (Mares)

134B. America and the World Economy—(Fulfills American Foreign
Policy requirement.) (WIM)
5 units, Win (Goldstein)

213P. Seminar: Economic Reform and Development in Latin America
5 units, Spr (Packenham)

223M. Seminar: Political Economy of Post-Communism
5 units, Spr (McPaul)

224. Seminar: States and Markets in Development
5 units (Packenham) not given 2000-01

226. Seminar: The Politics of Welfare State Expansion and Reform
5 units, Win (Mares)

241. Seminar: Issues in International Political Economy
5 units, Win (Goldstein)

PUBLIC POLICY

175. Economic Development in Latin America since 1980
3 units, Win (Gonzalez)

INDEPENDENT STUDY/HONORS

Students must obtain section numbers for courses 197 and 198A,B,C
from the International Relations office before enrolling.

197. Directed Study in International Relations
3-5 units, any quarter (Staff)

198A,B,C. Senior Thesis I, II, III—Open only to declared International
Relations majors with approved senior thesis proposals.
3-7 units, any quarter (Staff)

198H. Honors Thesis Colloquium—Open to International Relations
majors in the honors program, and other majors, with approval of
instructor.
2 units, Aut, Win, Spr (Goldstein)

OVERSEAS STUDIES

These courses are approved for the International Relations major and
taught at the campus indicated. Students should discuss with their major
advisers which courses would best meet educational needs. Course de-
scriptions can be found in the “Overseas Studies” section of this bulletin
or in the Overseas Studies Program office, 126 Sweet Hall.
For information on Track designations, consult the updated Course
Offering Lists available in the International Relations office, the Over-
seas Studies Bulletin, and the quarterly University Time Schedule.
BERLIN

The German Economy in the Age of Globalization—(Enroll in Economics 161X.)
units to be arranged, Win (Klein)

Culture and Politics in Modern Germany—(Enroll in German Studies 177A.)
4-5 units, Win (Kramer)

The Second World War in Berlin—(Enroll in History 227V.)
4-5 units, Aut (Sheehan)

War and Peace in the 20th Century—(Enroll in History 228V.)
4-5 units, Aut (Sheehan)

The German Economy: Past and Present—(Enroll in Overseas Studies 115X.)
4-5 units, Aut (Klein)

Multiculturalism in Comparative Perspective: Germany and Israel—(Enroll in Overseas Studies 145.)
4 units, Win (Tempel)

The European Union, Superpower in the Making?—(Enroll in Political Science 114X.)
4-5 units, Win (Brückner)

A People’s Union? Money, Markets, and Identity in the EU—(Enroll in Political Science 126X.)
4-5 units, Aut (Brückner)

BUENOS AIRES

Themes in the Political Economy of Argentina—(Enroll in Economics 162X.)
5 units, Spr (Canitrot)

Argentina’s Foreign Policy—(Enroll in Overseas Studies 2.)
5 units, Spr (Russell)

Politics and Society in Argentina in the 19th and 20th Centuries—(Enroll in Overseas Studies 4.)
5 units, Spr (Gallo)

Contemporary Argentine Political History—(Enroll in Political Science 113X.)
5 units, Spr (Berenzstein)

Seminar on Culture, City, and Politics in Argentina in the 19th and 20th Centuries—(Enroll in Political Science 168X.)
5 units, Spr (Shmidt)

FLORENCE

Italy: Crisis, Change, and Choice—(Enroll in Overseas Studies 120X.)
5 units, Win (Morlino)

The Integration of Europe—(Enroll in Overseas Studies 178F.)
4-5 units, Aut (Spinò)

European Union and Southern Europe: The Challenge of Europeanization—(Same as Political Science 123X.)
units to be announced, Spr (Morlino)

KYOTO

The Political Economy of Japan—(Enroll in Political Science 215X.)
4-5 units, Spr (Kume)

MOSCOW

Economic Reform and Economic Policy in Modern Russia—(Enroll in Economics 120X.)
5 units, Aut (Mau)

War and Women in Russia in the 20th Century—(Enroll in History 218V.)
4 units, Aut (Jolluck)

Stalinism, High Stalinism, and the Cold War in Moscow—(Enroll in History 224V.)
5 units, Aut (Naimark)

Russian Politics—(Enroll in Political Science 120X.)
5 units, Aut (Bratersky)

Contemporary Issues of Russian Society—(Enroll in Political Science 146X.)
4 units, Win (Bratersky)

OXFORD

Path Dependence of Science and Technology since the Industrial Revolution—(Enroll in Economics 168X.)
5 units, Spr (David)

European Imperialism and the Third World, 1870-1970—(Enroll in History 141V.)
5 units, Spr (Darwin)

Changing Health Care Delivery in Britain—(Enroll in Human Biology 160.)
4 units, Win (Birch)

Modern British Politics and Government—(Enroll in Overseas Studies 111X.)
4-5 units, Aut (Wood)

A New Europe: Conflict and Integration since 1980—(Enroll in Political Science 127X.)
4-5 units, Win (Wood)

Social Change in Modern Britain—(Enroll in Sociology 117W.)
4-5 units, Aut (Davies)

Globalization, Nationalism, and Education—(Enroll in Sociology 131.)
units to be announced, Win (Ramirez)

PARIS

Britain in the 20th Century—(Enroll in History 145V.)
5 units, Spr (Tyack)

Europe: Integration and Disintegration of States, Politics, and Civil Societies—(Enroll in Overseas Studies 122X.)
4 units, Win (Lazar)

Gender Development and Women’s Human Rights—(Enroll in Political Science 167X.)
units to be announced, Aut (Okin)

Political Attitudes and Behavior in Contemporary France—(Enroll in Political Science 211X.)
4-5 units, Aut (Mayer)

PUEBLA

Competitiveness and Corporate Governance of Latin American Firms—(Enroll in Economics 109X.)
5 units, Win (Castañeda)
**INTRODUCTION TO THE HUMANITIES PROGRAM**

*Program Director: Oriin Robinson*

Introduction to the Humanities offers courses which satisfy a three-quarter General Education Requirement (GER) for first-year students. The purpose of the Area 1 requirement is to build an intellectual foundation in the study of human thought, values, beliefs, creativity, and culture. Introduction to the Humanities courses enhance skills in analysis, reasoning, argumentation, and oral and written expression, thus helping to prepare students for more advanced work in the humanities, and for work in other areas such as the sciences, social sciences, and engineering.

The Area 1 requirement may be satisfied in two different ways:

- Introduction to the Humanities courses (one-quarter introductory courses followed by two-quarter thematic sequences), or
- The Program in Structured Liberal Education (an intensive, three-quarter, residence-based program satisfying the Area 1 requirement, the University writing requirement, and one additional General Education Requirement)

**COURSES**

**INTRODUCTION TO THE HUMANITIES**

Students enrolled in Introduction to the Humanities courses satisfy, in two parts, the Area 1 requirement by pairing a one-quarter introductory course in Autumn Quarter with a two-quarter thematic sequence in Winter and Spring Quarters. The Autumn Quarter introductory courses hone skills in humanistic disciplines through a close reading and critical investigation of a limited number of works as preparation for further work in the humanities and, specifically, for any one of the Winter-Spring sequences.

**AUTUMN**

14. The Good Life—What does it mean to live the “good life?” What must people do in order to fulfill their potential as human beings and assert their difference from other species? What is the highest value, against which are rated all other human values and activities? Reason? Love? Freedom? Originality? Explicitly and implicitly, written texts (be they philosophical or literary in form) reveal prime values and comment on the nature of the good life. The texts read stage a conflict between competing values, values which although equally desirable turn out to be fundamentally incompatible. Through an analysis and discussion of these works, contrasting visions of the good life put forward by each text are explored.

5 units, Aut (Elam, Landy, Rehm)

19. The Self, the Sacred, and the Human Good—The works examined were written across a span of 2,300 years, from very different cultural and historical situations, and in very different forms and genres. Taken together, they create an urgent conversation about the ways in which human beings define their place in this world, and how they attempt to give meaning and dignity to lives subject to every kind of social and personal evil, bodily affliction, and spiritual doubt. In the face of such difficulties, and mortality, how do humans build systems of value, whether based on personal, sacred, or social authority? What is the relationship between these ways of making meaning and establishing standards of virtue and vice? Are they compatible or antithetical? The works studied give various answers, or refuse to answer at all. Their differences give creative tension to an examination of these issues, as they offer unique aesthetic and persuasive achievements.

5 units, Aut (Wolff, Yearley)

40. Conversions, Past and Present—Conversion experiences are a staple of Western biographical narratives, especially autobiographies, where the moment of conversion (from one faith to another, from one frame of mind to another, from one understanding of the self to another) is often the crux around which the retelling of a life is centered. In five autobiographical works from different periods, narratives of the self rely, each in its own way, on the experience of conversion as the defining factor in describing in words the events, patterns, and meanings of a life.

5 units, Aut (Harrison, Sheehan)

41. The History of Nature/The Nature of History—Human understanding of environmental problems is thoroughly embedded in human behavior, cultures, and values as they have developed over time. Students think historically about the relations of humans to the natural world; examine boundaries between “natural” and “cultural” and understand how humanists and scientists define this boundary; and explore social solutions to crises in the relations between humans and nature.

5 units, Aut (Kennedy, White)

42. Origins: Contested Identities—Origins are privileged moments in forming personal and social identity. Students engage critically with the narratives of birth or geographical locations that are the staple of Western biographies, and analyze how they influence perspectives on personal identity.

5 units, Aut (Hodder, Shanks)

43. Self-Reflections: The Examined Life—Philosophical, religious and literary texts are explored, in different ways, to define personal and social identity.
standing. The texts take different approaches to serious reflection, and come to different conclusions about the nature of a worthwhile life. In all of them, the path of reflective self-examination opens a way forward in a journey or pilgrimage toward the good, learning something about the kind of self-examination depicted within them, and as a set of tools for helping students start that journey themselves.

5 units, Aut (Anderson, Bobonich, Gelber)

44. Things of Beauty—Students are shown how to actively enjoy different forms of the arts (opera, painting, architecture, literature, and film), and are encouraged to see how familiar forms of communication actually belong to the field of aesthetic experience. The aesthetic experience has changed in time, and historical knowledge can enhance aesthetic appreciation. The approaches are grounded in philosophical reflection about aesthetic experience, and in consideration of individual and social functions served by things of beauty.

5 units, Aut (Gumbrecht, Plebuch)

45. Tradition and Revolution: Rewriting the Classics—The complex interactions between philosophy, history, and literature are examined within distinct generic traditions: drama, political fiction, and epic. Major classical texts are paired with Renaissance works that imitate and adapt each model to answer the needs of a radically different intellectual, historical, and aesthetic environment. Through these juxtapositions, it is shown how the relationship between the three disciplines in the humanities changed over time, with the accompanying transformations in understanding what it means to be human.

5 units, Aut (Evans, McCall)

WINTER-SPRING SEQUENCES

2.3. Great Works: The Hereafter, the Here-and-Now—The sequence explores great texts (religious, philosophical, and literary) that have addressed the hereafter and the here-and-now, comparing different conceptions of the afterlife and the ways that traditions about the afterlife are created and appropriated. How the imagined involvement of the underworld in everyday life is modified, tracing the ways that the presence (or absence) of spirits takes on different meanings and makes different claims on the behavior of the living.

2. 5 units, Win (Harrison, Schnapp)
3. 5 units, Spr (Landy, Schilling)

8A,9A. Myth and Modernity: Culture in Germany—The contrasts and interplays between traditional and modern cultures are explored, raising questions about history, progress, and change. What defines a cultural tradition? How do values change? When does a national past sustain or impinge on the present? These questions are posed with reference to German literary and philosophical writings, visual arts, films, and music. Within this cultural field, the focus is on the impact of modernization on values, expressivity, and community. Students are encouraged to adopt a critical perspective on their own cultures, via close examination of the constellation of ideas and values that contributed to the German legacy, with its proximity of intellectual achievement and political disaster. How did an obsession with “race” overtake Germany? Do all cultures require such myths, or can mythic thinking be overcome?

8A. 5 units, Win (Berman)
9A. 5 units, Spr (Eshel)

21A,B. The Literature of Transformation—This sequence explores the ways in which writers from Ovid to Maxine Hong Kingston have dealt with and described the phenomenon of change in their own lives and in the world around them. The foundational text is Ovid’s Metamorphoses, which surfaces throughout the course in the original version (read in translation) and in various transformations from the medieval through the modern periods.

21A. 5 units, Win (Evans, Middlebrook)
21B. 5 units, Spr (Evans, Middlebrook)

22A.B. Performing the Past—Since 5th-century Athens, urban centers have taken material from their historical and mythical past and reshaped it into a theatrical form that articulates significant issues for their immediate situation. This sequence addresses such cultural remappings by examining a series of plays and related documents in which difference societies revise their past and address their present simultaneously.

22A. 5 units, Win (Fordyce)
22B. 5 units, Spr (Fordyce)

23A,B. Reason, Passion, and Reality—What roles should passion and reason play in human life? Answers to this question cross various boundaries of human difference: gender, race, age, culture, and epoch. Contrasting roles for passion and reason are traced in the context of three traditional philosophical concerns: value and obligation; knowledge, emotion, and understanding; God and reality. These problems are explored through classics of philosophy and drama, poetry, novels, and wisdom literature.

23A. 5 units, Win (Bobonich, Moravcsik)
23B. 5 units, Spr (Anderson, Taylor)

24A.B. Ten Days that Shook the World—Focus is on ten events that “shook the world” in their own times, or owing to their medium and long-range effects (and usually both), or in terms of their emblematic nature for historical processes at work: the destruction of the second Temple of Jerusalem (70 BC); the arrival of Islam in India; the Great Plague in Europe, Asia, and N. Africa (1347-50); the battle of Kosovo (1389); the French Revolution; and the “opening” of Japan by Commodore Perry (1853). The leading themes are ideologies of imperialism, universalism, and globalization (religious, political, and economic), and the processes of empire-building and globalization (and resistance to them). The material begins and ends with “the West” because, for better or worse, “the West” created successful world-uniting imperialism in ideology and fact. The Roman imperium, other formations such as the Muslim commonwealth and the Turkish empire, and through contact, India, Japan, and Africa.

24A. 5 units, Win (Buc)
24B. 5 units, Spr (Rodrique)

26A,B. Democratic Society in Europe and America: Origins, Crises, Dilemmas—The development of the theory and practice of democracy is analyzed in Europe and the U.S. from the 18th century to the present. The technique is comparative: by studying European and American materials in parallel, perspectives are developed on both the universal and the particular elements that have shaped the histories of Europe and N. America in the last two centuries. Where appropriate, comparisons are drawn with developments in Asia, Africa, and Latin America.

26A. 5 units, Win (Kennedy, Lougee)
26B. 5 units, Spr (Kennedy, Roberts)

27A.B. Encounters and Identities—The formation of ideas about individual and collective identities is investigated in Latin America, Western Europe, and the U.S. Some contemporary ideas about identity, including nationalism and national identity; and historical encounters and social transformations linking these areas of the globe. In emphasizing the similarities and differences among ideas of individual and collective identity found in different regions of the world, challenges are presented to assumptions about the origins of human identity.

27A. 5 units, Win (Collier)
27B. 5 units, Spr (Yanagisako)

28A,B. Poetic Justice: Order and Imagination in Russia—This sequence examines the difference between justice and law in the view of 19th- and 20th-century Russian writers, focusing on the notion of “poetic justice”: the artistic representation of order, whether divine, natural, or human. The aim is to heighten awareness of familiar narratives, mythologies, ideas, and images, and at the same time convey a sense of a long-
established national culture with its own dynamic and vision.

32A. 5 units, Win (Safran)
32B. 5 units, Spr (Bulgakowa, Freidin)

31A.B. Ancient Empires—This sequence investigates a decisive place and period in world history: the Mediterranean basin between 800 BC and 400 AD. Great empires (Assyria, Persia, Macedonia, and Rome) were carved out in bloody wars and permanently changed the course of human development. Why these empires arose when and where they did, how they worked, and what was their legacy, balancing their economic, religious, and artistic achievements against their records of genocide, enslavement, and brutal warfare. The evidence surviving from ancient literature and archaeology, tracing the roles of religion, property, and freedom across these centuries, and what they meant for the shape of the world today.

31A. 5 units, Win (Morris)
31B. 5 units, Spr (Trimble)

32A.B. Serious Laughter: Fantasy and Invective in Greece, Rome, and Beyond—Few things are as good at revealing fault-lines, tensions, and taboos in culture as what makes people laugh. This sequence examines the full range of comic, satiric, and invective discourse in Greece and Rome (graffiti, oratorical insults, vase paintings, novels) over a millennium (8th century BC to 2nd century AD) to discover how laughter and related responses functioned in ancient social life. The relationship between ancient modes and modern cultural productions (from drama to political rhetoric). Film, visual art, performance, and literary texts provide objects of study.

32A. 5 units, Win (Martin)
32B. 5 units, Spr (Connolly)

33A.B. Gender and Genre—This sequence focuses on the construction of genre, male and female, in the principal literary and philosophical genres or forms in the ancient and early modern worlds. Emphasis is on the terms of such genres, and connections between specific forms of thought and the encoding of gender. Which genres represent particular assumptions about gender and gender relations? What are the roles of language and images in forming identity, the connections between genres and their intellectual and cultural context, and their modification in later historical periods? What about the absence of certain voices, issues of authority, and power?

33A. 5 units, Win (McCall)
33B. 5 units, Spr (Brooks)

PROGRAM IN STRUCTURED LIBERAL EDUCATION

Track Chair: Mark Mancall (History)

Structured Liberal Education (SLE) offers students an intensive, three-quarter, residence-based learning experience, which simultaneously satisfies the Area 1 requirement, the University writing requirement, and one General Education requirement in the humanities.

SLE encourages students to live a life of ideas in an atmosphere that stresses critical thinking and a tolerance for ambiguity. The residence hall is the informal setting for lectures and small-group discussions. SLE instructors work closely with students and participate in dorm life. SLE enhances the classroom experience with other residence-based educational activities: a weekly film series throughout the year and a student-produced play each quarter.

SLE students receive intensive and individualized writing instruction from a team of instructors and peer writing tutors. See the “Structured Liberal Education” section of this bulletin.

PROGRAM IN JEWISH STUDIES

Program Director: Steven Zipperstein
Faculty Advisory Committee: Zachary Baker (Stanford University Libraries), Joel Beinin (History), Arnold Eisen (Religious Studies), Amir Eshel (German Studies), John Felstiner (English), Charlotte Fonrobert (Religious Studies), Mark Mancall (History), Norman Naimark (History), Jack Rakove (History), Aron Rodrigue (History), David Rosenhan (Law, Psychology), Gabriella Safran (Slavic Languages and Literatures), Peter Stansky (History), Amir Weiner (History), Steven Zipperstein (History)

The interdisciplinary Program in Jewish Studies investigates all aspects of Jewish life in history, literature, language, and culture from biblical times to the present. Courses are offered on the undergraduate and graduate levels in a program complemented by a full range of guest lectures, conferences, and symposia. The program annually sponsors the Donald and Robin Kennedy Undergraduate Award for the best undergraduate essay on any theme in Jewish studies, and it coordinates the annual Dorot Travel Grants for summer study in Israel.

Graduate students enroll in the program through the departments of English, History, or Religious Studies and must meet the requirements of those departments.

UNDERGRADUATE PROGRAMS

INDIVIDUALLY DESIGNED MAJOR

The Individually Designed Major in Jewish Studies permits interested students to focus their attention on the broad field of Jewish Studies and, at the same time, to expand their knowledge of one or another related fields.

Each major should complete at least 60 units, all in courses at or above the 100 level (or their equivalent). A maximum of 15 of these 60 units may be taken on a credit/no credit basis. A maximum of 5 of these 60 units may be taken in individual study or directed reading. Students must present evidence that demonstrates their ability to do independent work and have at least three full quarters of undergraduate work remaining and demonstrate that they have completed coursework in the equivalent of at least two years of university-level Modern Hebrew may apply the 12 units required in this category to more work in one or other categories required by the major, with the approval of their primary adviser. Each major must obtain sponsorship from three faculty members, one of whom is the student’s primary adviser, and from the Director of the Program in Jewish Studies. Details about the written procedures and documents necessary for application for an Individually Designed Major can be obtained at the Undergraduate Advising Center, Sweet Hall, first floor (650) 723-2426.

REQUIREMENTS

The faculty members in Jewish Studies have designed the following structure for the major:

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>History and Society: students must take one course in each of the three periods—biblical and ancient, medieval and modern, and contemporary</td>
<td>15</td>
</tr>
<tr>
<td>Religion: biblical, rabbinic, medieval, modern</td>
<td>15</td>
</tr>
<tr>
<td>Literature: Hebrew, Yiddish, Holocaust, American Jewish</td>
<td>10</td>
</tr>
<tr>
<td>Hebrew Language (second year or beyond): Students who demonstrate by examination that they have completed the equivalent of at least two years of university-level Modern Hebrew may apply the 12 units required in this category to more work in one or other categories required by the major, with the approval of their primary adviser.</td>
<td>12</td>
</tr>
<tr>
<td>Ancillary Courses: ancient history, Medieval history, modern European history, history of philosophy, Islam, Christianity</td>
<td>8-10</td>
</tr>
<tr>
<td>Total number of units required</td>
<td>60-62</td>
</tr>
</tbody>
</table>

Students planning an Individually Designed Major in Jewish Studies are also strongly urged to write an honors thesis. Students interested in majoring in Jewish Studies should discuss this with their adviser(s) when discussing the major itself. Up to 10 honors thesis units may be included in the major.

No course proposed for the major may be counted as fulfilling more than one required category in the proposed major. Transfer credits from other universities must be approved by the appropriate Stanford authorities.

MINORS

The Jewish Studies minor is open to students in any department who wish to enrich their studies through an acquisition of knowledge in Jewi-
ish history, thought, religion, literature, and society. Students must complete their declaration of the minor no later than the last day of the quarter four quarters before degree conferral. For example, a student graduating in June (Spring Quarter) must declare the minor no later than the last day of Spring Quarter of the junior year.

Students must complete six courses for a maximum of 36 units toward the minor. All courses of study should be studied and approved by a Jewish Studies faculty member in the departments of English, History, or Religious Studies, and by the program director. In addition to suggested courses offered through the Program in Comparative Studies in Race and Ethnicity; (2) two courses at the 100 level or above from two of three areas of concentration (history, religious studies, or literature); and (3) one seminar or undergraduate colloquium at the 200 level or above in one area of concentration (history, religious studies, or literature.) No course credited toward the minor requirements must be double counted toward major requirements.

HONORS PROGRAM

The Jewish Studies honors program fosters a sustained examination of the field of Jewish studies for students majoring in any discipline, and it extends its concerns across broad interdisciplinary terrain, with implications beyond the humanities in areas such as psychology, law, business, international relations, medicine, etc. Students may apply for entry, at the latest, by the Autumn Quarter of their junior year, and must have a cumulative grade point average (GPA) of ‘B’ or higher.

Each student is required to take a lower-division 5-unit “Jewish Civilization” survey (History 88/Religious Studies 29) co-taught by a cross-section of the faculty in Jewish Studies from the departments of English, History, and Religious Studies, with the cooperation of faculty in American Studies, Feminist Studies, and Slavic Languages and Literatures. This course is designed to provide honors students and others with a broad grasp of the variety and conflicting approaches to Jewish studies. Students may substitute another course with the approval of the program. In addition, students are required to take two 5-unit courses chosen from offerings in English, History, or Religious Studies. Students are urged to take at least one course in Jewish history from the survey offered in the Department of History (128A,B,C). Jewish studies honors students are required to write an honors thesis during Autumn and Winter quarters of the senior year. Honors seminar supervision is provided by relevant faculty in Jewish Studies. Thesis proposals are submitted to the Faculty Advisory Committee at least one year prior to the intended date of graduation.

COURSES

ENGLISH

164B. Imagining the Holocaust
3-5 units, Spr (Felstiner)

FEMINIST STUDIES

139. Rereading Judaism in Light of Feminism
4-5 units, Spr (Karlin-Neumann)

GERMAN STUDIES

102A. German Words/Jewish Voices
3-5 units, Win (Eshel)

HISTORY

85Q. Stanford Introductory Seminar: Jews and Muslims
5 units, Win (Rodrigue)

188C. Jews in the Modern World
5 units, Aut (Zipperstein)

207/307. Undergraduate/Graduate Colloquium: Jews, Christians, and Muslims—Medieval Spain
5 units, Spr (Miller)

209B/309B. Undergraduate/Graduate Colloquium: Crusaders, Pilgrimages, and Voyages of Discovery—The Expansion of Medieval Europe
4-5 units, Win (Miller)

226/326. Undergraduate/Graduate Colloquium: Modernity, Revolution, and Totalitarianism
5 units, Win (Weiner)

285/385. Undergraduate/Graduate Colloquium: Jewish Biography in the 19th and 20th Centuries
5 units, Win (Zipperstein)

285B. Undergraduate Colloquium: The Bible (“Old Testament”) 4 units, Aut (Mancall)

287/387. Undergraduate/Graduate Colloquium: The Jews of Russia
5 units, Spr (Zipperstein)

288/388. Undergraduate/Graduate Colloquium: Palestine and the Arab-Israeli Conflict
5 units, Aut (Beinin)

384A. Graduate Core Colloquium in Jewish History, 17th-19th Centuries
4-5 units, Aut (Rodrigue)

485A. Graduate Research Seminar in Modern Jewish History
4-5 units, Win, Spr (Rodrigue)

LANGUAGE CENTER

128A,B,C. Beginning Hebrew
4 units, Aut, Win, Spr (Staff)

129A,B,C. Intermediate Hebrew
4 units, Aut, Win, Spr (Staff)

130A,B,C. Advanced/Conversational Hebrew
4 units, Aut, Win, Spr (Staff)

141A,B,C. Beginning Yiddish
4 units, Aut, Win, Spr (Szabo)

142A,B,C. Intermediate Yiddish
4 units, Aut, Win, Spr (Szabo)

RELIGIOUS STUDIES

4N. Stanford Introductory Seminar: The Creation of Woman—Eve, Pandora, and their Interpreters
3 units, Win (Fonrobert)

80. Introduction to Rabbinic Culture
4 units, Win (Fonrobert)

121. Peoples of the Book: Prophecy and Martyrdom in Judaism, Christianity, and Islam
5 units, Win (Gregg, Moosa)
134. The Hebrew Bible and Its Early Interpreters  
5 units, Aut (Fonrobert)

161. Modern Jewish Thought: Political-Theological Engagements  
5 units, Spr (Kaplan)

226. Orthodoxy and Heresy in Classical Judaism  
4 units, Aut (Fonrobert)

240. Jews, Pagans, and Christians in Late Antiquity  
4 units, Spr (Gregg)

270. Science and Religion: Biology and Judaism  
4 units, Aut (Bergman, Eisen)

SLAVIC LANGUAGES AND LITERATURES  
105A/205A. Russian Jewish Music  
5 units, Spr (Zemtsovsky)

163. Beyond Fiddler on the Roof: The Jewish Experience in Eastern Europe through Literature and Film  
4 units, Aut (Safran)

COMPARATIVE STUDIES IN RACE AND ETHNICITY, PROGRAM IN  
204. Israel/Palestine: Literature, Politics, and Identity  
5 units, Win (Alcalay)

The following course is designated for the Jewish Studies minor under the Program in Comparative Study in Race and Ethnicity:

HISTORY  
65. Introduction to Comparative Studies in Race and Ethnicity  
5 units, Spr (Camarillo)

LANGUAGE CENTER

Director: Elizabeth Bernhardt  
Assistant Director: Patricia de Castries  
Senior Lecturer, and Coordinator African and Middle Eastern Languages: Khalil Barhoum (Arabic Language and Literature)  
Lecturer, and Coordinator Special Language Program: Eva Prionas (Modern Greek Language and Literature)

The Stanford Language Center was created to oversee all language instruction at Stanford and is principally responsible for all first-and second-year foreign language courses taught at Stanford. The center’s charge is to guarantee that Stanford language programs are of the highest quality; to develop and administer achievement and proficiency tests needed to implement the language requirement; to provide technical assistance and support to the graduate students, lecturers, and faculty who deliver Stanford’s language instruction; and to take leadership in research and development efforts in language learning.

UNDERGRADUATE PROGRAM

MINOR IN MIDDLE EASTERN LANGUAGES, LITERATURES, AND CULTURES

The undergraduate minor in Middle Eastern Languages, Literatures, and Cultures has been designed to give students majoring in other departments an opportunity to gain a substantial introduction to the Arabic and Hebrew languages, as well as an introduction to the cultures and civilizations of the Middle East.

Students declaring a minor must do so no later than the last day of the fourth quarter before degree conferral. For example, students graduating in June (Spring Quarter) must declare the minor no later than the last day of Spring Quarter of their junior year. If a student is not able to meet this deadline, he or she may petition the Language Center director and request a revised declaration date, which may be granted at the director’s discretion.

The requirements for a minor in Middle Eastern Languages, Literatures, and Cultures are:

1. Completion of six courses in either Track A, Cultural Studies, or Track B, Language Studies.
2. Courses for the minor must be taken for a letter grade unless only offered for faculty-elected satisfactory/no credit.
3. All courses must be completed with a letter grade of ‘C’ or better.
4. Courses may not overlap with those taken for a major course of study.
5. Courses taken which also fulfill a GER count toward fulfilling both minor and GER requirements.
6. Students pursuing Track B, Language Studies, must complete the prerequisite of Beginning Arabic or Hebrew, or demonstrate equivalent competence.

CULTURAL STUDIES TRACK

Requirements are:

1. Successful completion of the prerequisite, Beginning Arabic (or Hebrew), or a demonstrated equivalent competence.
2. Completion of three of the Special Language Program (SLP) courses from Appendix A.
3. Completion of three courses from Appendix B.

Course No. and Subject:  
Units

Appendix A:  
125A. The Contemporary Arab World through Literature and Culture  
4 units, Win (Safran)

125B. Readings in Contemporary Arab Writers  
4 units, Win (Safran)

125C. Influences and Issues in Contemporary Arab Women Writers*  
4 units, Win (Safran)

125D. The Arab World through Travel Literature*  
4 units, Win (Safran)

Appendix B:  
Comp. Lit. 10N. Stanford Introductory Seminar: Egyptian East/Egyptian West  
3 units, Win (Safran)

History 85Q. Stanford Introductory Seminar: Jews and Muslims  
5 units, Win (Safran)

History 87. Empires and Cultures in the Modern World  
5 units, Win (Safran)

History 185. Introduction to Islamic Civilization  
5 units, Win (Safran)

History 187B. The Middle East in the 20th Century*  
5 units, Win (Safran)

History 187. Palestine, Zionism, and the Arab-Israeli Conflict  
5 units, Win (Safran)

History 187C. Women in the Modern Middle East  
5 units, Win (Safran)

History 189A. Israel: 1800 to the Present  
5 units, Win (Safran)

History 207. Jews, Christians, and Muslims: Medieval Spain  
5 units, Win (Safran)

History 209A. Law, Society, and Identity in Christianity and Islam, 500-1500  
5 units, Win (Safran)

History 285A. Problems in Israeli History: The National Identity and Political Culture of the Israeli State  
5 units, Win (Safran)

History 285B. Zionist Theory and Practice  
5 units, Win (Safran)

History 285. Undergraduate Colloquium: Economic and Social History of the Modern Middle East  
5 units, Win (Safran)

History 287. Topics in the Modern History of Egypt, Palestine, and Israel  
5 units, Win (Safran)

History 288. Palestine and the Arab-Israeli Conflict  
4-5 units, Win (Safran)

Relig. Studies 121. People of the Book: Abraham and Joseph  
4-5 units, Win (Safran)

* Units of course work earned from GER courses listed in the Language track and Cultural Studies tracks may be used to fulfill the unit requirements for the minor.

LANGUAGE TRACK

Requirements are:

1. Successful completion of the prerequisite, Beginning Arabic (or Hebrew), or a demonstrated equivalent competence.
2. Completion of one year of language study at the intermediate level (SLP 121A,B,C for Arabic, or 129A,B,C for Hebrew).
3. Completion of three courses from Appendix B.

GRADUATE PROGRAM

Ph.D. MINOR IN APPLIED LINGUISTICS

The Ph.D. minor in Applied Linguistics has been designed to give students the opportunity to examine and explore language as it pertains to teaching, learning, translation, education, and language policies.

The Ph.D. minor requires the completion of no less than 30 units of unduplicated course work. Course work must include Linguistics 201
(Foundations of Linguistic Analysis, 4 units). At least one additional Linguistics course must also be taken. Courses taken for the minor must be incremental units beyond those used to satisfy the major (with the exception of Linguistics 201 for Linguistics students). At least 20 of the 30 units must be at the 200 level or above. Students may also supplement their Applied Linguistics training with an array of courses from the departments of Cultural and Social Anthropology, Linguistics, and Spanish and Portuguese.

Overlapping applied linguistics concentrations are available in Learning, Teaching, and Translation of Second Languages; and in Educational and Policy Applications of Linguistics.

Some suggested courses relevant to each track are listed below the track description; a more complete listing of courses which are appropriate for the minor can be found on the Language Center's web site (http://language.stanford.edu/).

Students in either track should develop a program of study in consultation with an academic adviser and submit the proposed program of study for approval by the Applied Linguistics Steering Committee.

THE LEARNING, TEACHING, AND TRANSLATION OF SECOND LANGUAGES TRACK

This overall program concentration requires general reading in second language acquisition (SLA) and/or translation while offering students course work in the following areas:
1. Second language acquisition in instructed contexts
2. Elements of curricular design for university and college settings
3. The acquisition of second language literacy
4. The use of technology to enhance student performance
5. Linguistics and the teaching of foreign languages
6. Theoretical foundations in the translation of various languages

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ed. 248. Theory and Issues in Literacy</td>
<td>4</td>
</tr>
<tr>
<td>Ed. 390. Advanced Seminar in Bilingual Education</td>
<td>1-3</td>
</tr>
<tr>
<td>Lang. Ctr. 201. The Learning and Teaching of Second Languages</td>
<td>3</td>
</tr>
<tr>
<td>Lang. Ctr. 203. Second Language/Second Dialect Acquisition (same as Span. 204)</td>
<td>3-5</td>
</tr>
<tr>
<td>Lang. Ctr. 204. Issues and Methods in the Teaching of Heritage Languages (same as Span. 300)</td>
<td>3-5</td>
</tr>
<tr>
<td>Lang. Ctr. 205. Educational Applications of Sociolinguistics (same as Ed. 341)</td>
<td>3-4</td>
</tr>
<tr>
<td>Ling. 189/289. Linguistics and the Teaching of English as a Foreign Language (same as Ed. 282)</td>
<td>4-5</td>
</tr>
<tr>
<td>Ling. 140/240. Language Acquisition I</td>
<td>4</td>
</tr>
</tbody>
</table>

EDUCATIONAL AND POLICY APPLICATIONS OF LINGUISTICS TRACK

This concentration is oriented toward a combination of conceptual and research foci regarding language minority populations and their educational welfare. The education of women, low-income, and language minority populations receive primary attention within this concentration.

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ed. 248. Theory and Issues in Literacy</td>
<td>4</td>
</tr>
<tr>
<td>Ed. 249. Theory and Issues in the Study of Bilingualism</td>
<td>3-4</td>
</tr>
<tr>
<td>Ed. 270. African-American English in Educational Context</td>
<td>3-4</td>
</tr>
<tr>
<td>Ed. 277X. Education of Immigrants in Cities</td>
<td>4</td>
</tr>
<tr>
<td>Ed. 289X. Introduction to Linguistics for Educational Research (same as Ling. 200)</td>
<td>4</td>
</tr>
<tr>
<td>Ed. 297X. Research in Second Language Classrooms</td>
<td>3</td>
</tr>
<tr>
<td>Ed. 335X. Language Policy and Planning: National and International Perspectives</td>
<td>3</td>
</tr>
<tr>
<td>Ed. 390. Advanced Seminar in Bilingual Education</td>
<td>1-3</td>
</tr>
<tr>
<td>Ed. 435X. Research Seminar in Applied Linguistics</td>
<td>2-4</td>
</tr>
<tr>
<td>Ling. 73/273. African American Vernacular English</td>
<td>4</td>
</tr>
<tr>
<td>Ling. 150. Introduction to Language in Society</td>
<td>6</td>
</tr>
<tr>
<td>Ling. 159. Language and Youth Culture</td>
<td>4</td>
</tr>
<tr>
<td>Ling. 250. Sociolinguistic Theory and Analysis</td>
<td>4-6</td>
</tr>
</tbody>
</table>

COURSES

200. The Teaching of Second Language Literatures—(Same as German Studies 200.) Focus is on literacy development in a second language, emphasizing literacy texts, and assessing the learners' second-language linguistic level and requisite background knowledge with regard to particular literary texts. Instructional strategies and feedback techniques for written and oral work.
3-5 units, Spr (Bernhardt)

201. The Learning and Teaching of Second Languages—The teaching of second languages from a learning perspective, eschewing the traditional sense of “teaching methods.” Focus is on instructional decision-making within the context of the students’ intellectual and linguistic development. Language instructors are prepared to teach languages in a variety of university settings to an array of populations. Some general reading in second language acquisition (SLA) and language-specific reading within the database in SLA.
3-5 units, Spr (Bernhardt)

2-4 units, Spr (Staff)

204. Issues and Methods in the Teaching of Heritage Languages—Focus is on the teaching of Spanish as a heritage language to students raised in Spanish-speaking homes. The fundamental issues relating to the language abilities of heritage students, including aspects of language variation in the Spanish-speaking world, characteristics of English/Spanish bilingualism in the U.S., and the process of second dialect acquisition. Emphasis is on the methods and techniques for developing the academic Spanish language skills of heritage-background students in a classroom setting.
3-5 units (Valdes) not given 2000-01

AFRICAN AND MIDDLE EASTERN LANGUAGES AND LITERATURES (AME)

AFRICAN LANGUAGES

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>100A,B,C. Beginning Amharic</td>
<td>3 units, Win (Staff)</td>
</tr>
<tr>
<td>100B. 3 units, Win (Staff)</td>
<td></td>
</tr>
<tr>
<td>100C. 3 units, Spr (Staff)</td>
<td></td>
</tr>
<tr>
<td>102A,B,C. Beginning Hausa</td>
<td></td>
</tr>
<tr>
<td>102A. 3 units, Spr (Staff )</td>
<td></td>
</tr>
<tr>
<td>102B. 3 units, Win (Staff)</td>
<td></td>
</tr>
<tr>
<td>102C. 3 units, Spr (Staff)</td>
<td></td>
</tr>
<tr>
<td>106A,B,C. Beginning Swahili—Successful completion of 106C may fulfill the foreign language requirement.</td>
<td></td>
</tr>
<tr>
<td>106A. 4 units, Win (Staff)</td>
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</tr>
<tr>
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<tr>
<td>106C. 4 units, Spr (Staff)</td>
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</tr>
<tr>
<td>107A,B,C. Intermediate Swahili</td>
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</tr>
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<td>107A. 4 units, Win (Staff)</td>
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</tr>
<tr>
<td>107B. 4 units, Win (Staff)</td>
<td></td>
</tr>
<tr>
<td>107C. 4 units, Spr (Staff)</td>
<td></td>
</tr>
<tr>
<td>108A,B,C. Advanced Swahili</td>
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</tr>
<tr>
<td>108A. 4 units, Win (Staff)</td>
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</tr>
<tr>
<td>108B. 4 units, Win (Staff)</td>
<td></td>
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<td>108C. 4 units, Spr (Staff)</td>
<td></td>
</tr>
<tr>
<td>111A,B,C. Beginning Chichewa</td>
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<td>111A. 3 units, Spr (Staff)</td>
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<tr>
<td>111B. 3 units, Win (Staff)</td>
<td></td>
</tr>
<tr>
<td>111C. 3 units, Spr (Staff)</td>
<td></td>
</tr>
</tbody>
</table>
MIDDLE EASTERN LANGUAGES

120A,B,C. Beginning Arabic—Successful completion of 120C may fulfill the foreign language requirement.
120A. 4 units, Aut (Barhoum)
120B. 4 units, Win (Barhoum)
120C. 4 units, Spr (Barhoum)

121A,B,C. Intermediate Arabic
121A. 4 units, Aut (Salti)
121B. 4 units, Win (Salti)
121C. 4 units, Spr (Salti)

122A,B,C. Advanced Arabic
122A. 4 units, Aut (Salti)
122B. 4 units, Win (Salti)
122C. 4 units, Spr (Salti)

125A,C,D,E. Topics in Arabic Literature and Culture—Examines several literary and cultural facets of the Arab world not usually dealt with in other courses at Stanford. Designed to be taken independently.
Readings/discussion in English.
125A. The Contemporary Arab World and Culture through Literature—Introduces the Arab world through a survey of different literary genres (i.e., novels, short stories, poetry), providing a glimpse of contemporary Arab society and culture. Readings from prominent authors, dealing with dominant cultural topics, e.g., nationalism, religion, gender and women issues, kinship and social concepts, etc. Texts delineating the cultural uniqueness of the Arab world include major works by Naguib Mahfouz, Nawal El-Saadawi, Ghassan Kanafani, Tayyeb Salih, Etel Adnan, and representative samples of short stories and poetry spanning the Arab world. GER:3a,4a (DR:2 or 7)
4 units, Aut (Barhoum)

125C. Contemporary Arab Women Writers and Issues—Selections of fiction and non-fiction works by prominent Arab women writers, with discussion and analysis of the main cultural factors contributing to the shaping of their dominant feminist conceptions and attitudes. Readings: Fatima Mernissi’s Dreams of Trespass; Nawal El Saadawi’s God Dies by the Nile; Etel Adnan’s Sit Marie Rose; Hanan Al-Shaykh’s The Story of Zaha; Alifa Rifaat’s Distant View of a Minaret; Sahar Khalifeh’s Wild Thorns. Alternates with 625E. GER:3a,4c (DR:7f)
4 units (Barhoum) not given 2000-01

125D. The Arab World through Travel Literature—Western colonialist and postcolonialist portrayals of Arab culture and recent critical examinations of stereotypical depictions of Arabs and Islam. Readings: Gustave Flaubert’s Flaubert in Egypt; Jonathan Raban’s Arabia through the Looking Glass; Elizabeth Fernea’s Guests of the Sheik; Lady Mary Wortley Montagu’s Letters; Lawrence Durrell’s Justine; Edward Said’s Covering Islam and the Introduction to Orientalism; Jack Shaheen’s The T.V. Arab; Maxime Rodinson’s Europe and the Mystique of Islam; Geraldine Brooks’ Nine Hours of Desire; Eric Hansen’s Motoring with Mohammed. GER:3a,4a (DR:2 or 7)
4 units, Spr (Barhoum)

125E. Short Stories and Poetry from the Arab World—Selections of short stories and poetry written by some of the best-known contemporary Arab writers. Discussion and in-depth analysis of representative samples spanning a wide spectrum of the Arab world, e.g., Egypt, Morocco, Tunisia, Sudan, Libya, Yemen, Iraq, Lebanon, Syria, and Palestine. The creative impulses and cultural symbols involved in the interpretation of each work. The stories and poetry illustrate the rich diversity of the Arab world and accentuate the various cultural issues and forces influencing Arab writers. Alternates with 625C. GER:4a (DR:2)
4 units, Win (Barhoum)

128A,B,C. Beginning Hebrew—Successful completion of 128C may fulfill the foreign language requirement.
128A. 4 units, Aut (Staff)
128B. 4 units, Win (Staff)
128C. 4 units, Spr (Staff)

129A,B,C. Intermediate Hebrew
129A. 4 units, Aut (Staff)
129B. 4 units, Win (Staff)
129C. 4 units, Spr (Staff)

130A,B,C. Advanced/Conversational Hebrew
130A. 4 units, Aut (Staff)
130B. 4 units, Win (Staff)
130C. 4 units, Spr (Staff)

141A,B,C. Beginning Yiddish
141A. 4 units, Aut (Szabo)
141B. 4 units, Win (Szabo)
141C. 4 units, Spr (Szabo)

142A,B,C. Intermediate Yiddish
142A. 4 units, Aut (Szabo)
142B. 4 units, Win (Szabo)
142C. 4 units, Spr (Szabo)

SPECIAL LANGUAGE PROGRAM

The Special Language Program (SLP) offers a number of foreign languages not otherwise taught at Stanford. Based on current funding and student requests, the courses planned for 2000-01 are listed below; however, not every course listed will be taught. Additional languages may still be offered upon request, provided funding is available. Requests for the 2001-02 academic year should be made by Spring Quarter of this year at the Special Language Program office.

All beginning-level 3-unit courses are offered on a satisfactory/no credit basis only. Intermediate-level and 4-unit courses are offered with a grading option. No auditors. “Beginning” and “Intermediate” each refer to an academic year’s sequence of language study; the suffixes A, B, and C refer to first-, second-, and third-quarter of language instruction that year. Most 3-unit language courses are offered for a two-year, three-quarter sequence; however, a beginning or intermediate level might be offered on alternate years.

For further information consult the Special Language Program, Building 40, room 41B.

To request a language, apply via the web at http://www.stanford.edu/dept/SLP.

126A,B,C. Beginning Turkish
126A. 3 units, Aut (Ayanoglu)
126B. 3 units, Win (Ayanoglu)
126C. 3 units, Spr (Ayanoglu)

132A,B,C. Beginning Tibetan
132A. 3 units, Aut (Staff)
132B. 3 units, Win (Staff)
132C. 3 units, Spr (Staff)

138A,B,C. Beginning Navajo
138A. 3 units, Aut (Staff)
138B. 3 units, Win (Staff)
138C. 3 units, Spr (Staff)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Units</th>
<th>Component</th>
<th>Notes</th>
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<tr>
<td>144A, B, C</td>
<td>Beginning Tagalog</td>
<td>Gonzalez</td>
<td>3</td>
<td>Aut</td>
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<td>144B</td>
<td>3 units, Win</td>
<td>Gonzalez</td>
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<td>144C</td>
<td>3 units, Spr</td>
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<tr>
<td>146A, B, C</td>
<td>Beginning Persian</td>
<td>Fahimi</td>
<td>3</td>
<td>Aut</td>
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<td>146B</td>
<td>3 units, Win</td>
<td>Fahimi</td>
<td></td>
<td>Win</td>
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<td></td>
<td>Spr</td>
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<tr>
<td>150A, B, C</td>
<td>Beginning Vietnamese</td>
<td>Ha</td>
<td>3</td>
<td>Aut</td>
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<td>3 units, Win</td>
<td>Ha</td>
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</tr>
<tr>
<td>150C</td>
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<td>Ha</td>
<td></td>
<td>Spr</td>
<td>(Ha)</td>
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<tr>
<td>152A, B, C</td>
<td>Beginning Hindi</td>
<td>Singh</td>
<td>3</td>
<td>Aut</td>
<td>(Singh)</td>
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<tr>
<td>152B</td>
<td>3 units, Win</td>
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<td></td>
<td>Win</td>
<td>(Singh)</td>
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<td>Spr</td>
<td>(Singh)</td>
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<tr>
<td>153A, B, C</td>
<td>Intermediate Hindi</td>
<td>Staff</td>
<td>3</td>
<td>Aut</td>
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<tr>
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<td>154A, B, C</td>
<td>Beginning Gujarati</td>
<td>Ranchod</td>
<td>3</td>
<td>Aut</td>
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<td>3 units, Win</td>
<td>Ranchod</td>
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<td>Burke</td>
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<tr>
<td>159A, B, C</td>
<td>Beginning Punjabi</td>
<td>Dhillon</td>
<td>3</td>
<td>Aut</td>
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<tr>
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<td>Dhillon</td>
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<td>Dhillon</td>
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<tr>
<td>162A, B, C</td>
<td>Beginning Tamil</td>
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<td>3</td>
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<td>162B</td>
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<tr>
<td>162C</td>
<td>3 units, Spr</td>
<td>Staff</td>
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<td>Spr</td>
<td>(Staff)</td>
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<tr>
<td>164A, B, C</td>
<td>Beginning Czech</td>
<td>Staff</td>
<td>3</td>
<td>Aut</td>
<td>(Staff)</td>
</tr>
<tr>
<td>164B</td>
<td>3 units, Win</td>
<td>Staff</td>
<td></td>
<td>Win</td>
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<tr>
<td>164C</td>
<td>3 units, Spr</td>
<td>Staff</td>
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<td>Spr</td>
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<tr>
<td>165A, B, C</td>
<td>Intermediate Czech</td>
<td>Staff</td>
<td>3</td>
<td>Aut</td>
<td>(Staff)</td>
</tr>
<tr>
<td>165B</td>
<td>3 units, Win</td>
<td>Staff</td>
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<td>Win</td>
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<tr>
<td>165C</td>
<td>3 units, Spr</td>
<td>Staff</td>
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<td>Spr</td>
<td>(Staff)</td>
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<tr>
<td>167A, B, C</td>
<td>Beginning Polish</td>
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<td>3</td>
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<tr>
<td>167B</td>
<td>3 units, Win</td>
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<tr>
<td>167C</td>
<td>3 units, Spr</td>
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<tr>
<td>168A, B, C</td>
<td>Intermediate Polish</td>
<td>Staff</td>
<td>3</td>
<td>Aut</td>
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<tr>
<td>168B</td>
<td>3 units, Win</td>
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<tr>
<td>168C</td>
<td>3 units, Spr</td>
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<tr>
<td>170A, B, C</td>
<td>Beginning Modern Greek</td>
<td>Prionas</td>
<td>4</td>
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<tr>
<td>170B</td>
<td>4 units, Win</td>
<td>Prionas</td>
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<td>170C</td>
<td>4 units, Spr</td>
<td>Prionas</td>
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<tr>
<td>171A, B, C</td>
<td>Intermediate Modern Greek</td>
<td>Prionas</td>
<td>4</td>
<td>Aut</td>
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<tr>
<td>171B</td>
<td>4 units, Win</td>
<td>Prionas</td>
<td></td>
<td>Win</td>
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</tr>
<tr>
<td>171C</td>
<td>4 units, Spr</td>
<td>Prionas</td>
<td></td>
<td>Spr</td>
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<tr>
<td>172A, B, C</td>
<td>Modern Greek Language and Culture through Literature and Film</td>
<td>Designed to accelerate acquisition of reading, writing, comprehension, and conversation skills through readings of literary texts and films. Grammatical structures, idiomatic expression usage, and vocabulary enrichment are enhanced through complementary, multimedia-based, on-line materials. Alternates with 171A, B, C. 4 units, Aut, Win, Spr (Prionas)</td>
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<tr>
<td>173A, B, C</td>
<td>Beginning Hungarian</td>
<td>Szabo</td>
<td>3</td>
<td>Aut</td>
<td>(Szabo)</td>
</tr>
<tr>
<td>173B</td>
<td>3 units, Win</td>
<td>Szabo</td>
<td></td>
<td>Win</td>
<td>(Szabo)</td>
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</tr>
<tr>
<td>174A, B, C</td>
<td>Beginning Quechua</td>
<td>Fajardo</td>
<td>3</td>
<td>units</td>
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<tr>
<td>174B</td>
<td>3 units (Fajardo)</td>
<td>Fajardo</td>
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<tr>
<td>174C</td>
<td>3 units (Fajardo)</td>
<td>Fajardo</td>
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<tr>
<td>176A, B, C</td>
<td>Beginning Thai</td>
<td>Staff</td>
<td>3</td>
<td>Aut</td>
<td>(Staff)</td>
</tr>
<tr>
<td>176B</td>
<td>3 units, Win</td>
<td>Staff</td>
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<td>Win</td>
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<tr>
<td>176C</td>
<td>3 units, Spr</td>
<td>Staff</td>
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<td>Spr</td>
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</tr>
<tr>
<td>178A, B, C</td>
<td>Beginning Sign (ASL)</td>
<td>Haas</td>
<td>4</td>
<td>units</td>
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</tr>
<tr>
<td>178B</td>
<td>4 units, Win</td>
<td>Haas</td>
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<td>Win</td>
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<tr>
<td>178C</td>
<td>4 units, Spr</td>
<td>Haas</td>
<td></td>
<td>Spr</td>
<td>(Haas)</td>
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<tr>
<td>179A, B, C</td>
<td>Intermediate Sign (ASL)</td>
<td>Haas</td>
<td>3</td>
<td>units</td>
<td>(Haas)</td>
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<tr>
<td>179B</td>
<td>3 units, Win</td>
<td>Haas</td>
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<td>Win</td>
<td>(Haas)</td>
</tr>
<tr>
<td>179C</td>
<td>3 units, Spr</td>
<td>Haas</td>
<td></td>
<td>Spr</td>
<td>(Haas)</td>
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<tr>
<td>183A, B, C</td>
<td>Beginning Sanskrit</td>
<td>Staff</td>
<td>3</td>
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<td>(Staff)</td>
</tr>
<tr>
<td>183B</td>
<td>3 units, Win</td>
<td>Staff</td>
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</tr>
<tr>
<td>183C</td>
<td>3 units, Spr</td>
<td>Staff</td>
<td></td>
<td>Spr</td>
<td>(Staff)</td>
</tr>
<tr>
<td>186A, B, C</td>
<td>Beginning Croatian</td>
<td>Staff</td>
<td>3</td>
<td>units</td>
<td>(Staff)</td>
</tr>
<tr>
<td>186B</td>
<td>3 units, Win</td>
<td>Staff</td>
<td></td>
<td>Win</td>
<td>(Staff)</td>
</tr>
<tr>
<td>186C</td>
<td>3 units, Spr</td>
<td>Staff</td>
<td></td>
<td>Spr</td>
<td>(Staff)</td>
</tr>
<tr>
<td>194A, B, C</td>
<td>Beginning Haitian/Creole</td>
<td>Staff</td>
<td>3</td>
<td>units</td>
<td>(Staff)</td>
</tr>
<tr>
<td>194B</td>
<td>3 units, Win</td>
<td>Staff</td>
<td></td>
<td>Win</td>
<td>(Staff)</td>
</tr>
<tr>
<td>194C</td>
<td>3 units, Spr</td>
<td>Staff</td>
<td></td>
<td>Spr</td>
<td>(Staff)</td>
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<tr>
<td>199Q</td>
<td>Stanford Introductory Seminar: Literature and Culture of Modern Greece</td>
<td>Preference to sophomores. Focus is on modern Greece since its establishment as a nation. Literary works of prominent authors, films, and documents highlight issues related to Greek institutions, social structures, traditions, and culture. Emphasis is on topics of ethnicity,</td>
<td></td>
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</tr>
</tbody>
</table>
CENTER FOR LATIN AMERICAN STUDIES

Chair of the Committee and Director of the Center: Terry Karl
Associate Director: Kathleen B. Morrison
Visiting Professors: Luis Lumbreras, Alejandro Mohar, Alberto Ruiz-Sanchez, Simon Schwartzman

Affiliated Faculty and Staff:
Anthropological Sciences: Clifford Barnett, William Durham, James Fox, John W. Rick
Biological Sciences: David Ackerly, Paul Ehrlich, Harold Mooney
Cultural and Social Anthropology: Akhil Gupta, Renato Rosaldo
Dance: Susan Cashion
Economics: Donald Harris (emeritus), Anne Krueger
Education: Martin Carnoy, Kathleen Morrison, Amado Padilla
History: Zephyr Frank, Stephen Haber, John D. Wirth
Law, School of: John Barton, Thomas Heller
Linguistics: Shirley B. Heath, John Rickford
Medicine, School of: Yvonne Maldonado, Julie Parsonnet, Gary Schoolnik, Peter M. Small
Political Science: Terry Karl, Beatriz Magaloni, Robert Packenham
Religious Studies: Rudy Busto
Spanish and Portuguese: Claire Fox, Mary Pratt, Richard Rosa, Jorge Ruffinelli, Lucia Sá, Guadalupe Valdés, Lyris Wiedmann

The Center for Latin American Studies coordinates the University's teaching, research, and extracurricular activities related to Latin America. Field research, language training, and interdisciplinary approaches are stressed in the Latin American Studies program, which draws on the strength and diversity of its nationally recognized faculty affiliates and substantial library holdings on Latin America. These resources are enhanced by the Tinker Visiting Professorship in Latin American Studies, the principal programs administered by the center (the bachelor's degree, the honors certificate program, summer field research grants, the master's degree, and concurrent degrees with the schools of Business, Education, Law, and Medicine) are described below. For further information, contact the Center for Latin American Studies, Bolivar House, 582 Alvarado Row, Stanford University, Stanford, California 94305-8545; phone (650) 723-4444. Consult the center's Web site for updated information including course offerings and public programs: www.stanford.edu/group/as.

UNDERGRADUATE PROGRAMS
BACHELOR OF ARTS

The A.B. in Latin American Studies (LAS) offers qualified undergraduates the opportunity to pursue an individualized, interdisciplinary study of Latin America, culminating in the preparation of a senior honors thesis written under the guidance of a faculty sponsor, or the completion of an approved service internship and the submission of a satisfactory report that meets program guidelines.

To declare a major in Latin American Studies, a student must apply to the center's Subcommittee on Undergraduate Programs no later than the beginning of the second quarter of the junior year; exceptions are made only in unusual circumstances.

Requirements for the major include the following:
1. Sixty (60) units: no more than 5 units may be taken pass/no credit; at least 40 units must be taken at the 100-level or higher; no more than 20 units completed in overseas study may be applied to the 60-unit requirement. The 60 units must include:
a) 10 units that provide a broad survey of Latin America, for example, LAS 80, 87; History 278; Economics 118; Political Science 113A, 117K; Spanish 160, 161; Overseas Studies (Santiago) 112X, 117X.
b) 30 units devoted to one of the three core concentrations:
1) Culture and Identity of Latin America
2) Political Economy of Latin America
3) Ecology, Environment, and Health in Latin America
The core concentration must include one course in theory and methods (see below), and at least one seminar or colloquium. Twenty units must be taken at the 100-level or higher. For example, students selecting the concentration on Culture and Identity might take Spanish 160; students selecting Political Economy might select Political Science 117K; students selecting Ecology, Environment, and Health might take LAS 195 or Anthropological Sciences 164. A complete list of courses and the core concentrations to which they may be applied is available at the LAS program office.
c) 15 units at the 100-level or higher drawn from the two other core concentrations, with at least 5 units in each.
d) 5 units in the interdisciplinary seminar (LAS 199).
2. Fulfillment of the foreign language requirement (see below). First- or second-year language courses may not be counted toward the 60-unit requirement.
3. Field experience (study abroad, internship, field research) in Latin America.
4. An honors thesis or service internship. Students may enroll in up to 15 units of credit work for the thesis or internship, of which no more than 5 units may be applied to the core concentration or breadth requirement. Prior to the end of the Spring Quarter of the junior year, students who wish to write an honors thesis must present a written proposal with faculty sponsorship to be approved by the Subcommittee on Undergraduate Programs. Only the completion of an honors thesis of substantial quality earns the degree designation of Honors in Latin American Studies. Service internships may be completed at any time prior to the final quarter before graduation and require a substantial report written according to program guidelines and endorsed by the Subcommittee on Undergraduate Programs. Students are strongly advised to seek prior approval for the internship from the LAS program office.

THEORY AND METHODS COURSES

The following courses may be used to satisfy the theory and methods requirement: (recommended for Culture and Identity) Art and Art History 1, Comparative Literature 101, Cultural and Social Anthropology 90, History 80, Spanish 140, (recommended for Political Economy; or Ecology, Environment, and Health) Economics 102A, Political Science 35, Psychology 10, Sociology 180A-B; Statistics 60 or 190; (recommended for Ecology, Environment, and Health) Biological Sciences 141.

FOREIGN LANGUAGE REQUIREMENT

Acquisition of a language of Latin America is critical to an in-depth understanding of the region, both for advanced study and fieldwork and for future professional endeavors. The minimum requirement for completion of the degree or honors certification (see below) is three years of university-level language study, equivalent to advanced proficiency by ACTFL standards.

The foreign language requirement can be satisfied by any of the following: (1) completion of a foreign language class at the third-year level of university training; (2) completion of an upper division (100-level or higher) course taught in the foreign language; or (3) achievement of the Advanced Proficiency level on the ACTFL scale in a test administered by the Department of Spanish and Portuguese. Students entering with advanced proficiency in Spanish are encouraged to enroll in Portug-
The minor in Latin American Studies is offered for students in other majors who wish to develop a complementary concentration on the region. To pursue the minor, students must declare their intention no later than the second quarter of their junior year. The minor must be completed by the second quarter of the senior year. Requirements for the minor include:

1. Completion of 25 units as follows: a 5-unit course surveying Latin America, for example, LAS 80 or an approved substitute; 20 additional units at the 100-level or higher which together comprise a coherent focus on a theoretical problem or issue of the region; for example, culture and identity, political economy, sustainable development. At least 10 of the total 25 units must be completed at Stanford.
2. Demonstration of proficiency in either Spanish or Portuguese, equivalent to the requirement for the major and honors certificate.
3. Field experience in Latin America (study abroad, summer research, internship, and so on) is recommended.

Upon satisfactory completion of all requirements, the center’s Subcommittee on Undergraduate Programs authorizes the designation of the Minor in Latin American Studies on the student’s transcript.

HONORS CERTIFICATION FOR MAJORS IN OTHER DEPARTMENTS OR PROGRAMS

As distinguished from the minor in Latin American Studies, Honors Certification in Latin American Studies is intended to complement study in any conventional major. The aim of certification is to enable the student to pursue a foreign area focus through interdisciplinary course work and individualized research on Latin America, culminating in the preparation of a senior honors thesis written under the guidance of a faculty sponsor.

The Honors Certification program is of particular interest to students who plan further disciplinary study or a career with an international or foreign-area focus. Students in the humanities, social sciences, or natural sciences may wish to enrich their studies by acquiring a first-hand understanding of a related aspect of Latin American life.

To pursue the Honors Certification program, students must apply to the Subcommittee on Undergraduate Programs no later than the Spring Quarter of the junior year, with a written proposal with faculty sponsorship.

REQUIREMENTS

1. Completion of a coherent interdisciplinary program of at least 30 units, based on an individualized plan of study achieved in consultation with the student’s adviser and approved by the center’s Subcommittee on Undergraduate Programs. The curriculum ordinarily includes:
   a) At least one course (5 units) surveying Latin America comprehensively, whether historically from the perspective of a discipline, or in an explicitly interdisciplinary framework. Appropriate courses include, but are not limited to: LAS 80, 87; Economics 118; History 278; Political Science 113A, 117K; Spanish 160, 161; Overseas Studies (Santiago) 112X, 117X.
   b) At least four additional courses (20 units) in 100-level courses or higher, focusing directly on Latin America. First- or second-year language courses may not be counted toward the 25 units. Only 5 units of satisfactory/no-credit work may be counted toward the program.
   c) Five units in the interdisciplinary senior seminar.
   2. Fulfillment of the Foreign Language Requirement (see above).
   3. Field experience in Latin America (study abroad, summer research, internship, and so on).
   4. Submission in the senior year of a research paper of acceptable quality on a topic pre-approved by the Subcommittee on Undergraduate Programs and written under the guidance of a faculty adviser. Up to 15 units may be given for preparation of the senior paper, but no more than 5 of these units may be counted toward the 20 units in 1. Prior to the end of the Spring Quarter of the junior year, students who wish to write an honors thesis must present for approval a written proposal with faculty sponsorship. Only the completion of an honors thesis of substantial quality earns the degree designation of Honors in Latin American Studies.

HONORS COLLEGE

The honors college is offered directly preceding Autumn Quarter for seniors with thesis projects focusing on Latin America. Most will have completed independent field research in Latin America during the summer. The honors college provides workshops to debrief, refocus, and begin the writing process. Ample time is also available for library research, individual faculty consultations, and data analysis. Applications for Honors College are available in the spring prior to the senior year.

SUMMER FIELD RESEARCH

Each summer, the center awards research grants to a small number of undergraduates to conduct individual research projects in Latin America. Students must have demonstrated the ability to work independently and must possess the necessary language competence. Applications must include a research proposal that has been reviewed and endorsed by a faculty member who agrees to serve as sponsor. A pre-fieldwork course, Latin American Studies (LAS) 165, is required the Spring Quarter before departure. Students from all departments are eligible to apply.

GRADUATE PROGRAMS

MASTER OF ARTS

The A.M. in Latin American Studies is designed for students who wish to develop an advanced interdisciplinary area focus prior to the pursuit of: (1) a Ph.D. in one of the disciplines; (2) a professional degree, for example, J.D., M.B.A., M.D.; or (3) a career in business, government, international development, journalism, teaching, or another field in which advanced knowledge of the region is desirable.

Entering A.M. students are expected to possess language proficiency at the minimum of the university-intermediate level in either Spanish or Portuguese, to have completed a course surveying the history of the region as well as training in at least one of the social sciences, and to have field experience (study abroad, extended residence, internship) in Latin America. Applicants must also take the General Test of the Graduate Record Examination (GRE) and have the results sent to Graduate Admissions, Office of the Registrar. Candidates whose native language is not English and who have not studied in an English-speaking institution for at least one and one-half years must take the Test of English as a Foreign Language (TOEFL). The deadline for submission of applications for admission and financial aid is January 1. Admission is normally granted only beginning in Autumn Quarter.

The A.M. is normally completed in one academic year. A total of 45 units is required, distributed as follows:

1. Ten units offered in the Autumn and Winter quarters as the A.M. core seminar (LAS 250 and 251).
2. Twenty units in one of the three core concentrations: Culture and Identity; Political Economy; or Ecology, Environment, and Health. All of the units must be at the 100-level or higher, with no fewer than 10 units at the 200-level or higher.
3. Fifteen units at the 100-level or higher, drawn from an approved list of courses outside the core concentration. No more than 5 of these 15 units may be devoted to individual directed research (LAS 269).

A minimum of 5 units of course work must be devoted to language study. Students who already possess proficiency in Spanish are encouraged to pursue the study of Portuguese or a language indigenous to the region (for example, Quechua, Quiche Maya, Haitian Creole).

All A.M. students are expected to complete a non-credit workshop on bibliographic resources given early in the Autumn Quarter.

455
In addition, at the end of the Spring Quarter students must either: (1) pass a comprehensive written exam, or (2) submit an extended research paper of satisfactory quality. The research option requires approval early in the Winter Quarter, based on the submission of an advanced proposal with faculty sponsorship. No more than 10 of the 45 required units may be devoted to individual directed research (LAS 269), and no more than 5 units of LAS 269 may be applied to the 15-unit breadth requirement of item '3' above.

CONCURRENT DEGREE PROGRAMS

The Center for Latin American Studies collaborates with the schools of Business (M.B.A.), Education (M.A.T.), Law (J.D.), and Medicine (M.D.) to allow students to simultaneously pursue concurrent degrees in LAS (A.M.) and the respective professional field. Students must apply to and be independently admitted to both degree programs. For additional information about specific plans of study and degree requirements, contact the Center for Latin American Studies.

SUMMER FIELD RESEARCH

The center awards summer research grants for continuing graduate students to conduct individual research projects in Latin America. A competition is held each Spring Quarter, and continuing graduate and professional school students in any field and at any level are eligible to apply. Applicants must provide evidence of appropriate language competence and have the sponsorship of a faculty member. For additional information, contact the Center for Latin American Studies.

DOCTOR OF PHILOSOPHY

Although the University does not offer a Ph.D. in Latin American Studies, Stanford has several departmental Ph.D. programs in which a student may concentrate on Latin America. These include Cultural and Social Anthropology, History, Political Science, and Spanish and Portuguese. For admission information, contact the individual departments directly.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

See the respective department section of this bulletin for cross-listed course descriptions.

80/170. Culture, Politics, and Society in Latin America—(Same as History 80.) Introduction to the political and social history of Latin America. Emphasis is on the interaction between institutional change, social structure, and political movements, emphasizing the environment and cultural values. GER 3b, 4a (DR: 2 or 9) (WIM)

5 units, Win (Wirth)

87Q. Stanford Introductory Seminar: Urbanization, Poverty, and Children in Latin America—Preference to sophomores. Regional issues through the study of street children in Latin America: rural-urban migration patterns, the informal economy and labor sector, human rights, ethnicity and identity, the costs of structural adjustment policies, environmental and other health hazards, the role of public and private institutions, and grassroots mobilization. Disciplinary perspectives on the plight of street children include sociological and demographic profiles; psychological studies; depictions in literature, film, and popular culture; ethnographies; and economic analyses. Case studies of institutional responses. Enrollment limited to 10.

5 units, Spr (Morrison)

109/209. Configurations of the State in Peru—The process of formation of the ancient State in the Central Andes and the social conditions that sustained it. The impact and consequences of the implementation of the Spanish colonial project and republican "modernity" in the heart of Andean civil society.

5 units, Win (Lumbraeras)


5 units, Win (Schwartzmann)


5 units, Win (Karl)

120. Chilean Studies: Modern Chilean Culture through Music, Film, and Literature 1945-1997—(Same as Spanish 168E.) Recommended for students planning to attend the Santiago program and open to all students. Introduction to the history, culture, politics, and literature of Chile, mainly in the 20th century.

3-5 units, Spr (Missana)

122A. The Maya—(Enroll in Anthropological Sciences 122.)

5 units (Fox) not given 2000-01

137A. Darwin, Evolution, and Galapagos—(Enroll in Anthropological Sciences 137.)

5 units (Durham) not given 2000-01

142. Incas and their Ancestors: Peruvian Archaeology—(Enroll in Anthropological Sciences 142.)

5 units (Rick) not given 2000-01

161. Conservation and Community Development Issues in the Amazon—(Enroll in Anthropological Sciences 161A.)

5 units, Win (Stronza, Durham)

165. Introduction to the Design and Methodology of Interdisciplinary Field Research—Preparation for summer fieldwork in Latin America or other regions. Issues of interdisciplinary research design and methodology; the relationship between evidence and argument; practicalities of field research in developing countries; ethical and political considerations.

5 units, Spr (Staff)

165A. Human Ecology of the Amazon—(Enroll in Anthropological Sciences 161B.)

5 units (Lu) not given 2000-01

169/269. Directed Individual Study—(Graduate students register for 269.) For students engaged in special interdisciplinary work that cannot be arranged by department.

1-5 units, Aut, Win, Spr (Staff)

192. The Information Revolution in Latin America—Obstacles and Opportunities through the Internet—Multiple disciplines are used to analyze the opportunities and obstacles that the Information Revolution presents for newly developing countries in Latin America. Students develop the framework and tool set for formulating, evaluating, and recommending possible policy changes and courses of action through country case studies. Topics: internet infrastructure issues; technology transfer, human capital formation, and capacity-building; challenges of access and opportunity; government policy and the role of the private sector; strategies for enterprise development. Mandatory weekly section. Limited enrollment.

5 units, Aut (Morrison, Winograd)

198. Senior Thesis—Restricted to undergraduate majors and those writing the honors thesis in Latin American Studies.

1-10 units, Aut, Win, Spr (Staff)
199. Senior Seminar in Latin American Studies—Required for senior majors in LAS and open to seniors writing honors theses related to Latin America.
5 units, Win (Morrison)

249. Design Studio: Case Study, Mexico—Interdisciplinary studio course/internship on actual project near Ensenada, Mexico. Introduces the design process through hands-on experience. Client contact, site visits, examination of relevant social conditions, design development, and architectural history.
3 units, Spr (Staff)

250. Graduate Core Seminar in Latin American Studies: Latin American Cultural Theory—A Historical Perspective—(Same as Spanish 307.) A historical approach to debates on race and identity in Latin America. Analysis of the works of Bello, Alencar, Marti, Freyre, Andrade, Carpenter, Guevara, Boal, Fernandez Retamar, Rama, etc.
5 units, Aut (Sd)

251. Graduate Core Seminar in Latin American Studies: Society and Politics in Latin America—Restricted to A.M. degree students, or consent of instructor. Analysis of social structures and political systems in the main Latin American countries. Review and interpretation of events since the 1920s provide the basis for comparative conclusions.
5 units, Win (Staff)

1 unit, Win (Kollman, R. Roberts)

AFFILIATED DEPARTMENT OFFERINGS

The courses listed below by department deal primarily with Latin America. See the respective department listings for course descriptions and General Education Requirement (GER) information. Additional relevant courses by resident or visiting faculty may be offered; for updated information, consult the quarterly Time Schedule or contact the Center for Latin American Studies for a list of approved courses and their respective core concentration areas.

ANTHROPOLOGICAL SCIENCES

3. Introduction to Prehistoric Archaeology
3-5 units, Aut (Rick)

23N. Stanford Introductory Seminar: Maya Mythology Multimedia Project
3 units, Win (Fox)

111. Language and Prehistory
5 units (Fox) not given 2000-01

115. Maya Hieroglyphic Writing
5 units, Spr (Fox)

141/241. Hunter-Gatherers in Archaeological Perspective
5 units, Win (Rick)

162. Indigenous Peoples and Environmental Problems
3-5 units (Durham) not given 2000-01

163. Community-Based Conservation
5 units (Staff) not given 2000-01

168B. Environmental Justice
5 units, Aut (Lu)

170. Medical Anthropology
5 units, Aut (Barnett)
106. The World Food Economy
5 units, Win (Falcon, Naylor)

118. The Economics of Development
5 units, Aut (Chun)

165. International Economics
5 units, Win (Kumhof)
Spr (Razin)

169. International Financial Markets and Monetary Institutions
5 units, Spr (McKinnon)

214. Microeconomic Issues in Economic Development
5 units, Win (Krueger)

216. The Macroeconomics of Economic Development and Growth
5 units, Spr (Lau)

217. Money and Finance in Economic Development
5 units, Aut (McKinnon)

266. International Trade Theory
5 units, Win (Razin)

267. Special Topics in International Economics
5 units, Spr (A. Krueger)

365A,B,C. Workshop in International Economics
10 units (Staff)

EDUCATION
197. Education and the Status of Women: Comparative Perspective
4-5 units, Win (Wotipka)

202. Introduction to Comparative and International Education
4-5 units, Aut (Mundy)

283. Attitudes toward Languages and Language Study
3 units (Padilla) not given 2000-01

306A. Education and Economic Development
5 units, Win (Carnoy)

306B. The Politics of International Cooperation in Education
3-4 units, Spr (Mundy)

306C. Culture and Technology
4 units, Spr (McDermott)

306D. World, Societal, and Educational Change: Comparative Perspectives
4-5 units, Aut (Ramirez)

335X. Language Policy and Planning: National and International Perspectives
3 units, Spr (Valdés)

376. Education and Theories of the State
5 units (Carnoy) not given 2000-01

387A,B,C. Workshop: Comparative Studies of Educational and Political Systems—(Same as Sociology 311A,B,C.)
387A. 2-5 units, Aut (Ramirez)
387B. 2-5 units, Win (Meyer)
387C. 2-5 units, Spr (Meyer)

408. Research Workshop in International and Comparative Education
2-5 units, Win (Carnoy)

ENGLISH
262. Literatures of the Americas
4-5 units, Aut (D. Jones)

GEOPHYSICS
50Q. Stanford Introductory Seminar: The Coastal Zone Environment
3 units, Aut (Ingle)

HISTORY
80. Culture, Politics, and Society in Latin America
5 units, Win (Wirth)

177. Modern Latin America
5 units (Haber) not given 2000-01

178. Colonial Latin America
5 units, Aut (Frank)

180. 20th-Century Brazil
5 units, Spr (Wirth)

206B/306B. Design and Methodology for International Field Research
1 unit, Win (Kollmann, R. Roberts)

252/352. Undergraduate/Graduate Colloquium: Decision-Making in International Crises—The A-Bomb, the Korean War, and the Cuban Missile Crisis
5 units, Aut (Bernstein)

270S. Undergraduate Research Seminar: North American Wests
5 units, Spr (White)

277. Undergraduate Colloquium: History and Public Policy—The Political Economy of Economic Growth
4-5 units, Aut (Lopez-Alonso)

279. Undergraduate Colloquium: Latin American Development: Economy and Society, 1800-2000
5 units, Win (Frank)

281 A/381 A. Undergraduate/Graduate Colloquium: Environmental History of the Americas
5 units, Spr (Wirth)

281. The Family in Latin America
5 units, Win (Frank)

283/383. Undergraduate/Graduate Colloquium: The Process of Industrialization—Europe, the United States, and Latin America
4-5 units (Haber) not given 2000-01

378. Frontiers, Backlands, and Boundaries in Latin America
5 units, Spr (Frank)

476. Graduate Seminar on Latin America
4-5 units, Aut (Wirth)

HUMAN BIOLOGY
152. Environmental Policies and Institutions in Developing Countries
5 units (Rosencranz) not given 2000-01
167. International Health
3 units, Spr (Wang)

INTERNATIONAL RELATIONS

134. Global Environmental Policy and Law
5 units, Aut (Rosencranz)

146. The Economics of Regional Agreements
5 units, Aut (Josling)

192 Global Hot Spots: Understanding Current World Conflicts and
International Political Issues
1 unit, Spr (Goldstein)

215. International Environmental Politics
5 units, Win (Mitchell)

POLITICAL SCIENCE

24N. Stanford Introductory Seminar: The Politics of Economic
Development
5 units, Spr (Tomz)

25. Colonialism and Nationalism in the Third World
5 units (Abernethy) given 2001-02

35/135. International Politics
5 units, Aut (Michell)

112M. Latin American Politics
5 units (Magaloni) not given 2000-01

113A. Politics and Development in Latin America
5 units, Win (Packenham)

114K. Political Economy of Development
5 units (Karl) not given 2001-02

116L/216L. Comparative Democratic Development
5 units (Diamond) given 2001-02

117K. The Global Politics of Human Rights
5 units, Win (Karl)

132D. Seminar: Controversies over Foreign Aid
5 units (Abernethy) given 2001-02

211M. Seminar: Comparative Party Politics and Elections
5 units (Magaloni) not given 2000-01

212M. Seminar: Comparative Political Institutions
5 units (Magaloni) not given 2000-01

213P. Seminar: Economic Reform and Development in Latin America
5 units, Spr (Packenham)

221K. Seminar: Comparative Democratization—Latin America and
Other Regions
5 units, Win (Karl)

224. Seminar: States and Markets in Development
5 units (Packenham) not given 2000-01

227D. Seminar: Consolidating Democracy
5 units, Spr (Diamond)

228D. Seminar: Non-Governmental Organizations and Develop-
ment in Poor Countries
5 units (Abernethy) given 2001-02

297. Graduate Seminar: The Political Economy of Immigration
5 units (Wong) not given 2000-01

311. Graduate Seminar: Major Theories in Comparative Politics
5 units, Aut (Packenham)

314K. Seminar: Political Economy of Development
5 units (Karl) not given 2000-01

315K. Research in Latin America and Other Regions
5 units, Spr (Karl)

SCIENCE, TECHNOLOGY, AND SOCIETY

279. Technology Policy and Management in Newly-Industrializing
Countries
2-4 units (Forbes) not given 2000-01

SOCIOLOGY

110/210. Politics and Society
5 units, given 2001-02

311A,B,C. Workshop: Comparative Studies of Educational and
Political Systems—(Same as Education 387A,B,C.)
311A. 2-5 units, Aut (Ramirez)
311B. 2-5 units, Win (Meyer)
311C. 2-5 units, Spr (Meyer)

SPANISH AND PORTUGUESE

109A. Practicum: Portuguese for Speakers of Spanish (Part 1)
2-3 units, Aut (Wiedemann)

109B. Practicum: Portuguese for Speakers of Spanish (Part II)
2-3 units, Aut (Wiedemann)

110N. Stanford Introductory Seminar: Introduction to Chicana/o
Literature and Visual Art
3-5 units, Aut (Yarbro-Bejarano)

112N. Stanford Introductory Seminar: The U.S.-Mexico Border
Region in Film and Literature
3-5 units, Spr (Fox)

114N. Stanford Introductory Seminar: Lyric Poetry
3-5 units, Spr (Predmore)

132. Mexican and Chicano Cultural Perspectives
4 units, Win (Gonzalez)

143E. Latinos/as and Popular Culture in the United States
3-5 units, Win (Negron)

161. Latin American Literature
3-5 units, Spr (Ruffinelli)

168E. Chilean Studies: Modern Chilean Culture through Music,
Film, and Literature 1945-1997
3-5 units, Spr (Missana)

172E. Reading the Rain Forest
3-5 units, Aut (Sá)

175Q. Stanford Introductory Seminar: Latin American Heroes and
Heroines in Film and Literature
3-5 units, Win (Ruffinelli)

179E. Teatro America Workshop: The Theater of Native/Chicano
America
5 units, Spr (Moraga)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Semester/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>114X</td>
<td>Modernization and its Discontents: Chilean Politics at the Turn of the Century</td>
<td>5</td>
<td>Win (Heine)</td>
</tr>
<tr>
<td>118X</td>
<td>Cultural Modernization: The Case of Chile</td>
<td>5</td>
<td>Win (Fuenzalida)</td>
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<tr>
<td>120X</td>
<td>Modernization and Culture in Latin America</td>
<td>5</td>
<td>Aut (Subercaseaux)</td>
</tr>
<tr>
<td>129X</td>
<td>Latin America in the International System</td>
<td>5</td>
<td>Win (Rojas)</td>
</tr>
<tr>
<td>130X</td>
<td>Latin American Economies in Transition</td>
<td>5</td>
<td>Aut (Muñoz)</td>
</tr>
<tr>
<td>141X</td>
<td>Politics and Culture in Chile</td>
<td>5</td>
<td>Spr (Subercaseaux)</td>
</tr>
<tr>
<td>15</td>
<td>Research Project</td>
<td>2-3</td>
<td>Win (Staff)</td>
</tr>
<tr>
<td>16</td>
<td>Writing Workshop</td>
<td>2</td>
<td>Win (Staff)</td>
</tr>
<tr>
<td>104X</td>
<td>Cholula: The Workings of a Sacred City</td>
<td>3</td>
<td>Win (Knab)</td>
</tr>
<tr>
<td>105X</td>
<td>Mexico: Explaining Change in an Era of Globalization</td>
<td>5</td>
<td>Win (Morales)</td>
</tr>
<tr>
<td>110X</td>
<td>Urban Politics in Latin America</td>
<td>5</td>
<td>Win (Fraga)</td>
</tr>
<tr>
<td>111</td>
<td>Social Heterogeneity in Latin America</td>
<td>5</td>
<td>Aut (Valdés)</td>
</tr>
<tr>
<td>112X</td>
<td>Urban Cultures in Santiago</td>
<td>5</td>
<td>Win (Fraga)</td>
</tr>
<tr>
<td>116X</td>
<td>Modernization and its Discontents: Chilean Politics at the Turn of the Century</td>
<td>5</td>
<td>Spr (Heine)</td>
</tr>
<tr>
<td>119</td>
<td>Popular Mexican Art</td>
<td>4</td>
<td>Win (Staff)</td>
</tr>
<tr>
<td>307E</td>
<td>Latin American Cultural Theory: A Historical Perspective</td>
<td>3-5</td>
<td>Aut (Sá)</td>
</tr>
<tr>
<td>310E</td>
<td>Life in Megalopolis: Mexico City and São Paulo</td>
<td>3-5</td>
<td>Win (Sá)</td>
</tr>
<tr>
<td>313</td>
<td>The Colonial Condition</td>
<td>3-5</td>
<td>Spr (Gómez)</td>
</tr>
<tr>
<td>327</td>
<td>Literary and Cultural Theories</td>
<td>3-5</td>
<td>Aut (Rios)</td>
</tr>
<tr>
<td>328</td>
<td>Nation(s) and Citizenship(s): Modernity, Postmodernity, and Globalization</td>
<td>3-5</td>
<td>Aut (Rios)</td>
</tr>
<tr>
<td>369</td>
<td>The U.S.-Mexico Border Region</td>
<td>3-5</td>
<td>Win (Fox)</td>
</tr>
<tr>
<td>370</td>
<td>Narratives of Women and Crisis in 1990s Cuba</td>
<td>3-5</td>
<td>Spr (Campuzano)</td>
</tr>
<tr>
<td>380E</td>
<td>Critical Concepts in Chicana/o Literature</td>
<td>3-5</td>
<td>Spr (Yarbro-Bejarano)</td>
</tr>
<tr>
<td>OVERSEAS STUDIES</td>
<td>These courses are approved for the Latin American Studies major and taught at the campus indicated. Students should discuss with their major advisers which courses would best meet educational needs. Course descriptions can be found in the “Overseas Studies” section of this bulletin or in the Overseas Studies Program office, 126 Sweet Hall.</td>
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</tr>
</tbody>
</table>
LINGUISTICS

Emeriti: (Professors) Clara N. Bush, Joseph H. Greenberg
Chair: Stanley Peters
Professors: Joan Bresnan, Eve V. Clark, Penelope Eckert, Shirley Brice Heath, Martin Kay, Paul Kiparsky, William R. Leben, Beth Levin, Stanley Peters, John R. Rickford, Ivan A. Sag, Elizabeth C. Traugott, Thomas A. Wasow (on leave)
Associate Professor: Peter Sells
Assistant Professors: David Beaver, Edward Fleming (on leave), Christopher Manning
Courtesy Professor: John Baugh
Senior Lecturers: Philip L. Hubbard, Beverley J. McChesney
Acting Assistant Professor: Michael Dukes
Consulting Professors: Jerry Hobbs, Ronald Kaplan, Charlotte Linde, Geoffrey Nunberg
Consulting Associate Professors: Jared Bernstein, Mary Dalrymple
Consulting Assistant Professors: Cleo Condoravdi, Hinrich Schuetze
Visiting Professor: Arnold Zwicky
Visiting Assistant Professor: Kira Hall, Henning Reetz (Winter)
Affiliated Faculty: Herbert H. Clark, Kenji Hakuta, James A. Fox, Yoshiko Matsumoto, Mary L. Pratt, Orrin W. Robinson III, Richard D. Schupbach, Chaofen Sun

English for Foreign Students
Director: Beverley J. McChesney
Associate Director: Philip L. Hubbard
Lecturers: Carole Mawson, Constance Rylance

Linguistics concerns itself with the fundamental questions of what language is and how it is related to the other human faculties. In answering these questions, linguists consider language as a cultural, social, and psychological phenomenon and seek to determine what is unique in languages, what is universal, how language is acquired, and how it changes. Linguistics is, therefore, one of the cognitive sciences; it provides a link between the humanities and the social sciences, as well as education, and hearing and speech sciences.

The department offers courses at the undergraduate and graduate levels in the areas central to linguistic theory and analysis. Many of them deal with the analysis of structural patterns in the different components that make up language, including sounds (phonetics and phonology), meanings (semantics), words (morphology), sentences (syntax), and the way they change. Other courses integrate the analysis of linguistic structure with phenomena that directly concern other disciplines. These include courses in computational linguistics, language acquisition, the philosophy of language, and sociolinguistics.

A variety of open forums provide for the discussion of linguistic issues, including colloquia and regularly scheduled workshops in child language, historical linguistics, phonology, semantics, sociolinguistics, and syntax. Faculty and visiting scholars in the Cognitive Science Group and the Center for the Study of Language and Information, whose members are computer scientists, linguists, philosophers, and psychologists, participate extensively in the activities of the department.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The undergraduate major stresses the study of language both as a fundamental human faculty and as a changing social institution. At the core of the program is a set of departmental courses on the nature of human language; the major also draws on courses offered by other departments and programs.

The Linguistics major cuts across the humanities, and the social and physical sciences, and provides a solid general education as a background for advanced studies in such disciplines as anthropology, communication, computer science, education (language, literacy, and culture), hearing and speech sciences, languages, law, linguistics, philosophy, and psychology.

Requirements

Requirements for the A.B. include at least 50 units of course work in linguistics and related fields (typically twelve courses plus Linguistics 197, Undergraduate Research), and a short research paper. No more than twelve of the 50 units may be below 100-level. No more than two courses, neither of which can be a core course, may be taken on a credit/no credit basis.

Core Courses—The core courses are:
110. Introduction to Phonetics and Phonology
120. Introduction to Syntax
130A. Introduction to Linguistic Meaning, or 130B. Introduction to Lexical Semantics
150. Language in Society, which fulfills the writing in the major requirement (WIM)
160. Introduction to Language Change, or, in consultation with their adviser, a course in historical linguistics or the history of a language

All majors must complete at least four core courses, including 150, Language and Society, which fulfills the writing requirement (WIM).

Other Courses—Other courses counting toward the unit requirement should form a coherent program and be approved by an adviser. Students select emphases from among the areas of concentration listed below (or design one in consultation with their adviser). Students should consult with an adviser when declaring the major, and maintain regular contact during the remainder of their Stanford career.

Of the 50 units for the major, at least 16 come from the core courses. If only four core courses are taken, Linguistics 1, Introduction to Linguistics, is required for breadth. Students must also take:
1. At least two 200-level Linguistics courses.
2. Linguistics 197, Undergraduate Research Seminar, in the junior year. (Special arrangements can be made for transfer students and others who start the major late.)

Language Requirement—Majors must have competence in at least one language other than English as part of their understanding of the field of linguistics and its study. This is usually demonstrated by the completion of six quarters of language study at Stanford or equivalent (level of proficiency is determined by the Language Center or the relevant language department).

Research Paper—Students complete a short (10-15 page) primary research paper with a grade of 'B' or better by the end of their junior year (special arrangements can be made for transfer students and others who start the major late). The research paper requirement may be fulfilled in one of the following three ways:
1. Completion of a research paper project in a Linguistics course (for example, 110, Phonetics and Phonology; 124, Introduction to Formal Universal Grammar; 137, Symbolic Systems Seminar; 150, Language in Society; 182, Introduction to Typology), subject to approval of the instructor.
2. Expansion of the pilot research project in a Linguistics course (for example, 140, Language Acquisition; or 197, Undergraduate Research) into a research paper. Typically, students sign up for 1 additional unit of 199, Independent Study, with a faculty adviser.
3. Writing a paper in the context of a 2-3 units independent research course (199, Independent Study).

AREAS OF CONCENTRATION

Students select one of the following areas of concentration or develop one themselves. All areas of concentration should be designed in advance in consultation with an undergraduate adviser in Linguistics. See the department's web pages for details.

General Linguistics (all five core courses required)
Language and Society
Language Specialization
Language Structures

MINORS

Requirements for the minor include at least 28 units of course work (typically seven courses) in linguistics and related fields. The minor consists of:

1. Linguistics 1, Introduction to Linguistics
2. Two out of the following five Linguistics core courses:
   110. Introduction to Phonetics and Phonology
   120. Introduction to Syntax
   130A. Introduction to Linguistic Meaning, or 130B. Introduction to Lexical Semantics
   150. Language in Society
   160. Introduction to Language Change (or, in consultation with their adviser, a course in historical linguistics or the history of a language)
3. At least four other courses. Students are encouraged to take at least one 200-level Linguistics course. Students may also choose to do independent work with a faculty member of their choice.

Students should work out a coherent program in advance in consultation with a Linguistics undergraduate adviser who should ascertain that the courses chosen are offered during the time of anticipated enrollment. The courses counting toward the minor must be incremental units beyond those needed to satisfy the major. They should form a coherent program, and are subject to approval by the Linguistics Undergraduate Studies Committee.

HONORS PROGRAM

Students who wish to undertake a more intensive program of study, including independent research, should seek departmental honors. An application to pursue honors work should be presented to a Linguistics undergraduate adviser before the end of the junior year. Approval is given only to students who have maintained a grade point average (GPA) of 'B+' or better in the courses required for the major.

Honors students take a total of 60 units. These must include the 50 units for the major, 10 additional units, and an honors thesis based on research conducted with a principal adviser who must be a member of the Linguistics faculty, and a secondary faculty adviser, who may, with the approval of the Undergraduate Studies Committee, be a member of another department. In the Autumn Quarter of the senior year, honors students enroll in Linguistics 199, Independent Study, to work closely with one of the advisers on the research project. In Winter and Spring quarters, honors students register in 198, Honors Research, with the principal adviser for close supervision of the honors thesis. The thesis must be submitted in final, acceptable, form by May 15. The thesis topic is presented orally at a department Honors Colloquium late in Spring Quarter.

COTERMINAL A.M.

The Department of Linguistics admits a very limited number of undergraduates to work for their coterminal degree in Linguistics. Students are required to submit to the department a complete application, which includes a statement of purpose, a Stanford transcript, three letters of recommendation (at least one of which must be from a faculty member in Linguistics), and a proposed course of study (worked out in advance with a Linguistics adviser). Applicants for the coterminal degree may apply as early as their eighth quarter and no later than early in the eleventh quarter of undergraduate study. Decisions on admission to the coterminal degree rest with the Graduate Admissions Committee of the Department of Linguistics. For further application information and criteria, see the department's web pages.

GRADUATE PROGRAMS

MASTER OF ARTS

The University's basic requirements for the master's degree are discussed in the "Graduate Degrees" section of this bulletin. The following are additional departmental requirements. Candidates should review the department's "Guidelines for the A.M. and Ph.D. Degrees" for further particulars concerning these requirements.

1. Courses: candidates must complete a minimum of 40 units of graduate work in linguistics, including at least four courses in the student's area of specialization. No more than two courses should be at the 100 level.

Individual programs should be worked out in advance with an adviser who should ascertain that the necessary courses in the area of specialization are offered over the course of the year of anticipated enrollment. The overall grade point average (GPA) must be at least 'B' for all degree program courses.

2. Language: reading knowledge of a non-native language in which a substantial linguistic literature is written, with sufficient facility to understand and interpret linguistic research published in that language or in-depth research on the structure of a non-native language.

3. Thesis or Thesis Project: a research paper supervised by a committee of three faculty (normally fulfilled by up to 6 units of Linguistics 398, Directed Research).

DOCTOR OF PHILOSOPHY

The following requirements are in addition to the basic University requirements for the degree sought; see the "Graduate Degrees" section of this bulletin. Candidates should review the department's "Guidelines for the A.M. and Ph.D. Degrees" for further particulars concerning these requirements.

1. Language: candidates must demonstrate the ability to read at least one foreign language in which a substantial linguistic literature is written, with sufficient facility to understand and interpret linguistic research published in that language. (Particular areas of specialization may require additional research languages.)

In addition, each candidate must demonstrate an explicit in-depth knowledge of the structure of at least one language (normally neither the candidate's native language nor the language used for the reading exam). This requirement is fulfilled by writing an original research paper on a language.

2. Courses: a minimum of 80 units of graduate work beyond the A.B. or B.S. exclusive of dissertation units or, beyond the A.M., 40 units exclusive of dissertation units. A basic course requirement detailed in the Ph.D. guidelines guarantees that each student covers a sufficient set of subareas within the field.

Candidates must maintain a satisfactory record in the number and distribution of units completed. The overall course work GPA must be at least 'B,' and all of the "basic" courses should be completed with at least a 'B.'

3. Research: the prospective Ph.D. candidate is expected to complete two substantial qualifying papers. The deadline for completion of the first qualifying paper is the end of the Autumn Quarter of the second year; the deadline for completion of the second qualifying paper is the end of Spring Quarter of the second year. The subject matter of the two papers, although it may be related (for example, same language), must be clearly distinct. The requirement is fulfilled by 395A, B, Research Workshop (2 units each), and by oral discussion with a committee of at least three faculty members selected by the student and the faculty.

4. Candidacy: students must complete the basic course requirement (see item 2 above), one foreign language requirement (see item 1 above), and one qualifying paper (see item 3 above) by the end of their second year.
5. Teaching: at least three quarters serving as teaching assistant in a linguistics course; students on University fellowships teach four quarters.

6. Colloquia: two oral presentations exclusive of the oral presentation of the dissertation proposal (see item 7b below). This requirement is satisfied by class presentations, conference papers, or colloquium talks. Normally, both should be given during the first three years of study.

7. Dissertation:
   a) A written dissertation proposal is required by the end of the third year.
   b) Oral presentation of the dissertation proposal, preferably as a colloquium.
   c) Approval of the dissertation topic and appointment of a dissertation committee.
   d) Successful passing of a University oral examination on the dissertation and related areas.
   e) Dissertation (up to 15 units of 399).

Ph.D. MINOR

1. Courses: the candidate must complete 30 units of course work in linguistics at the 100 level or above, including 110, 120, and either 130A or 130B (100-level courses are waived if 200-level courses in the same area are taken), and at least three courses related to the area of specialization. Courses submitted for the minor must be incremental units beyond those used to satisfy the major. Individual programs should be worked out in advance with the student's Ph.D. minor adviser in linguistics.

2. Research Project (optional): the candidate may elect to present a paper which integrates the subject matter of linguistics into the field of specialization of the candidate.

3. The linguistics adviser or designee serves on the candidate's University oral examination committee and may request that up to one-third of the examination be devoted to the minor subject.

   Ph.D. Minor in Applied Linguistics — The Department of Linguistics participates in the Applied Linguistics Minor. See the “Language Center” section of this bulletin for full details.

COGNITIVE SCIENCE

Linguistics is participating with the departments of Computer Science, Philosophy, and Psychology in an interdisciplinary program in Cognitive Science for doctoral students. The program is intended to provide an interdisciplinary education as well as a deeper concentration in linguistics. Students who complete the Linguistics and Cognitive Science requirements receive a special designation in Cognitive Science along with the Ph.D. in Linguistics. To receive this field designation, students must complete 30 units of approved courses, 18 of which must be taken in two disciplines outside of linguistics. The list of approved courses can be obtained from the Cognitive Science program located in the Department of Psychology.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

The Department of Linguistics administers the Program in English for Foreign Students. Course offerings follow the Linguistics courses listed below.

LINGUISTICS

Courses with two-digit numbers are designed primarily for pre-majors. Courses with 100-level numbers are designed for majors, minors, and A.M. and Ph.D. minor candidates in Linguistics. Those with numbers 200 and above are primarily for graduate students, but with the consent of instructor some of them may be taken for credit by qualified undergraduates.

At all levels, the course numberings indicate a special area, as follows:
00-04 General

Linguistics

05-19 Phonetics, Phonology, and Morphology
20-39 Syntax, Semantics, and Pragmatics;
   Mathematical and Computational Linguistics
40-49 Language Acquisition and Psycholinguistics
50-59 Sociolinguistics
60-69 Language Change, Language, and Culture
70-84 Linguistic Analysis of a Language
85-94 Methods
95-99 Directed Work, Theses, Dissertations

1. Introduction to Linguistics — Introduction to the scientific study of language as a cognitive and social instrument. Topics: the sound patterns of languages, the structure of words and sentences, analysis of meaning; how children acquire language, how languages change, similarities and differences among languages, dialect variation; applications of linguistics. Additional 1-unit sections devoted to particular languages may be offered. GER:3b (DR:9)
   4 units, Win (Leben)

2. Language and Linguistics — Introduction to linguistics. Readings from The Language Instinct, and presentations by Stanford scholars. Prerequisite: consent of instructor.
   1 unit, Win (Beaver)

15Q. Stanford Introductory Seminar: Rhythm in Language, Poetry, and Music — Preference to sophomores. The rhythmic properties of speech and music, converging in songs and poetry. How metrical texts are built and how linguistic prominence is aligned with musical beats. Traditional and contemporary English verse forms: rap, and a selection of non-Western oral and written poetry. Goal is to explore the interplay of convention and natural form in verbal art. GER:3a (DR:7)
   3 units, Win (Kiparsky)

17Q. Stanford Introductory Seminar: Slips of the Tongue — Preference to sophomores. Slips of the tongue and other types of linguistic mistakes, using collections of real-life errors as windows on how languages are structured and used.
   3 units, Win (Zwicky)

30N. Stanford Introductory Seminar: Language and Law — Preference to freshmen. What special properties does the language of legislation have? How is language used in the courtroom, especially in interrogation of witnesses. What legal protections and constraints are there on language? Discussion of the 1st and 14th amendments, official English legislation, regulation of bilingual education. GER:3b (DR:9)
   4 units, Spr (Traugott)

34Q. Stanford Introductory Seminar: Language of Advertising — Preference to sophomores. Focus is on the use of language in advertising and on the structural organization of adverts or commercials. Student examples are used as a basis for discussion and discovery. What aspects of language used in advertising are effective, and why? How are adverts or commercials structured? What is the relation between the language and the images? What kinds of language (e.g., formal, informal, highly colloquial) are used in what kinds of advertising? Can advertising overstep the normal bounds of language use? Is advertising considered (by consumers) to be part of normal communication patterns? GER:3b (DR:9)
   3 units, Aut (Sells)

35Q. Stanford Introductory Seminar: Computers and Human Language — Preference to sophomores. Will computers use natural language to understand, communicate, or translate? Why is language processing difficult? How like a human must one be to understand human language? Conclusions of importance for machine translation, talking robots, and other technologies. The value of modern linguistic science for such technologies, and its limitations.
   3 units (Hubbard, Kay) alternate years, given 2001-02
44N. Stanford Introductory Seminar: Living with Two Languages—Preference to freshmen. The nature of bi- and multilingualism, with emphasis on the social and educational effects in the U.S. and worldwide, in individual vs. society, and in the child and the adult. The social, cognitive, psycholinguistic, and neurological consequences of bilingualism. Participation in planning and carrying out a survey of language use on campus to establish the language background, range of languages spoken, contexts of use, and general attitudes towards each language used. GER:3b (DR:9)
3 units, Spr (E. Clark)

62. History of the English Language—(Same as English 102.) The evolution of English in Britain and the U.S. from Anglo-Saxon times to the present; colonial and post-colonial English; the use of English worldwide. Emphasis is on issues in standardization, contact, the development of English pidgins and creoles, and of African American Vernacular English. GER:3a (DR:7)
3-5 units, Spr (Traugott)

64. Development of Englishes Around the World
3-5 units (Traugott) alternate years, given 2001-02

70. Structure of English Words—(Graduate students register for 270.) Analysis of vocabulary to determine word meanings. Goals: to increase vocabulary, and by discovering the principles behind changes in pronunciation and meaning, to take the mystery out of the processes that have made our vocabulary what it is today. Optional practicum for 5 units. GER:3a (DR:7)
4-5 units, Spr (Leben)

72. The Language of Short Stories—(Same as English 105.) Close reading of 20th-century British and American short stories, emphasizing perspective. Introduction to recent works in discourse analysis and conversational structure, as they inform the reading of fiction. GER:3a (DR:7)
3-5 units, Win (Traugott)

73. African American Vernacular English—Survey of the English vernacular spoken by African Americans in big city settings, and its relation to Creole English dialects spoken on the S. Carolina Sea Islands (“Gullah”), in the Caribbean, and in W. Africa. The history of expressive uses of African American English (in soundin’ and rappin’), and its educational implications. GER:3b,4b (DR:3 or 9)
3-5 units (Rickford) alternate years, given 2001-02

77. The Literary History of American English—The development of American English and ideas around “standard” and “literary,” with emphasis on 19th- and early 20th-century writings. Possible topics: American periodicals, dialect literature, folklore, regional literary standards, children’s literature, and women’s ways of conversing in print. 5 units (Heath) alternate years, given 2001-02

78. Language and Literary Theory—Examination of the central role in the linguists’ understanding of language structures and uses and grammatical processes, which have played a role in the development of literary criticism and theory. The ways literary language layers affect meaning through genre, imagery, voice, narration, and incorporation of more than one language or dialect. 5 units (Heath) alternate years, given 2001-02

85. Introduction to Teaching English as a Second Language—Practical approach to teaching English to non-native speakers, focusing on a survey of the features of English which present particular difficulties. Preparation of lessons, practice answering questions, and tutoring of an individual learning to speak English. 3-4 units, Spr (McChesney)

86. Practicum in Teaching English as a Second Language—Observation and participation in an English as a second language class on a regular basis. Weekly workshop in course planning. Prerequisite: 189, or concurrent enrollment in 85.
1-2 units, Spr (McChesney)

105. Phonetics—(Graduate students register for 205.) The study of speech sounds. How we produce them, how we perceive them, their acoustic properties. The influence of the production and perception systems on sound change and phonological patterns. Acoustic analysis and experimental techniques. Lab exercises. Prerequisite: 110 or consent of instructor.
4 units, Win (Reetz)

110. Introduction to Phonetics and Phonology—Introduction to the study of sounds as part of language. Survey of the sounds of the world’s languages; practice in producing and perceiving them. The theory of the sound patterns of languages, and analysis of phonological data. GER:2a (DR:5)
4 units, Spr (Leben)

120. Introduction to Syntax—Analyses of various grammatical constructions, primarily English, and their consequences for a general theory of language. Practical experience in formulating and testing linguistic hypotheses, reading, and constructing rules. GER:3b (DR:9)
4 units, Aut (Sells)

121. Intermediate Syntax
4 units (Staff) alternate years, given 2001-02

124. Introduction to Formal Universal Grammar—(Graduate students register for 224A.) Study a formal model of universal grammar explicitly designed to explain crosslinguistic variation in syntactic structure: nonconfigurality in Australian aboriginal languages, incorporation in native American languages and the Bantu languages of Africa, scrambling and head movement in more familiar European languages. General issues such as universal grammar design, analytic problems from a variety of natural languages. Prerequisites: introduction to syntax and some familiarity with logic or other symbolic systems, or consent of instructor.
4 units, Aut (Bresnan)

130A. Introduction to Linguistic Meaning—Linguistic meaning and its role in communication. Students learn how diagnostic tests can be used to categorize and separate various semantic phenomena (e.g., ambiguity and vagueness, entailment, and presupposition). How basic set theory and logic can be used to specify meanings and explain semantic phenomena. Pragmatic complications involving the assumptions and intentions of language users. For those who have not taken logic (e.g., Philosophy 159), an associated pass/fail 1-unit self-study lab is offered using Tarski’s World. Prerequisite: 120 or consent of instructor.
4 units (Staff) alternate years, given 2001-02

130B. Introduction to Lexical Semantics—Introduction to basic issues in the linguistic study of word meaning. Focus is on the core semantic properties and internal organization of three of the major word categories in natural languages: verbs, adjectives, and nouns. GER:3b (DR:9)
4 units, Win (Levin)

138. Introduction to Computational Linguistics—(Graduate students register for 238.) Introduction to the computational aspects of basic linguistic processes in morphology, syntax, and semantics. Study of key algorithms for parsing, generation, etc., and practical systems for such tasks as machine translation and information retrieval. Recommended: some programming experience. GER:2b (DR:6)
4 units, Aut (Kay)

140. Language Acquisition I—(Graduate students register for 240.) Survey of the present knowledge of processes of language acquisition
from a linguistic point of view. Recent and past literature. GER:3b (DR:9)
   4 units, Aut (E. Clark)

144. Introduction to Cognitive Science—The history, foundations, and accomplishments of the cognitive sciences, including presentations by leading Stanford researchers in Artificial Intelligence, Linguistics, Philosophy and Psychology. An overview of the issues addressed in the Symbolic Systems major.
   4 units, Spr (Beaver)

145. Language and Thought—(Enroll in Psychology 131.)
   4 units, Aut (Clark)

146. Language and Gender—Survey of the literature on how gender influences language use. Topics: differences in men’s and women’s speech styles, how these are acquired, how gender influences spoken vs. written language; the interaction of class and gender in language.
   GER:4c (DR:1)
   4 units, Aut (Hall)

146B. Language and Gender in Contemporary American Fiction—
   (Same as English 104C.)
   3 units, Win (Heath)

150. Language in Society—The ways in which language and society affect each other. Social dialects, class, ethnic, and gender differences in speech. Prestige and stigma associated with different ways of speaking; the official English movement. Stylistic variation; how speakers adapt their language to different audiences and different social contexts. For additional units, optional public service internship in an organization dealing with linguistic minorities or language-related issues (bilingual education or language rights), focusing on the field experience.
   GER:3b (DR:9) (WIM)
   4-5 units, Spr (Eckert)

153. Ebonics and other Vernaculars in Schools and Society—The role that Ebonics and other vernacular varieties (e.g., Gullah, Appalachian English, Hawaiian Pidgin, and the Creole varieties spoken in the Caribbean and by Caribbean children in N. America) play in their speaker’s schools and societies. Such vernaculars are often “blamed” for their speakers’ difficulties with literacy and job mobility, but they also play vibrant roles in the expressive fabric and social relationships of their speakers, and there is evidence that their potential usefulness in educational reform has been underestimated.
   4 units, Win (Rickford)

159. Language and Youth Culture—The sociocultural and linguistic studies through which urban youth have been defined and debated. Gang histories and structures, ghetto and project life, socialization of children and youth, and aesthetic expression (graffiti, vernaculars, music, drama, and pictoral art). Case study with investigations of language and culture patterns within institutions (e.g., families; schools; youth groups, including Boys’ and Girls’ Clubs, neighborhood basketball leagues, etc.), and “service” agencies. Emphasis is on U.S. youth, with comparative perspectives from other nations, especially with respect to language socialization.
   3 units, Win (Heath)

160. Introduction to Language Change—Variation and change as the natural state of language. The differentiation of dialects and languages over time. The determination and classification of historical relationships among languages, and reconstruction of ancestral stages. Types, rates, and explanations of change. Parallels with cultural and genetic evolutionary theory, and implications for the description and explanation of language in general. Languages as a window on prehistory: contact, migrations, and the vocabulary of ancient institutions. GER:3b (DR:9)
   4-5 units, Win (Fox)

165. Language, Nationalism, and Ideology—Study of how language becomes an ingredient of nationalism and the way in which it articulates and sustains nationalist claims. Emphasis is on anthropological linguistics theory in relation to broader conceptions of language and sociolinguistic inequality.
   4 units, Spr (Hall)

175. African-American English in Educational Context—(Enroll in Education 275.)
   3 units (Baugh) not given 2000-01

182. Introduction to Linguistic Typology—Introduction to language universals and linguistic typology, with emphasis on classification based on semantic, syntactic, and morphological factors. Cross-linguistic analysis of grammatical systems, and general considerations in the typological descriptions of languages.
   4 units (Sells) alternate years, given 2001-02

187. Field Methods—(Graduate students register for 287.) Hands-on overview of the methods by which linguists gather raw linguistic data about a language and begin the task of analyzing its structure. Working with a speaker of a language not previously studied by class participants, students attempt to develop a description of key aspects of the grammar of the language and examine methodologies for obtaining, storing, and manipulating data.
   4 units, Win (Dukes)

192. Phonetics—(Same as Linguistics 205.)
   Lab exercises. Prerequisite: 110 or consent of instructor.
   4 units, Win (Kiparsky)

197. Undergraduate Research Seminar—Introduction to research methods in linguistics and related disciplines. Provides a forum for students to work on a small project that helps define a focus for their linguistic studies and to prepare for the junior research requirement. Presentations, discussion, and final paper.
   2 units, Win (Staff)

199. Independent Study
   1 or more units, Win, Spr (Staff)

200. Foundations of Linguistic Theory—Theories that have shaped 20th-century linguistics; recurrent themes and descriptive practice.
   4 units, Aut (Traugott)

201. Foundations of Linguistic Analysis—Primarily for graduate students. Introduction to the leading ideas of linguistic description and linguistic argumentation. The fundamental representational notions in phonology, syntax, and semantics, and the place of these notions in wider linguistic analysis.
   4 units, Win (Sells)

   4 units, Win (Kiparsky)

205. Phonetics—(Same as 105.) The study of speech sounds: how we produce them, how we perceive them, their acoustic properties. The influence of production and perception systems on sound change and phonological patterns. Acoustic analysis and experimental techniques. Lab exercises. Prerequisite: 110 or consent of instructor.
   4 units, Win (Reetz)

206. Phonology—Cross-linguistic treatment of stress, tone, syllable structure, and harmonic processes. Their analysis in nonlinear frame-
works, including metrical and autosegmental phonology. Emphasis is on explaining phonological phenomena in Optimality Theory.


4 units, Aut (Zwicky)

208A. Phonology Seminar—Survey of the past few decades' worth of substantive evidence for the syllable and mora, including their potential roles as feature-bearing units, as domains over which phonological generalizations can be stated, and as ways of making boundaries. Interpreting phonological phenomena in the light of data from metrics, psycholinguistics, and phonetics. Past and present theories of the syllable and mora.

1-4 units, Aut (Leben)

220. Cross-Linguistic Syntax—The types of critical phenomena found in diverse syntactic systems and their implications for syntactic theory. Emphasis is on cross-linguistic diversity, typological variation, and their relation to general theoretical issues.

4 units, Aut (Bresnan)

220C. Themes in Generative Syntax—Examination of a theme relevant to current issues in syntax, e.g., mathematical foundations, historical antecedents, or methodologies of data collection.

1-4 units (Staff) alternate years, given 2001-02

221A. Foundations of English Grammar—A systematic introduction to the formal analysis of English grammar using the framework of Head-Driven Phrase Structure Grammar (HPSG). Topics: feature structure modeling, lexical and phrasal organization in terms of type hierarchies and constraint inheritance, clausal types, patterns of complementation, the auxiliary system, extraction dependencies, wh-constructions, and the syntax-semantics interface.

4 units, Win (Sag)

221B. Studies in Universal Grammar—Selected studies focus on the in-depth grammatical analysis of individual languages. Builds directly on the theoretical foundations presented in 221A. Topics vary each year.

1-4 units, Spr (Dukes, Sag)

222A. Lexical Foundations of Syntax—Introductory syntax, focusing on the role of the verb in the determination of sentence syntax. Topics: the argument/adjunct distinction, subcategorization and argument structure, operations on argument structure vs. operations on lexical semantic representation, grammatical function changing rules, thematic hierarchies, principles governing argument expression, and unaccusativity.

4 units, Win (Levin)

222B. Lexical Foundations Seminar

1-2 units, Spr (Levin)


2 units (Sells) alternate years, given 2001-02

223B. Introduction to the Minimalist Program—The development of the Minimalist Program from Government-Binding Theory, and recent innovations in the approach. Prerequisite: knowledge of Government-Binding Theory.

2 units (Sells) alternate years, given 2001-02

223C. Recent Works in the Minimalist Program

1-4 units, Aut (Sells)

224A. Introduction to Formal Universal Grammar—Same as 124; see 124.

4 units, Aut (Bresnan)

224B. Lexical Functional Grammar Seminar

1-2 units, Win (Bresnan)

225. Syntactic Variation—Case studies in variation (between individual speakers, regional and social dialects, and styles) in the details of syntactic constructions, considering implications for syntactic theory.

1-4 units, Spr (Zwicky)

227A. Optimality Theoretic Syntax—Develops Optimality Theory as a coherent framework for the study of syntax, emphasizing the typological-functional grounding of constraints with general syntax. The goal is to enable the OT framework in research. Topics vary each year, centering on issues surrounding prominence hierarchies (person, animacy, obliqueness, grammatical relations, definiteness, etc.) and their role in the syntax of case, voice, agreement, and word order.

1-4 units, Win (Bresnan)


4 units, Win (Beaver)

230B. Semantics and Pragmatics—Expands on 230A. Standard approaches to formal semantics (Montague Grammar, DRT, and basic dynamic semantics). Analyses of selected semantic phenomena in these frameworks. Prerequisites: 230A; or combination of 130 and Philosophy 159 and 160.

1-4 units, Spr (Peters)

233A. Lexical Semantics—Introduction to issues in word meaning, focused primarily around verbs. Overview of the core semantic properties of verbs and the organization of the verb lexicon. Approaches to lexical semantic representation, including semantic role lists, prototypes, and causal and aspectual theories of event conceptualization.

4 units, Aut (Levin)

233B. Semantics Seminar—Advanced topics of current interest to students and instructor.

1-4 units Win (Beaver)

233C. Semantics Seminar: Tense and Event Semantics

1-4 units, Spr (Condoravdi)

233D. Semantics Research Seminar—Advanced topics of current interest to students and instructor.

1-4 units, Spr (Beaver)

234. Introduction to Discourse Analysis—Discussion of the methods and models of varying approaches to language beyond the sentence. Topics: information packaging, topic, and focus; discourse markers; and models of varying approaches to language beyond the sentence. Prerequisites: information packaging, topic, and focus; discourse markers; tense and aspect; their different uses in conversation and narrative; spoken and written discourse.

4 units (Traugott) alternate years, given 2001-02

235. Mathematical Linguistics—Introduction to structures and methods from mathematical logic which are useful in linguistic theories of the
structure and meaning of natural languages. Prerequisite: Computer Science 154 or consent of instructor.

1-4 units (Peters) alternate years, given 2001-02

236. Corpora, Frequency, and Non-Discreteness in Syntax—Seminar discussion of the quantitative description of syntactic phenomena based on corpus evidence. Frequency-based characterizations of syntactic phenomena (subcategorization, argument structure alterations, "heavy" NP shift, etc.).

1-4 units (Manning), alternate years, given 2001-02

237. Natural Language Processing—Develops an in-depth understanding of the algorithms available for the processing of linguistic information and the underlying computational properties of natural languages. Morphological, syntactic, and semantic processing from a linguistic and an algorithmic perspective. Focus is on modern quantitative techniques in NLP: using large corpora, statistical models for acquisition, representative systems. Prerequisites: 138/238 or Computer Science 121/221, and programming experience. Recommended: basic familiarity with logic and probability.

4 units, Spr (Manning)

237D. NLP Reading Seminar

1 unit, Aut, Win, Spr (Manning)

238. Introduction to Computational Linguistics—Same as 138; see 138.

4 units, Aut (Kay)

239A. Topics in Computational Linguistics

1-4 units (Kay) alternate years, given 2001-02

240. Language Acquisition I—Same as 140; see 140.

4 units, Aut (E. Clark)

241. Language Acquisition II: Lexicon and Syntax in Acquisition—Advanced topics in language acquisition.

1-4 units, Win (E. Clark)

245. Theories of Speech Perception—How does the acoustic speech signal guide us to identify a word in our mental lexicon? Several phonetic theories (e.g., Motor Theory, Direct Realist Theory, Invariance Theory, Klatt's LAFS model, Steven's Auditory Landmarks model, etc.) try to explain how a signal is converted into linguistically relevant entities, and psycholinguistics theories (e.g., Cohort Model, Logogen Model, Neighborhood Activation Model, etc.) try to explain how words are accessed in the mental lexicon. Prerequisite: 110 or consent of instructor.

4 units, Win (Reetz)

246. Psycholinguistics—(Enroll in Psychology 214.)

1-3 units, Spr (H. Clark)

247. Ethnography of Communication

4-5 units (Heath) alternate years, given 2001-02

250. Sociolinguistic Theory and Analysis—The kinds of problems with which sociolinguists deal and the theories, models, and methods of analysis which they have developed. Emphasis is on what general linguistics might gain from the socio-linguistics approach to problems of linguistic theory and description, and linguistic change. Prerequisite: graduate standing in Linguistics or consent of instructor.

4 units, Win (Eckert)

251. Pidgin and Creole Sociolinguistics—Key issues in sociolinguistics and pidgin-creole studies, especially issues whose understanding in one field has been assisted by methods or advances in the other, including diglossia, the acts of identity model, the notion of speech community, variable rules, implicational scaling, and the scope of sociolinguistic competence.

4 units, Spr (Rickford)

254. SLIC: Style, Language, Ideology, and Collaborative—Interdisciplinary seminar addressing the intersection between linguistic and social theories. Grounded in emerging research on personal and group linguistic styles, explores the relation between these styles and linguistic, political, and social ideologies. Students have research interests in linguistic, anthropological, or other social science perspectives. Ongoing discussions of major student research projects.

1-4 units (Staff) alternate years, given 2001-02

255A. Topics in Sociolinguistics Style—Introduces the data of language variation, developing a critical approach and skills in employing the data in sociolinguistic argumentation.

1-4 units, Win (Eckert)

256. Topics in Sociolinguistics: Language and Sexuality—The role of language in the social construction and articulation of sexual identity, sexuality, and desire. Topics: divergent cultural expressions of sexual identity; gay, lesbian, and transgender discourse strategies; the discursive construction of heterosexuality; linguistic gender-bending; intersections of linguistics theory and queer theory; performativity and resignification; the place of English in emergent non-Western gay communities; and the role of sexuality in bilingualism. Ethnographies on the relationship between language and sexuality in a variety of cultures are read alongside texts in critical gender/sexuality theory.

4 units, Win (Hall)

257. Narrative and Identity—The ways identities are constructed, negotiated, and affirmed through oral narrative, particularly life stories, personal narratives, and institutional narratives. Survey of the different approaches to the analysis of oral narrative, as developed in the ethnography of speaking, interactive sociolinguistics, conversation analysis, and linguistic and cultural anthropology. Students develop technical skills in the transcription and analysis of narrative and incorporate these skills into a final "mini-ethnography" of language and identity in a particular community.

4 units, Spr (Hall)

258. Sociolinguistic Variation—Advanced introduction to the study of linguistic variability in time, space, and society. Theoretical issues are related to social and linguistic constraints in variation, and issues and methods in the quantitative analysis of variation.

1-4 units (Eckert) alternate years, given 2001-02

260A. Historical Phonology and Morphology—Sound change and analogical change in the perspective of linguistic theory. Internal and comparative reconstruction.

4 units (Kiparsky) alternate years, given 2001-02

260B. Historical Morpho-Syntax

1-4 units, Spr (Kiparsky)

263. Language and Political Economy—(Enroll in Cultural and Social Anthropology 227.)

5 units, Aut (Inoue)

266. Topics in Historical Linguistics: Grammaticalization—The kinds of issues that historical linguists address when studying grammaticalization, focusing on the theories and models currently being debated. The hypothesis of unidirectionality, the role of reanalysis in grammaticalization, and differences between grammaticalization and lexicalization.

1-4 units (Traugott) alternate years, given 2001-02

270. Structure of English Words—Same as 70; see 70.

4-5 units, Spr (Leben)
273. Advanced AAVE
4 units, Aut (Rickford)

3 units (Baugh) not given 2000-01

4 units, Aut (Matsumoto) not given 2000-01

281. Japanese Pragmatics—(Enroll in Asian Languages 281.)
4 units (Matsumoto) not given 2000-01

286. Sociolinguistic Field Methods—Overview of and practice in the principal methods of data collection in sociolinguistics, with an assessment of their strengths and weaknesses. 4 units (Rickford) alternate years, given 2001-02

287. Field Methods—Same as 187; see 187.
4 units, Win (Dukes)

289. Linguistics and the Teaching of English as a Second/Foreign Language—(Same as 189.) Methods and techniques for teaching languages, using ideas from modern linguistics, and language acquisition theory. Focus is on teaching English, but the principles underlying methods and techniques discussed are applicable to teaching any language.
4-5 units, Win (Hubbard)

290. Introduction to Linguistics for Educational Researchers—(Enroll in Education 289.)
4 units, Aut (Baugh)

291. Structure of Chinese—Introduction to the grammatical structure of Chinese, focusing on syntax and semantics. Designed to help students, who have had one year or more of modern Chinese, develop a sophisticated knowledge of Chinese grammar. Prerequisite: 3 or equivalent, or consent of instructor.
4 units, Spr (Sun)

292. The History of Chinese—(Enroll in Asian Languages/Chinese 192/292.)
4 units (Sun) not given 2000-01

295. The History and Structure of Modern Russian—The major changes in the structure of the Russian language over the last millennium: interaction with Old Church Slavic, sound changes, simplification of the noun, the rise of verb prefixation and the modern system of aspect, and stylistic differentiation and interaction. Prerequisite: three years of language study, or consent of instructor.
3-4 units, Aut (Schubach)

360. Seminar: Theories of Narrative and Genre—(Same as English 360.)
4-5 units, Aut (Heath)

395A,B. Research Workshop—Restricted to students in the doctoral program. Student presentations of research toward qualifying papers.
395A. 1-2 units, Spr (E. Clark)
395B. 1-2 units, Spr (Sells)

397. Directed Reading
1-5 units, any quarter (Staff)

1-6 units, any quarter (Staff)

399. Dissertation Research
1-15 units, any quarter (Staff)

435A. Research Seminar in Applied Linguistics—(Enroll in Education 435X.)
1-4 units, Spr (Baugh)

ENGLISH AS A SECOND LANGUAGE
(683-699)

These courses represent offerings for non-native speakers in Autumn, Winter, and Spring quarters. Enrollment in one or more courses may be required of, or recommended to, current graduate students from other countries after they have taken the English screening examination. To enroll, students must come to the English for Foreign Students office the first day of each quarter.

During the Summer Session, courses in spoken and written English are offered. Two six-week intensive courses are also offered during the summer. Summer visitors must apply directly to the EFS program.

690A. Interacting in English—Strategies for effective interaction in academic settings. Emphasis is on functional language used in typical university settings, including active listening, asking questions, and contributing ideas and opinions. Activities include simulation and discussion, with feedback on pronunciation, grammar, and usage.
3 units, Aut (Hubbard)

690B. Academic Discussion—The refinement and practice of discussion skills, with attention to pronunciation, grammar, and appropriateness for specific tasks. Preparation for effective participation in the classroom and research group communication. Detailed feedback on pronunciation, grammar, and usage. Prerequisite: 690A or consent of instructor.
3 units, Aut, Win, Spr (Rylance, Staff)

691. Oral Presentation—For advanced graduate students. Practice in academic presentation skills; strategy, design, organization, and use of visual aids. Focus is on improving fluency and delivery style, with videotaping for extensive feedback on language accuracy and usage. Prerequisite: 695 or consent of instructor.
3 units, Win, Spr (Rylance, Mawson, Staff)

692. Speaking and Teaching in English—For non-native speakers who must teach in English. Focus is on developing clarity, intelligibility, and effectiveness through weekly presentations simulating actual teaching assistant responsibilities.
1-3 units, Aut, Spr (McChesney, Rylance)

693A. Listening Comprehension—Strategies for effective listening in an academic setting, focusing on identifying key ideas in lectures. Practice in understanding words and phrases commonly encountered in classroom settings. Work with computer-based exercises promotes comprehension of rapid, natural speech.
3 units, Aut (Hubbard, Staff)

693B. Listening and Communication—The development of listening strategies and vocabulary for understanding English in a variety of academic and non-academic contexts. Discussion and interpretation improve comprehension of communicative intent. Computer-based, video exercises, plus an individual project. Prerequisite: 693A or consent of instructor.
3 units, Aut, Win (Hubbard, Rylance)

694A. The Language of Interpersonal and Professional Relationships—For advanced graduate students. Analysis and practice of communicative intent in interpersonal relationships. Use of indirectness,
assertiveness, humor. Prerequisite: 693A,B or consent of instructor.
3 units, Win (McChesney, Staff)

694B. Communication Strategies in Professional Life—For advanced
graduate students. Task-based practice of language appropriate for
professional settings such as consulting, startups, and related teamwork.
Simulation of the roles of manager, applicant, subordinate, and co-
worker. Prerequisite: 693A, 694A, or consent of instructor.
3 units, Spr (McChesney)

695A. Pronunciation and Intonation—Recognition and practice of
American English sounds, stress, and intonation patterns for greater
comprehension and intelligibility. Analysis of problem areas. Biweekly
tape assignments and tutorials.
3 units, Aut, Win, Spr (Mawson, Staff)

695B. Advanced Pronunciation and Intonation—Continuation of
695A, focusing on American English sounds, stress, rhythm, and intona-
tion patterns. Emphasis is on self-monitoring, integrated with short
presentations. Biweekly tape assignments and tutorials. Prerequisite: 695A.
2 units, Win, Spr (Mawson)

698A. Writing Academic English—Preparation of graduate students to
write academic papers; emphasis is on fluency, organization, documen-
tation, and appropriateness for specific writing tasks required in course
work.
3 units, Aut, Win, Spr (McChesney, Rylance)

698B. Advanced Graduate Writing—For graduate students experi-
enced in English writing and currently required to write for courses and
research. Class meetings and frequent individual conferences. Prerequisite:
698A.
3 units, Aut, Win, Spr (Hubbard, Staff)

DIVISION OF LITERATURES,
CULTURES, AND LANGUAGES

Chair of the Executive Committee: to be announced

Executive Committee: Elizabeth Bernhardt (Language Center), Grego-
ry Freidin (Slavic Languages and Literatures), Orrin Robinson (Ger-
man Studies), Jeffrey Schnapp (French and Italian), Chaofen Sun
(Asian Languages), Yvonne Yarbro-Bejarano (Spanish and Portu-
guese)

The Division of Literatures, Cultures, and Languages embraces six
academic departments: Asian Languages and Literatures, Comparative
Literature, French and Italian, German Studies, Slavic Languages and
Literatures, Spanish and Portuguese, and the Language Center, which is
charged with facilitating and overseeing all language instruction at
 Stanford. All the member departments of the division offer full-fledged
academic programs leading to bachelor’s, master’s, and doctoral degrees.
The division brings together scholars and instructors dedicated to the
study of foreign literatures, cultures, and languages from humanistic and
interdisciplinary perspectives. The departments in the division are distin-
guished by the quality, size, and diversity of their faculty, a wide va-
nety of approaches to cultural tradition and expression, and the intense
focus on the mastery of foreign languages. This wealth of academic re-
sources, together with small classes and the emphasis on individual ad-
vising, creates a superior opportunity for students who wish to be intro-
duced to or develop a deeper understanding of non-English speaking
cultures.

The division’s member departments and the Language Center offer
instruction at all levels, including introductory and general courses that
do not require knowledge of a foreign language. The more advanced and
specialized courses requiring skills in a foreign language are listed un-
der the specific departments and programs. These introductory and gen-
eral courses, among them many Stanford Introductory Seminars with
preferences for freshmen and sophomores, are listed below. As indicat-
ed, they satisfy a variety of the undergraduate requirements and can serve
as a basis for developing a minor or a major program in the member de-
partments. For descriptions of the minor and major programs, see the
sections under the individual departments.

COURSES

See the respective department listings for course descriptions and
General Education Requirements (GER) information.

STANFORD INTRODUCTORY SEMINARS

PREFERENCE TO FRESHMEN

ASIAN LANGUAGES

71N. Stanford Introductory Seminar: Language and Gender in Ja-
apan—Myths and Reality
3 units, Win (Matsumoto)

COMPARATIVE LITERATURE

70N. Stanford Introductory Seminar: The Bible and World Culture
3 units (Parker) not given 2000-01

80N. Stanford Introductory Seminar: The Science Wars—Does
Physics Get Closer to Reality than Poetry?
5 units (Rorty) not given 2000-01

FRENCH AND ITALIAN

108N. Stanford Introductory Seminar: Female Saints—The Rhet-
oric of Religious Perfection
4 units, Aut (Cazelles)

GERMAN STUDIES

123N. Stanford Introductory Seminar: The Brothers Grimm and
their Fairy Tales
4 units, Spr (Robinson)

SLAVIC LANGUAGES AND LITERATURES

13N. Stanford Introductory Seminar: Russia, Russian, Russians
3-4 units, Spr (Schupbach)

SPANISH AND PORTUGUESE

11IN. Stanford Introductory Seminar: Contemporary Spain—The
Challenge of Change, from Fascism to Democracy (1939 to Present)
3 units, Aut (Haro)

PREFERENCE TO SOPHOMORES

COMPARATIVE LITERATURE

24Q. Stanford Introductory Seminar: Ethnicity and Literature
3-5 units, Aut (Palumbo-Liu)

84Q. Stanford Introductory Seminar: Shakespeare, Playing, Gender
3 units, Win (Parker)

115Q. Stanford Introductory Seminar: Thinking in the Present—
Discussions about 20th-Century European Philosophy
3 units, Aut (Gumbrecht)

GERMAN STUDIES

126Q. Stanford Introductory Seminar: Reading German Litera-
ture—An Introduction
4 units, Aut (Berman)

SPECIAL LANGUAGE PROGRAM

199Q. Stanford Introductory Seminar: Literature and Culture of
Modern Greece
3-5 units, Aut (Prionas)
TAUGHT IN ENGLISH

ASIAN LANGUAGES

92. Traditional East Asian Civilization: Japan
   5 units, Win (Hare)

131/231. Chinese Poetry in Translation
   4 units, Win (Liu)

132. Chinese Fiction and Drama in Translation
   4 units, Spr (Schaberg)

133A/233A. Introduction to Modern Chinese Literature
   4 units (Sang) not given 2000-01

137/237. Classical Japanese Fiction in Translation
   4 units (Staff) not given 2000-01

138. Modern Japanese Literature in Translation
   4 units, Win (Reichert)

FRENCH AND ITALIAN

189Q. Stanford Introductory Seminar: Romance—Texts and Movies
   4 units, Spr (Cazelles)

190Q. Stanford Introductory Seminar: Parisian Cultures of the 19th
   and Early 20th Century
   4 units, Spr (Bertrand)

192E. Images of Women in French Cinema: 1930-1990
   3-5 units, Spr (Apostolidés)

201E. New Methods and Sources in French and Italian Studies
   1-4 units, Aut (Parrine)

254E. Introduction to French Philosophy: From 1943 to the Present
   3-5 units, Spr (Dupuy)

369E. The Disciplines of Literature—(Same as Comparative Literature, 369.)
   5 units, Aut (Gumbrecht, Schnapp)

GERMAN STUDIES

38A. Introduction to the Germanic Languages
   not given 2000-01

241A. Deutsche Geistesgeschichte I: 18th-Century German Thought
   3-5 units, Aut (Mueller-Vollmer)

242A. Deutsche Geistesgeschichte II: 19th-Century German Thought
   3-5 units, Win (Pan)

243A. Deutsche Geistesgeschichte III: 20th-Century German Thought
   3-5 units, Spr (Poor)

SLAVIC LANGUAGES AND LITERATURES

110. Russian “Crash” Course for Departing Students
   1 unit, Spr (Schupbach)

145/245. The Age of Experiment (1820-1850)
   3-4 units, Aut (Greenleaf)

146/246. The Age of Transgression: Russian Literature from Tur- 
   genev through Tolstoy
   4 units, Win (Safran)

147/247. The Age of Revolution: Russian Literature and Culture
   since 1917
   3-4 units, Spr (Freidin)

151. Dostoevsky and His Times
   4 units, Win (Frank)

155/255. Anton Chekhov and the Turn of the Century
   not given 2000-01

166/266. Russia on the Silver Screen: U.S., Western European, and
   Émigré Cinema
   not given 2000-01

168/268. Documentary Film and Fiction in Russian and Western
   Cinema, 1920 to the Present
   not given 2000-01

170B/270B. Pushkin in the Romantic Context
   not given 2000-01

221. Modernism and the Jewish Voice in Europe
   not given 2000-01

SPANISH AND PORTUGUESE

130. Spanish Cultural Perspectives
   4 units, Spr (Haro)

131. Spanish American Cultural Perspectives
   4 units, not given 2000-01

132. Mexican and Chicano Cultural Perspectives
   4 units, not given 2000-01

135. Caribbean Cultural Perspectives
   4 units, not given 2000-01

168E. Chilean Studies: Modern Chilean Culture through Music, 
   Film, and Literature 1945-1997
   3-5 units, Spr (Missana)

SPECIAL LANGUAGE PROGRAM

125A. The Contemporary Arab World and Culture through Literature
   4 units, Aut (Barhoum)

125C. Contemporary Arab Women Writers and Issues
   4 units (Barhoum) not given 2000-01

125D. The Arab World through Travel Literature
   4 units, Spr (Barhoum)

MATHEMATICAL AND
COMPUTATIONAL SCIENCE

Chair: Bradley Efron
Committee in Charge: Takeshi Amemiya (Economics), Gunnar Carls- 
son (Mathematics), Richard Cottle (Management Science and Engi- 
neering), Thomas M. Cover (Statistics, and Electrical Engineering), 
Bradley Efron (Statistics), Gene Golub (Computer Science), George 
Papanicolaou (Mathematics), David Rogosa (Education), David Sieg- 
mund (Statistics), Leon Simon (Mathematics), Carlo Tomasi 
(Computer Science), Arthur F. Veinott Jr. (Management Science and 
Engineering)
Program Administrator: Helen Tombropoulos
This interdepartmental, interschool undergraduate program is designed as a major for students interested in the mathematical and computational sciences, or in the use of mathematical ideas and analysis in problems in the social or management sciences. It provides a core of mathematics basic to all of the mathematical sciences and an introduction to the concepts and techniques of automatic computation, optimal decision-making, probabilistic modeling, and statistical inference. It also provides an opportunity for elective work in any of the mathematical sciences disciplines at Stanford.

The program utilizes the faculty and courses of the departments of Computer Science, Management Science and Engineering, Mathematics, and Statistics. It prepares students for graduate study or employment in the mathematical and computational sciences or in those areas of applied mathematics which center around the use of high-speed computers and are concerned with the problems of the social and management sciences.

### UNDERGRADUATE PROGRAMS

#### BACHELOR OF SCIENCE

The requirement for the bachelor’s degree, beyond the University’s basic requirements, is an approved course program of 76 to 80 units, distributed as follows:

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mathematics:</strong> 33-34 units</td>
<td></td>
</tr>
<tr>
<td>Math. 41, 42. Single Variable Calculus</td>
<td>A, W</td>
</tr>
<tr>
<td>or Math. 19</td>
<td>A, W</td>
</tr>
<tr>
<td>and Math. 20</td>
<td>W, S</td>
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<tr>
<td>or Math. 21</td>
<td>S</td>
</tr>
<tr>
<td>Math. 52. Integral Calculus of Several Variables</td>
<td>A, W, S</td>
</tr>
<tr>
<td>or Math. 110. Applied Number Theory and Field Theory (WIM)</td>
<td>S</td>
</tr>
<tr>
<td>or Math. 120. Modern Algebra (WIM)</td>
<td>A</td>
</tr>
<tr>
<td>Math. 113. Linear Algebra and Matrix Theory</td>
<td>A, W</td>
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<tr>
<td>or Math. 104. Matrix Theory and Its Applications</td>
<td>S</td>
</tr>
<tr>
<td>Math. 130. Ordinary Differential Equations</td>
<td>A, W</td>
</tr>
<tr>
<td>or Math. 53. Ordinary Differential Equations with Linear Algebra</td>
<td>A, W, S</td>
</tr>
</tbody>
</table>

One of the following:

- Comp. Sci. 137. Introduction to Scientific Computing | A | 4 |
- Math. 160A. First Order Logic (enroll in Philosophy) | W | 4 |

#### Computer Science (CS): 16-18 units

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
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</thead>
<tbody>
<tr>
<td>CS 106X. Programming Methodology and Abstractions (Accelerated)</td>
<td>A, W, S</td>
</tr>
<tr>
<td>or CS 106A and B may be substituted</td>
<td>A, W, S</td>
</tr>
<tr>
<td>CS 103A. Discrete Mathematics for Computer Science</td>
<td>A, W</td>
</tr>
<tr>
<td>CS 103B. Discrete Structures</td>
<td>W, S</td>
</tr>
<tr>
<td>CS 103X. Discrete Structures (Accelerated)</td>
<td>S</td>
</tr>
</tbody>
</table>

Two of the following:

- CS 107. Programming Paradigms | A, S | 5 |
- CS 137. Introduction to Scientific Computing | A | 4 |
- CS 154. Introduction to Automata and Complexity Theory | W, S | 4 |
- CS 161. Design and Analysis of Algorithms | A, W | 4 |
- CS 260. Concrete Mathematics (not given 2000-01) | 3 |

#### Management Science and Engineering (MS&E): 8-9 units

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engr. 62. Introduction to Optimization</td>
<td>A, S</td>
</tr>
<tr>
<td>MS&amp;E 121. Introduction to Stochastic Modeling</td>
<td>S</td>
</tr>
<tr>
<td>or three of the following:</td>
<td></td>
</tr>
<tr>
<td>MS&amp;E 211. Linear and Nonlinear Optimization</td>
<td>A</td>
</tr>
<tr>
<td>MS&amp;E 212. Network and Integer Programming</td>
<td>A</td>
</tr>
<tr>
<td>MS&amp;E 224. Stochastic Models in Operations Research (not given 2000-01)</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 251. Stochastic Decision Models</td>
<td>W</td>
</tr>
</tbody>
</table>

#### Statistics: (11 units)

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stat. 200. Introduction to Statistical Inference</td>
<td>W</td>
</tr>
<tr>
<td>Stat. 201. Statistical Methods</td>
<td>W</td>
</tr>
<tr>
<td>or Stat. 203. Analysis of Variance (not given 2000-01)</td>
<td>3</td>
</tr>
</tbody>
</table>

### ELECTIVES (9 units)

Three courses in mathematical and computational science, 100-level or above, and at least 3 units each. At least one must be chosen from the following:

#### Course No. and Subject | Qtr. and Units |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ. 160. Game Theory and Economic Applications</td>
<td>A</td>
</tr>
<tr>
<td>Econ. 171-172. Intermediate Econometrics I-II</td>
<td>W, S</td>
</tr>
<tr>
<td>Econ. 181. Optimization and Economic Analysis</td>
<td>A, W</td>
</tr>
<tr>
<td>Elect. Engr. 261. The Fourier Transform and Its Applications</td>
<td>S</td>
</tr>
<tr>
<td>MS&amp;E 211. Linear and Nonlinear Optimization</td>
<td>A</td>
</tr>
<tr>
<td>MS&amp;E 212. Network and Integer Programming</td>
<td>A</td>
</tr>
<tr>
<td>MS&amp;E 224. Stochastic Models in Operations Research (not given 2000-01)</td>
<td>3</td>
</tr>
<tr>
<td>MS&amp;E 251. Stochastic Decision Models</td>
<td>W</td>
</tr>
<tr>
<td>Math. &amp; Comp. Sci. 100. Mathematics of Sports (enroll in Stat. 50; not given 2000-01)</td>
<td>3</td>
</tr>
<tr>
<td>Math. 106. Introduction to Theory of Functions of a Complex Variable</td>
<td>A</td>
</tr>
<tr>
<td>Math. 116. Complex Analysis</td>
<td>W</td>
</tr>
<tr>
<td>Math. 132. Partial Differential Equations II</td>
<td>S</td>
</tr>
<tr>
<td>Stat. 217. Introduction to Stochastic Processes</td>
<td>W</td>
</tr>
</tbody>
</table>

For Computer Science (CS), suggested electives include those courses not taken under item 3 of the above Computer Science list and the following:

- CS 108. Object Oriented Systems Design | A, W | 4 |
- CS 110. Introduction to Computer Systems and Assembly Language Programming | S | 4 |
- CS 140. Operating Systems | A, W | 4 |
- CS 143. Compilers | A, S | 4 |
- CS 157. Logic and Automated Reasoning | A, S | 4 |
- CS 161. Design and Analysis of Algorithms | A, W | 4 |
- CS 194. Software Project (prereq. CS 108) | W, S | 3 |
- CS 211. Logic Design (enroll in Elect. Engr. 275) | A, W | 3 |
- CS 221. Artificial Intelligence: Principles and Techniques | A | 4 |
- CS 223A. Introduction to Robotics | W | 3 |
- CS 223B. Introduction to Computer Vision | W | 3 |
- CS 225A. Experimental Robotics | S | 3 |
- CS 228. Knowledge Representation and Reasoning under Uncertainty | W | 3 |
- CS 229. Machine Learning | W | 3 |
- CS 237A. Numerical Linear Algebra | A | 3 |
- CS 243. Advanced Compiling Techniques | W | 4 |

With the adviser’s approval, courses other than those offered by the sponsoring departments may be used to fulfill part of the elective requirement. These may be in biology, economics, electrical engineering, industrial engineering, medicine, and so on, that might be relevant to a mathematical sciences major, depending on the particular interest of the student.

1. At least three quarters before graduation, majors must file with their advisers a plan for completing degree requirements.
2. All courses used to fulfill major requirements must be taken for a letter grade with the exception of courses offered satisfactory/no credit only.
3. A course used to fulfill the requirements of one section of the program may not be applied toward the fulfillment of the requirements of another section.
4. The student must have a grade point average (GPA) of 'C' or better in all course work used to fulfill the major requirement.

### MINORS

The minor in Mathematical and Computational Science is intended to provide an experience of the four constituent areas: computer science (CS), mathematics, management science and engineering (MS&E), and statistics. Four basic courses are required:

1. CS 106X. Programming Methodology and Abstractions or CS 106A, B. Programming Methodology
3. Engr. 62. Introduction to Optimization or MS&E 121. Introduction to Stochastic Modeling
In addition to the above, the minor requires three courses (total) from the following, two of which must be in different departments:

**CS 107. Programming Paradigms**

**CS 137. Introduction to Scientific Computing**

**CS 138. MATLAB and MAPLE for Science and Engineering Applications**

**CS 154. Introduction to Automata and Complex Theory**

**CS 260. Concrete Mathematics**

**Elec. Engr. 261. The Fourier Transform and its Applications**

**Econ. 160. Game Theory and Economic Applications (prereq. Econ 51)**

**Econ. 171-172. Intermediate Econometrics II-III**

**Econ. 181. Optimization and Economic Analysis**

**Elect. Engr. 251. Linear and Nonlinear Optimization/Programming**

**Math. 104. Matrix Theory and Its Applications**

**Math. 106. Introduction to Theory of Functions of a Complex Variable**

**Math. 110. Applied Number Theory and Field Theory**

**Math. 115. Fundamental Concepts of Analysis or Math. 171**

**Math. 131. Partial Differential Equations I**

**Math. 132. Partial Differential Equations II**

**Math. 160A. First Order Logic**

**Stat. 200. Introduction to Statistical Inference**

**Stat. 201. Statistical Methods**

**Stat. 202. Data Analysis II**

**Stat. 203. Analysis of Variance**

**Stat. 217. Introduction to Stochastic Processes**

**MS&E 211. Linear and Nonlinear Optimization/Programming**

**MS&E 224. Stochastic Models in Operations Research**

**MS&E 251. Stochastic Design Models**

**MS&E 252. Stochastic Design Models**

**Math. 100. Mathematics of Sports—The use of mathematics, statistics, and probability in the analysis of athletic performance, sports records, strategy, etc. Topics: mathematical analysis of the physical and biological aspects of human performance, the effects of variations in technique and equipment, the determination of optimal strategies, traditional sports statistics and the development of new statistics, calculation of probabilities of various outcomes, etc. Different sports are considered. Prerequisite: Mathematics 51. Corequisite: Statistics 116. 3 units (Cover) alternate years, given 2001-02**

**Szego Assistant Professors:**

- Doron Levy
- Kefung Liu
- Gigliola Staffilani
- Amir Dembo
- Renata Kallosh
- Lecturers: Clark Bray, Arnold Kim, Steve Levandosky, Klaus Mohnke, Helen Moore, Baozhang Yang

The Department of Mathematics offers programs leading to the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy in Mathematics and participates in the program leading to the B.S. in Mathematical and Computational Science. The department also participates in the M.S. and Ph.D. degree programs in Scientific Computing and Computational Mathematics.

**ADVANCED PLACEMENT FOR FRESHMEN**

Students of unusual ability in mathematics often take one or more semesters of college-equivalent courses in mathematics while they are still in high school. Under certain circumstances, it is possible for such students to secure both advanced placement and credit toward the bachelor's degree. A decision as to placement and credit is made by the department after consideration of the student's performance on the Advanced Placement Examination in Mathematics (forms AB or BC) of the College Entrance Examination Board. This examination is the only one used for granting credit.

The department does not give its own advanced placement examination. Students can receive either 5 or 10 units of advanced placement credit, depending on their scores on the Advanced Placement Examination. Entering students who have credit for two quarters of single variable calculus (10 units) are encouraged to enroll in Mathematics 51-53 in multivariable mathematics, or the honors version 51H-53H. These three-course sequences, which can be completed during the freshman year, supply the necessary mathematics background for most majors in science and engineering. They also serve as excellent background for major or minor degrees in Mathematics, or in Mathematical and Computational Science. Students who have credit for one quarter of single variable calculus should take Mathematics 42 in the Autumn Quarter and 51 in Winter Quarter. Options available in the Spring Quarter include Mathematics 52, 53, 103, or 130. For proper placement, contact the Department of Mathematics.

**UNIVERSITY REQUIREMENTS**

**BACHELOR OF SCIENCE**

The following department requirements are in addition to the University's basic requirements for the bachelor's degree:

**MAJORS**

Students wishing to major in Mathematics must satisfy the following requirements:

1. Department of Mathematics courses totaling at least 49 units credit; such courses must be taken for a letter grade. For the purposes of this requirement, Statistics 116 counts as a Department of Mathematics course.
2. Additional courses taken from Department of Mathematics courses numbered 100 and above or from approved courses in other disciplines with significant mathematical content, totaling at least 15 units credited.

3. A Department of Mathematics adviser must be selected, and the courses selected under items ‘1’ and ‘2’ above must be approved by that adviser, acting under guidelines laid down by the department’s Committee for Undergraduate Affairs. The Department of Mathematics adviser can be any member of the department’s faculty.

4. To receive the department’s recommendation for graduation, a student must have been enrolled as a major in the Department of Mathematics for a minimum of two full quarters, including the quarter immediately before graduation. In any case students are strongly encouraged to declare as early as possible, preferably by the end of the sophomore year.

Students are normally expected to complete either the sequence 19, 20, 21 or the sequence 41, 42 (but not both). Students with an Advanced Placement score of at least 4 in BC math or 5 in AB math may, if they so choose, take 10 units credit and fulfill requirement ‘1’ by taking at least 39 units of Department of Mathematics courses numbered 51 and above. Students with an Advanced Placement score of at least 3 in BC math or at least 4 in AB math may, if they so choose, take 5 units credit and fulfill requirement ‘1’ by taking at least 44 units of Department of Mathematics courses numbered 42 and above.

It is recommended that the choice of courses under item ‘1’ above should include at least the following: the sequence 51, 52, 53, or the sequence 51H, 52H, 53H (but not both); 104 or 114; 106 or 116; 115 or 171; 120 or both 109 and 110. In addition, it is recommended that students make a reasonably broad selection of courses from the department’s algebra and analysis courses 121, 131, 132, 152, 153, 155, 156, 173, 174A, B (formerly 134A, B), 175, 176, the geometry/topology courses 141, 143, 145, 147, 148, and foundation courses 160A, 160B, 161. The probability course Statistics 116 is also recommended.

Some of the additional courses mentioned under item ‘2’ above could, for example, be taken from the physics series 41, 43, 45, 47, or the physics series 61, 63, 65. A variety of other courses may be allowed under item ‘2’, including some courses taken from the departments of Engineering, Computer Science, Statistics, and Economics.

Subject to approval of the department’s Committee for Undergraduate Affairs, it may, in some cases, be permitted to count freshmen and sophomore seminar courses as part of a choice of courses under item ‘1’. Other variations of the course requirements laid down above (under items ‘1’ and ‘2’) may, in some circumstances, be allowed (for example, students transferring from other universities may be allowed credit for some courses completed before their arrival in Stanford). In all cases, approval must be obtained from the department’s Committee for Undergraduate Affairs. Application for such approval should be made through the student’s Department of Mathematics adviser.

It is to be emphasized that the above regulations are minimum requirements for the major—students contemplating graduate work in mathematics are strongly encouraged to include the courses 114, 120, and 171 in their selection of courses, and in addition, take at least three Department of Mathematics courses over and above the minimum requirements laid out under items ‘1’ and ‘2’ above, including at least one 200-level course. Such students are also encouraged to consider the possibility of taking the honors program, discussed below.

To help develop a sense of the type of course selection (under items ‘1’ and ‘2’ above) which would be recommended for math majors with various backgrounds and interests, see the following examples. These represent only a few of a very large number of possible combinations of courses which could be taken in fulfillment of the Mathematics major requirements:

**Example 1**—A “General” program (a balanced program of both pure and applied components, without any particular emphasis on any one field of mathematics or applications) as follows:

Either Mathematics 19, 20 and 21, or 41 and 42 (or satisfactory Advanced Placement credit); 51, 52, 53; 104; 106; 109; 110; 115

Plus any selection of at least eight of the following courses, including three Department of Mathematics courses (or two math courses and Statistics 116): Mathematics 131, 132, 143, 147, 152, 153, 161, 173; Statistics 116; Physics 41, 43, 45; Computer Science 137; Economics 50

It would be common in this sequence to also include Mathematics 103 or 113 in the selection of Department of Mathematics courses here, especially for students wishing to supplement their knowledge of linear algebra, gained in Mathematics 51 and 53, before attempting some of the other courses listed. However, Mathematics 51 and 53 would generally be deemed sufficient introduction to linear algebra for these other courses. Students could take 103 (or 113) and 130 in lieu of 53.

**Example 2**—A “Theoretical” program (recommended for those contemplating possible later graduate work (see, also, the discussion of the honors program below), providing an introduction to the main areas of mathematics both broader and deeper than the general program outlined above).

Either Mathematics 19, 20, and 21, or 41 and 42 (or satisfactory Advanced Placement credit)

Either the sequence 51, 52, 53, or the sequence 51H, 52H, 53H; 106 or 116; 114; 120; 171

Plus at least nine of the following courses: 121, 131, 132, 141, 143, 145, 147, 148, 152, 153, 155, 156, 160A,B, 161, 173, 174A,B (formerly 134A,B), 175, 176, Statistics 116

In addition, those contemplating eventual graduate work in mathematics should seriously consider including at least one graduate-level math course such as Mathematics 205A or 206A. Such students should also consider the possibility of entering the honors program.

Students taking 51, 52, 53 rather than 51H, 52H, 53H should consider taking 113 before attempting 114.

**Example 3**—An “Applied Mathematics” program:

Either Mathematics 19, 20, 21; or 41 and 42 (or satisfactory Advanced Placement credit); 51, 52, 53; 104; 106; 109; 110; 115; 131; 132; Statistics 116

Plus at least 15 units of courses in Applied Mathematics, including, for example, suitable courses from the departments of Computer Science, Economics, Engineering, and Statistics

* Students with interests in applied mathematics, but desiring a broader-based program than the type of program suggested in Example 3, including significant computational and/or financial and/or statistical components, are encouraged to also consider the Mathematics and Computational Sciences program.

**MINORS**

To qualify for the minor in mathematics, a student should successfully complete, for a letter grade, at least six Department of Mathematics courses numbered 51 or higher, totaling a minimum of 24 units. It is recommended that these courses include either the sequence 51, 52, 53 or the sequence 51H, 52H, 53H.

**HONORS PROGRAM**

The honors program is intended for students who have strong theoretical interests and abilities in mathematics. The goal of the program is to give students a thorough introduction to the main branches of mathematics, especially analysis, algebra, and geometry. Through the honors thesis, students may be introduced to a current or recent research topic, although occasionally more classical projects are encouraged. The program provides an excellent background with which to enter a master’s or Ph.D. program in mathematics. Students successfully completing the program are awarded a B.S. in Mathematics with Honors.

It is recommended that the sequence 51H, 52H, 53H be taken in the freshman year. Students who have instead taken the sequence 51, 52, 53 in their freshman year may be permitted to enter the honors program, but such entry must be approved by the Department of Mathematics Committee for Undergraduate Affairs.

To graduate with a B.S. in Mathematics with Honors, the following conditions apply in addition to the usual requirements for math majors:

1. The selection of courses under items ‘1’ and ‘2’ above must include all the math courses 106 or 116, 114, 120, 171 and also must include
at least two courses from the analysis sequence 131, 132, 173, 174A, 174B (formerly 134A, 134B), 175, 176; at least two courses from the algebra sequence 121, 125, 155, 156; at least one course in the geometry/topology sequence 141, 143, 145, 147, 148; and at least one course in logic or set theory (from 160A, 160B, 161). The probability course Statistics 116 is also strongly recommended.

2. Students in the honors program must write a senior thesis. In order to facilitate this, the student must, by the end of the junior year, choose an undergraduate thesis adviser from the Department of Mathematics faculty, and map out a concentrated reading program under the direction and guidance of the adviser. During the senior year, the student must enroll in Mathematics 197 for a total of 6 units (typically spread over two quarters), and work toward completion of the thesis under the direction and guidance of the thesis adviser. The thesis may contain original material, or be a synthesis of work in current or recent research literature. The 6 units of credit for Mathematics 197 are required in addition to the course requirements laid out under items ‘1’ and ‘2’ above of the usual requirements for math majors.

In addition to the minimum requirements laid out above, it is strongly recommended that students take at least one graduate-level course (that is, at least one course in the 200 plus range). Mathematics 205A, 206A are especially recommended in this context.

Students with questions about the honors program should see the Director of Undergraduate Advising.

**BACHELOR OF SCIENCE IN MATHEMATICAL AND COMPUTATIONAL SCIENCE**

The Department of Mathematics participates with the departments of Computer Science, Management Science and Engineering, and Statistics in a program leading to a B.S. in Mathematical and Computational Science. See the “Department of Mathematical and Computational Science” section of this bulletin.

**GRADUATE PROGRAMS**

**MASTER OF SCIENCE**

The University’s basic requirements for the master’s degree are discussed in the “Graduate Degrees” section of this bulletin. The following are additional department requirements:

- Candidates must complete an approved course program of 36 units beyond the department requirements for the B.S. degree. It must include 18 units in courses numbered 200 or above. The candidate must have a grade point average (GPA) of 'B' over all course work taken in mathematics, and a GPA of 'B' in the 200-level courses considered separately. Course work for the M.S. degree must be approved during the first quarter of enrollment in the program by the department’s Director of Graduate Studies.

For the degree of M.S. in Computer Science, see the “Computer Science” section of this bulletin.

**TEACHING CREDENTIALS**

For information concerning the requirements for teaching credentials, see the “School of Education” section of this bulletin or address inquiries to Credential Secretary, School of Education.

**MASTER OF ARTS IN TEACHING (MATHEMATICS)**

In cooperation with the School of Education, the department offers a program leading to a Master of Arts in Teaching (Mathematics). It is intended for candidates who have a teaching credential or relevant teaching experience and wish to strengthen their academic preparation. Detailed requirements are outlined under the “School of Education, Master of Arts in Teaching” section of this bulletin.

**DOCTOR OF PHILOSOPHY**

The University’s basic requirements for the doctorate (residence, dissertation, examination, and so on) are discussed in the “Graduate Degrees” section of this bulletin. The following are additional department requirements.

To be admitted to candidacy, the student must have successfully completed 27 units of graduate courses (that is, courses numbered 200 and above). In addition, the student must pass qualifying examinations given by the department.

Beyond the requirements for candidacy, the student must complete a course of study of at least 48 units approved by the Graduate Affairs Committee of the Department of Mathematics and submit an acceptable dissertation. The course program should display substantial breadth in mathematics outside the student’s field of application. The student must receive a grade point average (GPA) of ‘B’ or better in courses used to satisfy the Ph.D. requirement. In addition, the student must pass the University oral examination and pass a reading examination in two foreign languages, chosen from French, German, or Russian.

Experience in teaching is emphasized in the Ph.D. program. Each student is required to complete nine quarters of such experience. The nature of the teaching assignment for each of those quarters is determined by the department in consultation with the student. Typical assignments include teaching or assisting in teaching an undergraduate course or lecturing in an advanced seminar.

For the Ph.D. degree in Computer Science, see the “Computer Science” section of this bulletin.

For further information concerning degree programs, fellowships, and assistantships, inquire of the academic associate of the department.

**APPLIED MATHEMATICS OPTION**

This option differs from the standard Ph.D. program in that qualifying examinations in more applied areas are substituted for the regular qualifying examinations. Also, the courses Mathematics 220 (basic methods in partial differential equations) and Computer Science 237 (numerical methods) are a required part of the curriculum in the first year. Students are required to take 18 units of graduate-level courses in computer science and applied areas such as financial mathematics, fluid mechanics, operations research, or statistics.

Ph.D. MINOR

The student should complete both of the following:*  
1. Mathematics 106 or 116, 131, 132  
2. Mathematics 113, 114, 120 or 152  

These courses may have been completed during undergraduate study, and their equivalents from other universities are acceptable.

In addition, the student should complete 21 units of 200-level courses in mathematics. These must be taken at Stanford and approved by the Department of Mathematics’ Ph.D. minor adviser.

* A third coherent sequence designed by the student, subject to the approval of the graduate committee, may be considered as a substitute for items '1' or '2'.

**COURSES**

(WIM) indicates that the course meets the Writing in the Major requirements.

**INTRODUCTORY AND UNDERGRADUATE**

The department offers two sequences of introductory courses in single variable calculus.

1. Mathematics 41, 42 present single variable calculus. Differential calculus is covered in the first quarter, integral calculus in the second.

2. Mathematics 19, 20, 21 cover the material in 41, 42 in three quarters instead of two.

There are options for studying multivariable mathematics:

1. Mathematics 51, 52, 53 cover differential and integral calculus in several variables, linear algebra, and ordinary differential equations. These topics are taught in an integrated fashion and emphasize application. Mathematics 51 covers differential calculus in several variables and introduces matrix theory and linear algebra, 52 covers integral calculus in several variables and vector analysis, 53 studies further topics in linear algebra and applies them to the study of ordi-
nary differential equations. This sequence is strongly recommended for incoming freshmen with 10 units of Advanced Placement credit.

2. Mathematics 51H, 52H, 53H cover the same material as 51, 52, 53, but with more emphasis on theory and rigor. The introductory course in modern algebra is Linear Algebra (103 or 113). There are no formal prerequisites for these courses, but appropriate mathematical maturity is expected. The material in 103 is covered in the sequence 51, 52, 53.

19, 20, 21. Calculus—The content is the same as the sequence 41 and 42 described below, over three quarters rather than two.

19. Calculus—GER:2c (DR:4)
   - 3 units, Aut (Moore)
   - Win (Staff)

20. Calculus—Continuation of 19. Prerequisite: 19. GER:2c (DR:4)
   - 3 units, Win (Moore)
   - Spr (Staff)

21. Calculus—Continuation of 20. Prerequisite: 20. GER:2c (DR:4)
   - 4 units, Spr (Moore)

41, 42.—Three large lecture classes per week plus two classes in small sections.

41. Single Variable Calculus—Introduction to differential and integral calculus of functions of one variable. Topics: review of elementary functions including exponentials and logarithms, rates of change, and the derivative. Prerequisites: algebra, trigonometry. GER:2c (DR:4)
   - 5 units, Aut (Bray)

42. Single Variable Calculus—Continuation of 41. Methods of symbolic and numerical integration, applications of the definite integral, introduction to differential equations. Infinite series. Prerequisite: 41 or equivalent. GER:2c (DR:4)
   - 5 units, Aut (Ni)
   - Win (Bray)

51, 52, 53. Multivariable Mathematics—Recommended for incoming freshmen with 10 units of Advanced Placement credit, and for those interested in science, engineering, or economics. Provides an integrated treatment of multivariable calculus, linear algebra, and ordinary differential equations involving numerical algorithms and computer experiments. Applications are stressed.

51. Linear Algebra and Differential Calculus of Several Variables—Geometry and algebra of vectors, systems of linear equations, matrices, vector valued functions and functions of several variables, partial derivatives, gradients, chain rule in several variables, vector fields, optimization. Prerequisite: completion of 21, 42, or a score of at least 4 on the BC Advanced Placement Examination or 5 on the AB Advanced Placement Examination, or consent of the instructor. GER:2c (DR:4)
   - 5 units, Aut (Brunsfiel, Hutchings, S. Levandosky, Staffalani, White)
   - Win (Kiem, Rubin)
   - Spr (Bray)
   - Sun (Staff)

52. Integral Calculus of Several Variables—Iterated integrals, line and surface integrals, vector analysis with applications to vector potentials and conservative vector fields, physical interpretations. Divergence theorem and the theorems of Green, Gauss, and Stokes. Prerequisite: 51.
   - 5 units, Aut (Wang)
   - Win (Cieliebak, S. Levandosky)
   - Spr (Bump)

53. Ordinary Differential Equations with Linear Algebra—Linear ordinary differential equations, applications to oscillations, matrix methods including determinants, eigenvalues and eigenvectors, matrix exponentials, solving of systems of linear differential equations with constant coefficients, numerical methods, and Laplace transforms. Similar to 130, integrated with topics from linear algebra (103, 104). Prerequisite: 51.
   - 5 units, Aut (Carlton)
   - Win (Schlichtkrull)
   - Spr (J. Levandosky, Etnyre)

51H, 52H, 53H. Honors Calculus—For prospective math majors in the honors program and students from other areas of science or engineering who have a strong mathematics background. Three-quarter sequence covers the material of 51, 52, 53, and additional advanced calculus and ordinary and partial differential equations. Provides a unified treatment of multi-variable calculus, linear algebra, and differential equations with a different order of topics and emphasis from standard courses. Students should know one-variable calculus and have an interest in a theoretical approach to the subject. Prerequisite: score of 5 on BC Advanced Placement Exam, or consent of the instructor. Recommended: complete at least the first two quarters. 51H satisfies GER:2c (DR:4)

51H. 5 units, Aut (Eliashberg)
52H. 5 units, Win (Kerckhoff)
53H. 5 units, Spr (R. Cohen)

83Q. Stanford Introductory Seminar: Introduction to Contact Geometry—Preference to sophomores.
   - 3 units, Win (Eliashberg)

   - 3 units, Win (Carlsson)

   - 3 units, Win (Simon)

   - 3 units, Aut (Katznelson)

   - 3 units, Spr (R. Cohen)

UNDERGRADUATE AND GRADUATE

Unless explicitly stated, there are no prerequisites for the courses listed below. Where a prerequisite is stated, it may be waived by the instructor.

103. Matrix Theory and Its Applications—Linear algebra and matrices, emphasizing the computational and algorithmic aspects and the scientific problems in which matrix theory is applied. Solution of linear equations, linear spaces and matrices. Orthogonal projection and least squares. Determinants, eigenvalues, and eigenvectors. GER:2c (DR:4)
   - 3 units, Aut (Kiem, Mohrke)
   - Win (Levy, Ni)
   - Spr (Kom, Schlichtkrull)
   - Sun (Staff)

   - 3 units, Spr (Ni)

106. Introduction to Theory of Functions of a Complex Variable—Complex numbers, analytic functions, Cauchy-Riemann equations, complex integration, Cauchy formula; elementary conformal mappings. Prerequisite: 52 or 52H.
   - 3 units, Aut (Levy)
   - Sun (Staff)

475
108. Introduction to Combinatorics and Its Applications—Topics: graphs, trees (Cayley’s Theorem, application to phylogony), eigenvalues, basic enumeration (permutations, Stirling and Bell numbers), recurrences, generating functions, basic asymptotics. Prerequisites: Mathematics 51 and 103, or equivalent.  
3 units, Aut (Diaconis)

109. Applied Modern Algebra—Applications of the theory of groups. Topics: elements of group theory, groups of symmetries, matrix groups, group actions, and applications to combinatorics and computing. Applications: rotational symmetry groups, the study of the Platonic solids, crystallographic groups and their applications in chemistry and physics. (WIM)  
3 units, Win (R. Cohen)

110. Applied Number Theory and Field Theory—Introduction to number theory and its applications to modern cryptography. Topics: congruences, finite fields, primality testing and factorization, public key cryptography, error correcting codes, and elliptic curves, with emphasis throughout on algorithms. (WIM)  
3 units, Spr (Rubin)

112. Symmetric Functions and Algebraic Combinatorics—Unified treatment of topics in classical enumeration via the study of symmetric polynomials. Classical symmetric functions, Schur functions, Young tableaux, Schensted correspondence, character theory of the symmetric group, introduction to random matrix theory. Prerequisite: 109 or 120, or equivalent.  
3 units, Win (Diaconis)

113. Linear Algebra and Matrix Theory—Algebraic properties of matrices and their interpretation in geometric terms. The relationship between the algebraic and geometric points of view and matters fundamental to the study and solution of linear equations. Topics: linear equations, vector spaces, linear dependence, bases and coordinate systems; linear transformations and matrices; similarity; eigenvectors and eigenvalues; diagonalization.  
3 units, Aut (Katznelson)  
Win (Hutchings)

114. Linear Algebra and Matrix Theory—Continuation of 113. Deeper study of 113 topics plus additional topics from invariant subspaces, canonical forms of matrices; minimal polynomials and elementary divisors; vector spaces over arbitrary fields; inner products; Jordan normal forms; Hermitian and unitary matrices; multilinear algebra.  
3 units, Win (Milgram)

3 units, Aut (S. Levandosky)  
Win (Ornstein)  
Sum (Staff)

3 units, Win (Eliashberg)

120. Modern Algebra I—Basic structures in algebra: groups, rings, and fields. Elements of group theory: permutation groups, finite Abelian groups, $p$-groups, Sylow theorems. Polynomial rings, principal ideal domains, unique factorization domains. (WIM)  
3 units, Aut (J. Li)

121. Modern Algebra II—Continuation of 120. Fields of fractions. Solvable and simple groups. Elements of field theory and Galois theory. Prerequisite: 120.  
3 units, Win (J. Li)

130. Ordinary Differential Equations—Special, exact, and linear equations; series solutions, numerical solution; Laplace transform; systems of equations. Students with some background in matrix theory should take 53, which integrates linear algebra with differential equations. Pre- or corequisite: 51 or consent of instructor.  
3 units, Aut (Milgram)  
Win (Yang)  
Sum (Staff)

3 units, Win (Papanicolaou)  
Spr (S. Levandosky)

3 units, Spr (Kim)

3 units, Aut (Schoen)

145. Algebraic Geometry—Affine and projective spaces, plane curves, Bézout’s theorem, singularities and genus of a plane curve, applications of commutative algebra to geometry. Prerequisites: 106 and either 120 or 110.  
not given 2000-01

147. Differential Topology—Smooth manifolds, transversality, Sard’s theorem, embeddings, degree of a map, Borsuk-Ulam theorem, Hopf degree theorem, Jordan Curve Theorem. Prerequisite: 115 or 171.  
not given 2000-01

148. Algebraic Topology—Fundamental group, covering spaces, Euler characteristic, classification of surfaces, knots. Prerequisite: 109 or 120.  
3 units, Win (Kerckhoff)

3 units, Win (Lee)

152. Elementary Theory of Numbers—Euclid’s algorithm, fundamental theorems on divisibility; prime numbers, congruence of numbers; theorems of Fermat, Euler, Wilson; congruence of first and higher degrees; Lagrange’s theorem, its applications; residues of power; quadratic residues; introduction to the theory of binary quadratic forms.  
3 units, Spr (Carlson)

153. Combinatorics—Topics in Ramsey’s theorem, generating functions, partition functions, and in number theory (sums of integers and van
der Waerden's theorem). Recommended: general background in algebra, analysis, and some number theory.

not given 2000-01

156. Group Representations—Designed for undergraduates. Experimental, primarily examining symmetries on objects such as vector spaces ("group representations"), geometric objects ("geometric group actions"), and discrete sets (combinatorics). Topics: group representations and their characters, classification of permutation representations using partitions and Young tableaux, group actions on sets and the Burnside ring, and spherical space forms. Prerequisites: basic knowledge of linear algebra (51-53, 103 or 113) and Group Theory (109, 110 or 120).

not given 2000-01

160A. First-Order Logic—(Enroll in Philosophy 160A.)
4 units, Win (Mints)

160B. Computability and Logic—(Enroll in Philosophy 160B.)
4 units, Spr (Mints)

161. Set Theory—Informal and axiomatic set theory: sets, relations, functions and set-theoretical operations. The Zermelo-Fraenkel axiom system and the special role of the axiom of choice and its various equivalents. Well-orderings and ordinal numbers; transfinte induction and transfinte recursion. Equinumerosity and cardinal numbers; Cantor's Alephs and cardinal arithmetic. Open problems in set theory.

3 units, Spr (White)

162. Philosophy of Mathematics—(Enroll in Philosophy 162.)
4 units, Win (Feferman)

171. Fundamental Concepts of Analysis—Recommended for math majors and required of honors math majors. Similar to 115 but altered contents and more theoretical orientation. Properties of Riemann integrals, continuous functions and convergence in metric spaces; compact metric spaces, basic point set topology. Prerequisites: either 51, 52, 53; or 51H, 52H, 53H. (WIM)

3 units, Aut (Kerckhoff)

173. Analysis on Manifolds—Differentiable manifolds, tangent space, submanifolds, implicit function theorem, differential forms, vector and tensor fields. Frobenius' theorem, deRham theory. Prerequisite: 52 or 52H.

3 units, Win (R. Cohen)

174A,B. Honors Analysis—(Formerly 134A,B) Primarily for students planning graduate work in mathematics or physics who would normally enroll in an honors sequence. Required of honors math majors, but of use and interest to other majors at ease with rigorous proofs and qualitative discussion. Coherent, mathematically sophisticated presentation of the basic areas in classical real analysis. Emphasis is on ordinary and partial differential equations. Prerequisite: 53H or 171, or consent of instructor.

174A. 3 units, Win (P. Cohen)
174B. 3 units, Spr (P. Cohen)

175. Elementary Functional Analysis—Linear operators on Hilbert space. Spectral theory of compact operators; applications to integral equations. Elements of Banach space theory. Prerequisite: 115 or 171.

3 units, Spr (Yang)


3 units, Aut (Dembo)

195. Teaching Practicum—Students assist in an undergraduate course, lead problems sessions, and tutor. Some reading in topics in mathematics education is required.

1 unit, Aut, Win, Spr

197. Senior Honors Thesis
1-6 units, Aut, Win, Spr (Staff)

199. Independent Work—Undergraduates pursuing a reading program; topics limited to those not in regular department course offerings. Credit can fulfill the elective requirement for math majors. Approval of Undergraduate Affairs Committee is required to use credit for department's area requirement. Consult the academic advisor for help in finding an adviser.

(Staff)

PRIMARILY FOR GRADUATE STUDENTS

200. Graduate Problem Seminar
not given 2000-01


3 units, Aut (Simon)

Win (P. Cohen)

205C. Topics in Functions of a Real Variable—Introduction to homogenization. Basic theory of elliptic differential equations with oscillating coefficients, their asymptotic properties, use of multiple scale methods, weak and sharp convergence, and applications in analysis and physics. Prerequisite: 205A or equivalent.

3 units, Spr (Papanicolaou)


3 units, Aut (Mazzeo)


3 units, Win (Wang)

210A,B,C. Modern Algebra—Groups, rings, and fields, Galois theory, ideal theory. Introduction to algebraic geometry and algebraic number theory. Representations of groups and non-commutative algebras, multilinear algebra. Prerequisite: 120 or equivalent.

210A. 3 units, Aut (Bump)
210B. 3 units, Win (Bump)
210C. 3 units, Spr (Bump)

216A,B. Introduction to Algebraic Geometry—Affine and projective varieties, schemes, the functor of points, sheaves, sheaf cohomology, Serre duality, Riemann-Roch, algebraic curves. Emphasis is on methods that apply in arithmetic and geometric situations. Prerequisite: 210 or equivalent, or consent of instructor.

216A. 3 units, Win (Carlton)
216B. 3 units, Spr (Carlton)


217A. 3 units, Win (Schoen)
217B. 3 units, Spr (Wang)

220A. 3 units, Aut (J. Levandosky)
220B. 3 units, Win (J. Levandosky)
220C. 3 units, Spr (Mattingly)


222A. 3 units, Aut (Levy)
222B. 3 units, Win (Levy)

226. Capillary Surfaces—Introduction to the modern theory of capillary free surface interfaces in the contexts of differential geometry and the calculus of variations. Emphasis is on the interactions between the formal mathematics and physical reality. Results from NASA space experiments. Topics: global estimates on configuration of solution surfaces, discontinuous dependence of solutions on boundary data, symmetry breaking, criteria for existence, failure of existence under physical conditions, failure of uniqueness under conditions for which solutions exist, etc.

3 units, Win (Pinn)

228. Introduction to Ergodic Theory—Measure preserving transformations and flows, ergodic theorems, mixing properties, spectrum, Kolmogorov automorphisms, entropy theory. Examples. Classical dynamical systems, mostly geodesic and horocycle forms on homogeneous spaces of SL(2,R). Prerequisites: 205A, B.

not given 2000-01

3 units, Aut (Dembo)

3 units, Win (Siegmund)

3 units, Spr (Lai)

231. Point and Spatial Processes—(Enroll in Statistics 317.)
3 units, Win (Diaconis)

233. Probabilistic Methods in Analysis—Proofs and constructions in analysis obtained from basic results in Probability Theory and a "probabilistic way of thinking." Topics: Rademacher functions, Gaussian processes, entropy.

3 units, Win (Katznelson)

234. Large Deviations—(Same as Statistics 374.) Combinatorial estimates and the method of types. Large deviation probabilities for partial sums and for empirical distributions, Cramer's and Sanov's theorems and their Markov extensions. Applications in statistics, information theory, and statistical mechanics. Prerequisite: 230A or Statistics 310.

3 units, Aut (Dembo)

235A, B, C. Selected Topics in Ergodic Theory—Topics from the Kolmogorov-Sinai theory of entropy; the isomorphism theorem for Bernoulli shifts and Bernoulli flows; K-automorphisms applications to mechanical systems, and automorphisms of compact groups.

235A. 3 units, Aut (Ornstein)
235B. 3 units, Win (Ornstein)
235C. 3 units, Spr (Ornstein)


3 units, Win (Mattingly)


3 units, Spr (Papanicolaou)


3 units, Spr (Lee)

241. Mathematical Finance—(Enroll in Statistics 250.)
3 units, Win (T. Lai)

244. Riemann Surfaces—Compact Riemann surfaces: topological classifications, Hurwitz' formula, Riemann-Roch formula, uniformization theorem. Abel's theorem, Jacobian varieties. Some elements of harmonic analysis are developed with applications. Emphasis is on methods which are generally applicable to algebraic curves.

not given 2000-01

245. Topics in Algebraic Geometry—Moduli spaces of algebraic curves and related topics.
3 units, Aut (J. Li)

248. Number Theory—Introduction to algebraic number theory: the arithmetic of local and number fields, and a brief introduction to class field theory. Prerequisite: 210A, B or equivalent.

not given 2000-01

249A. Representations of GL(n) and Automorphic Forms—The representation theory of GL(n) over p-adic fields, with applications to automorphic forms.
3 units, Win (Bump)

249B. Arithmetic of Elliptic Curves—Topics: elliptic curves over local and global fields, the Mordell-Weil theorem, and the Birch Swinnerton-Dyer conjecture.
3 units, Spr (Rubin)

253. Regularity of Sets and Mappings—For students interested in any area of analysis. Topics: Lipschitz functions; C°° functions; Sobolev functions; various regularity and extension theorems including Rademacher, Kirzbraun, Whitney, Sard, C°-Sard. Critical sets of real-analytic, complex analytic functions. Affine approximation properties of subsets of R^d, including a discussion of rectifiability and non-rectifiability, structure theorem, and Reifenberg's topological disc theorem.

not given 2000-01

254A, B. Ordinary Differential Equations—Qualitative theory of ordinary differential equations, analytic and geometric methods. Topics from the stability and perturbation theory of dynamical systems; Hamil-
tonian systems; applications to the theory of oscillations and celestial mechanics.

not given 2000-01


not given 2000-01

257A,B. Symplectic Geometry and Topology—Linear symplectic geometry and linear Hamiltonian systems. Symplectic manifolds and their Lagrangian submanifolds—local properties. Symplectic geometry and mechanics. Contact geometry and contact manifolds. Relations between symplectic and contact manifolds. Hamiltonian systems with symmetries. Momentum map and its properties.

257A. 3 units, Win (Cieliebak)
257B. 3 units, Spr (Cieliebak)

259. Microlocal Analysis—The basic calculus of pseudo-differential operators, focusing on the parametrix construction for elliptic operators, and leading to various applications in geometry (Hodge theorem, index theorem for Dirac operators). Possible topics: pseudo-differential operators on singular and noncompact spaces, the microlocal theory of elliptic boundary value problems, Atiyah-Patodi-Singer index theorem.

not given 2000-01


not given 2000-01


not given 2000-01


263A. 3 units, Win (Milgram)
263B. 3 units, Spr (P. Cohen)


3 units, Win (Papanicolaou)

267A,B. Topics in Functional and Harmonic Analysis—Topics from functional analysis and from the L^p-theory of harmonic analysis—the singular integral theory of Calderon and Zygmund and its extensions, interpolation of operators, multiplier transformations, and smoothness properties of functions. Sets of uniqueness for trigonometric series, spectral syntheses, thin sets, spectral theory of convolution operators, and applications. Prerequisite: knowledge of the elements of Fourier analysis.

267A. 3 units, Aut (Katznelson)
267B. 3 units, Wiu (Katznelson)


not given 2000-01

272A,B. Topics in Partial Differential Equations—Introduction to PDE methods in an intrinsic geometric setting. Topics: Schauder and DeGiorgi-Nash theory in a geometric setting, Sobolev, Poincare, and isoperimetric inequalities. Discussion of nonlinear methods: Leray-Schauder fixed point, and degree and variational methods. Geometric examples introduce basic nonlinear PDEs of geometry (the harmonic map, Yang-Mills, and mean curvature equations) and equations arising from scalar and Ricci curvature. Prerequisite: Knowledge of differential geometry through 217A.

not given 2000-01

277. Mathematical Theory of Relativity—Ricci calculus; variational principles and covariance properties; differential geometry of space-time; Cauchy's problem for the differential equations of gravitation and electromagnetism; relativistic hydrodynamics; unified field theories.

not given 2000-01

281A,B. Introduction to Algebraic and Differential Topology—Fundamental group, covering spaces, embeddings and immersions of manifolds, transversality, homotopy theory, homology and cohomology of complexes, differential forms, Poincare Duality.

281A. 3 units, Aut (Milgram)
281B. 3 units, Win (Hutchings)

282. Low Dimensional Topology—The theory of surfaces and 3-manifolds. Curves on surfaces, the classification of diffeomorphisms of surfaces, and Teichmuller space. The mapping class group and the braid group. Knot theory, including knot invariants. Decomposition of 3-manifolds: triangulations, Heegaard splittings, Dehn surgery. Loop theorem, sphere theorem, incompressible surfaces. Geometric structures, particularly hyperbolic structures on surfaces and 3-manifolds.

3 units, Aut (Kerckhoff)


3 units, Spr (R. Cohen)

283. Topics in Algebraic Topology—Etale homotopy theory. Cech homotopy theory, etale coverings, Grothendieck's theory of the fundamental group of a scheme, etale homotopy type as a pro-space, comparison with the complex topology. Applications to K-theory, homotopy theory, and algebraic geometry.

3 units, Spr (Carlsson)
285. Geometric Measure Theory—Hausdorff measures and dimensions, area and co-area formulas for Lipschitz maps, integral currents and flat chains, minimal surfaces and their singular sets. 

3 units, Spr (White)

286. Topics in Differential Geometry 

3 units, Aut (Schoen, Yang)

289. 3-Dimensional Contact Geometry—Contact structures and foliations, geometric meaning of integrability, tight and overtwisted contact structures, classification of overtwisted contact structures, contact convexity, classification and finiteness results for tight contact structures, holomorphic methods in contact geometry, Legendrian and transversal knots.

3 units, Aut (Eliashberg)

290B. Model Theory—Kripke (possible world) semantics of intuitionistic and modal logics. Completeness results and strategies in automated deduction. Algebraic models. Second order systems. May be taken independently of 290A. Prerequisites: 160A,B or equivalent.

not given 2000-01


291A. 3 units, Aut (Feferman) 
291B. 3 units, Win (Feferman)

292A,B. Set Theory—The basics of axiomatic set theory; the systems of Zermelo-Fraenkel and Bernays-Gödel. Topics: cardinal and ordinal numbers, the cumulative hierarchy and the role of the axiom of choice. Models of set theory, including the constructible sets and models constructed by the method of forcing. Consistency and independence results for the axiom of choice, the continuum hypothesis and other unsettled mathematical and set-theoretical problems. Prerequisites: 160A,B and 161, or equivalents.

not given 2000-01

293A,B. Proof Theory—Gentzen’s natural deduction and/or sequential calculi for first-order predicate logic. Normalization respectively cut-elimination procedures. Extensions to infinitary calculi; ordinal complexity of proof trees. Subsystems of analysis and their reduction to constructive theories. Prerequisites: 160A,B and 162, or equivalents.

293A. 3 units, Aut (Schwichtenberg) 
293B. 3 units, Win (Mints)


3 units, Spr (Mints)

297. Algebraic Logic—(Enroll in Computer Science 353.) 

3 units, Aut (Pratt)

360. Advanced Reading and Research 

any quarter (Staff)

361. Seminar Participation—Participation in a faculty-led seminar which has no specific course number. 

any quarter (Staff)

380. Seminar in Applied Mathematics 

by arrangement

381. Seminar in Analysis 

by arrangement

383. Seminar in Function Theory 

by arrangement

385. Seminar in Abstract Analysis 

by arrangement

386. Seminar in Geometry and Topology 

by arrangement

387. Seminar in Algebra and Number Theory 

by arrangement

388. Seminar in Probability and Stochastic Processes 

by arrangement

389. Seminar in Mathematical Biology 

by arrangement

391. Seminar in Logic and the Foundations of Mathematics

MEDITIVAL STUDIES

Chair: Philippe Buc
Committee in Charge: George Brown, Philippe Buc, Hester Gelber, William Mahrt, Jennifer Summit
Affiliated Faculty: George H. Brown (English), Philippe Buc (History), Brigitte Cazelles (French and Italian), Charlotte Fonrobert (Religious Studies), Hester Gelber (Religious Studies), Nancy S. Kollmann (History), Seth Lerer (English), Suzanne Lewis (Art and Art History), William Mahrt (Music), Jeffrey P. Mass (History), Kathryn Miller (History), Sara S. Poor (German Studies), Orrin W. Robinson (German Studies), Jeffrey Schnapp (French and Italian, Comparative Literature), Jennifer Summit (English), Rega Wood (Philosophy)

The Medieval Studies Program is administered through Interdisciplinary Studies in Humanities, but the degree is conferred by the Dean of Undergraduate Studies' Advisory Committee on Individually Designed Majors. The committee has approved the program as listed below. Students interested in pursuing the Medieval Studies major or minor should consult the Chair of Medieval Studies. Students who are members of the Humanities Honors Program may petition to major in Medieval Studies; see the "Interdisciplinary Studies in Humanities" section of this bulletin. The major is normally declared by the beginning of the student’s third year.

The major combines interdisciplinary breadth with a disciplinary focus. The interdisciplinary emphasis is provided by Medieval Studies 165, Introduction to Medieval Culture, by upper-level interdisciplinary colloquia, and by the requirement that students take courses in three different areas. Depth is ensured by the requirement that students take at least four courses in one area. A faculty adviser helps each student choose courses that integrate the requirements of breadth and depth. To that end, the following guidelines are provided:

The student should take a minimum of ten courses dealing directly with the Middle Ages and distributed as follows:
1. The introductory course, Medieval Studies 165, Introduction to Medieval Culture.
2. Two upper-division courses, ideally with an interdisciplinary component, in any field.
3. Four courses in one of the following categories:
   a. Literature—English, French, German and Scandinavian, Italian, Latin, Slavic, Spanish
b. History
c. Art history, drama, music
d. Humanities, philosophy, religious studies (certain Humanities courses may fulfill requirements within other categories)

4. Two courses in a second category from the above list.
5. One course in a third category from the above list.

In addition to the ten courses, a language proficiency equal to two years of college-level study is suggested in Latin or one of the following: French, German, Italian, or Spanish.

Medieval Studies has a Writing in the Major (WIM) requirement. It can be fulfilled in one of three ways:
1. Through a course designated as WIM by a department contributing to the Medieval Studies major.
2. Through a paper in a Medieval Studies course
3. Through an independent paper with a member of the Medieval Studies faculty.

Check with the program office regarding specific requirements for each of these options.

MINORS

An undergraduate minor in Medieval Studies is available through the program. Students interested in completing the minor should inquire about enrollment procedures at the office of Interdisciplinary Studies in Humanities.

Requirements are as follows:
1. Language: in addition to the University foreign language requirement, at least a one-quarter course in a classical and/or medieval vernacular language is recommended, which may count as one of the five required courses for the minor listed under item 2a.
2. The minor consists of six courses, which include:
   a) Medieval Studies 165, Introduction to Medieval Culture (core course, given annually)
   b) An additional five courses dealing directly with the Middle Ages. If the student’s major department or program offers medieval courses, he/she should take two of them for the Medieval Studies minor, but those courses may not also count for the major. At least three courses must be taken outside the student’s major, selected from two or more of the following categories:
      1) Language and literature
      2) History
      3) Art history, drama, music
      4) Humanities, philosophy, religious studies
      5) From among the Medieval Studies faculty listed above, the student chooses an adviser, who assists in the selection of courses and the design of the program.

Courses applied to the minor in Medieval Studies must be taken for a letter grade. Courses applied to the minor cannot also be applied to a student’s major or another minor.

COURSES

165. Introduction to Medieval Culture—(Same as English 165 A, History 105A.) Introduction to the development of medieval culture through religious, philosophical, literary, artistic, social, and political sources, with emphasis on the interrelationships among them. Lectures by faculty from various departments. GER:3a (DR:7 or 8)
3 units, Win (Brown, Miller)

RELATED AREAS

Courses suitable for self-designed majors in Medieval Studies are listed below. More detailed course descriptions are found under the various department headings. See quarterly Time Schedule for changes in listings.

ART AND ART HISTORY

107A. Early Russian Art and Architecture, 1050-1725

ENGLISH

65B/165B. Arthurian Literature
81Q. Stanford Introductory Seminar: Women and Authority in the Middle Ages
171. Chaucer
205. Old English
211. Readings in Middle English
301A. Colloquium: Cultures of the Medieval Book
371. Seminar: Chaucerian Inheritances—The Production of Literary Authority

FRENCH AND ITALIAN

FRENCH

108N. Stanford Introductory Seminar: Female Saints—The Rhetoric of Religious Perfection
185E. The Dawn of a New Vision: The Evolution of Scientific and Philosophical Thought from the Late Middle Ages to the Western Renaissance (1000-1500)
205. Introduction to Old French Literature

ITALIAN

127. Framing Italian History

GERMAN STUDIES

134P. Medieval Women
161N. Stanford Introductory Seminar: The Arthurian Legend in Literature and Film
257. Gothic

HISTORY

13. The Emergence of Modern Medicine
24A. Ten Days that Shook the World
32S. Sources and Methods Seminar: The Psychology of Warfare—“Just War” in the Middle Ages
100A. Europe from Late Antiquity to 1500
110. Storming Heaven: Christianity in Conflict in Early Modern Europe
119. Aristocracies and Absolutism: Early Modern Eastern Europe, 1400-1800
185. Introduction to Islamic Civilization
192A. Chinese History to the 13th Century
194A. Japan from Earliest Times to 1560
207/307. Undergraduate/Graduate Colloquium: Jews, Christians, and Muslims—Medieval Spain
209B/309B. Undergraduate/Graduate Colloquium: Crusades, Pilgrimages, and Voyages of Discovery—The Expansion of Medieval Europe
MODERN THOUGHT AND LITERATURE

Chair: David Palumbo-Liu

Affiliated Faculty: Lanier Anderson (Philosophy), Anthony Antonio (Education), Joel Beinin (History), Brett Bourbon (English), Scott Bukatman (Art and History), Rudy Busto (Religious Studies), Albert Camarillo (History), Terry Castle (English), George Dekker (English), Paulla Ebron (Cultural and Social Anthropology), Harry Elam (Drama), Jay Fliegelman (English), Claire Fox (Spanish and Portuguese), George Fredrickson (History), Richard Ford (Law), Theodore Glasser (Communication), Hans U. Gumbrecht (French and Italian, Spanish and Portuguese, Comparative Literature), Akhil Gupta (Cultural and Social Anthropology), David Halliburton (English), Shirley Heath (English, Linguistics), Karen Kenkel (German Studies), Miyako Inoue (Cultural and Social Anthropology), Pamela Lee (Art and History), Timothy Lenoir (History), Herbert Lindenberger (English, Comparative Literature), Purnima Mankekar (Cultural and Social Anthropology), Diane Middlebrook (English), Paula Moya (English), Valentin Mudimbe (French and Italian, Comparative Literature), David Palumbo-Liu (Comparative Literature), Robert Polhemus (English), Mary Pratt (Spanish and Portuguese, Comparative Literature.), Arnold Rampersad (English), Renato Rosaldo (Cultural and Social Anthropology), Ramón Saldívar (English, Comparative Literature), Debra Satz (Philosophy), Jeffrey Schnapp (French and Italian, Comparative Literature), Peter Stansky (History), Michael Thompson (History), Elizabeth Traugott (Linguistics, English), Robert Weisberg (Law), Sylvia Yanagisako (Cultural and Social Anthropology), Yvonne Yarbo-Bejarano (Spanish and Portuguese), Richard White (History)

The Program in Modern Thought and Literature is administered through the office of Interdisciplinary Studies in Humanities. The program admits students for the Ph.D. and a very limited number for a coterminal A.M. Program.

UNDERGRADUATE PROGRAMS

Although Modern Thought and Literature has no formal undergraduate degree-granting program, undergraduate students who are interested in completing a major in this field may do so through the undergraduate major in Interdisciplinary Studies in Humanities (see that section of this bulletin). This undergraduate program is designed for students with a strong commitment to interdisciplinary study in the various humanities. Students may devise majors that incorporate modern literature (since the 18th century), cultural history, and critical theory. Students may also create majors in cultural studies, film studies, performance studies, popular culture, history of representation, politics and literature, etc. For specific course guidelines, see the undergraduate Handbookfor the Major in Interdisciplinary Studies in Humanities. Students wishing to declare the major in Interdisciplinary Studies in Humanities must apply for admission to the Humanities honors program and for graduation with honors in Humanities.

COTERMINAL PROGRAM

Each year, one or two undergraduate students, who are exceptionally well-prepared in literature and at least one foreign language and whose undergraduate course work includes a strong interdisciplinary component, may petition to be admitted to the program for the purpose of completing a coterminal A.M. degree. Admission to this program is granted only on condition that in the course of working on their master's degree they do not apply to enter the Ph.D. program in Modern Thought and Literature. The deadline for application is March 1.

To apply, applicants submit:

1. An unofficial grade transcript from AXESS.
2. A “Petition for Admission to the Coterminal Program” from Degree Progress, in the Registrar’s Office.
3. A statement giving the reasons why the student could not pursue the studies he or she desires in some other way.
4. A plan of study listing, quarter by quarter, each course by name, units, and instructor to be taken in order to fulfill the requirements for the degree, including 361, at least 20 units of advanced work in one liter-
GRADUATE PROGRAMS

The Ph.D. in Modern Thought and Literature is an interdisciplinary program combining work in modern literary/cultural studies with work in one or more other modern disciplines.

The Ph.D. program is designed specifically for students who have a strong interest in literature or culture, but whose approach or focus requires an interdisciplinary program—for example, students interested in anthropological or philosophical approaches to literature and culture; gender studies; ethnic studies; or in topics such as legal humanities, popular culture, and social or cultural theory.

Modern Thought and Literature is intended for students who plan to teach and write in literature departments or in interdisciplinary programs in the humanities, cultural studies, or humanistic social sciences, or for students intending to formulate cultural policy.

Course work in the program is divided about evenly between advanced courses in literature departments and advanced courses in non-literary departments.

MASTER OF ARTS

The Master of Arts is available to students who are admitted to the doctoral program. Students are not admitted into the program for the purpose of earning a terminal Master of Arts degree. Candidates for the M.A. must satisfy the committee of their progress and satisfactorily complete 45 units of course work forming a coherent program of study, may apply for an A.M. in Modern Thought and Literature.

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. are discussed in the “Graduate Degrees” section of this bulletin.

A candidate for the Ph.D. degree in Modern Thought and Literature must complete three years (nine quarters) of full-time work, or the equivalent, in graduate study beyond the A.B. degree. He or she is expected to complete at least 18 courses of graduate work in addition to the dissertation. At least three consecutive quarters of graduate work must be taken at Stanford. Students may spend one year of graduate study abroad.

Requirements for the Ph.D. in Modern Thought and Literature are:

1. An introductory seminar (361), The Modern Tradition (5 units, autumn) followed by 361B, The Modern Thought and Literature Colloquium (1 unit, winter).
2. Nine courses of advanced work in literary studies in one language. Of the nine courses, at least six must be regularly scheduled courses in literary studies focused on the period from 1750 to the present, of which at least two must be regularly scheduled seminars. Courses in the teaching of composition (English 396, 397), ad hoc graduate seminars (395), research courses (398), and thesis registration (802) may not be counted among these six courses; 396, 397, 399, 802 may not be counted toward these requirements under any circumstances.
3. Eight courses of advanced work in non-literature departments, the core of which is completion of either a departmental minor or an interdepartmental concentration, typically consisting of six courses. Department minors are available from the departments of Anthropology, Art and Art History, Communication, History, Philosophy, Political Science, Religious Studies, and Sociology (see the relevant information in those sections of this bulletin). Approved interdepartmental concentrations have been established in popular culture, ethnic studies, feminist and gender studies, and science and technology studies (specific course requirements are available from the program office). Individually designed concentrations may be approved by petition to the director. In addition to the required six courses in a minor or a concentration, two additional courses from non-literature departments are chosen in consultation with each student’s academic adviser. Course restrictions noted above in item ‘2’ also apply.
4. Qualifying Paper: this certifies that students are likely to be able to undertake the quality of research, sustained argumentation, and cogent writing demanded in a doctoral dissertation. Qualifying papers should embody a substantial amount of independent research, develop an intellectual argument with significant elements of original thinking, and demonstrate the ability to do interdisciplinary work.

Each paper is evaluated by two or three readers (designated before the end of the first year of graduate study), one of whom must be a member of the Committee in Charge. Qualifying papers must be submitted to the program office no later than the end of the third week of the fifth quarter of enrollment, normally, winter of the second year.
5. Teaching, an essential part of the program, is normally undertaken in conjunction with the Department of English. Candidates are required to demonstrate competence in teaching.
6. Students must demonstrate, by the end of the third quarter of the first year, a reading knowledge of one foreign language and, by the beginning of the first quarter of the third year, a reading knowledge of one other foreign language. Reading knowledge means the ability to make a genuine scholarly use of the language: that is, to read prose of ordinary difficulty.

Students may not take the University oral examination before completion of the foreign language requirement.
7. Candidacy: at the end of the second year, students apply for candidacy. The following qualifications are required before candidacy can be certified: the earlier submission of a satisfactory qualifying paper, demonstration of a reading knowledge of one foreign language; satisfactory progress in course work; a list of courses applicable to the degree, distinguishing between courses appropriate to the literary component and courses appropriate to the interdisciplinary component; and the submission of a statement outlining the scope and coherence of the interdisciplinary component of the program in relation to the literary component and noting the relevance of the course work to that program.
8. Annual Review: the program and progress of each student must be approved by the Committee-in-Charge at the end of each academic year.
9. University Oral Examination: this examination, covering the student’s areas of concentration, normally is taken in the third year of graduate study. It is a two-hour oral examination administered by four faculty members specializing in the student’s areas of concentration, and a chair from another department. The exam is based on a substantial reading list prepared by the student in conjunction with the faculty committee and designed to cover the areas of expertise pertinent to the student’s dissertation project.
10. Colloquium on the Dissertation Proposal: several weeks after the University oral examination, or in conjunction with that examination, the dissertation committee assembles for up to one hour to discuss the dissertation proposal with the student. Prior to this meeting, the student should have consulted each member of the committee to discuss the proposal and compile a bibliography.
11. Dissertation: the fourth year is devoted to the dissertation, which should be a substantial and original contribution acceptable to the Committee on Modern Thought and Literature. The subject is drawn from the literature of specialization and the area of non-literary studies.
HUMANITIES

The program participates in the Graduate Program in Humanities leading to a joint Ph.D. degree in Modern Thought and Literature, and Humanities. For a description of the Humanities program, see “Interdisciplinary Studies in Humanities” section of this bulletin.

COURSES

The courses listed below are specifically sponsored by the Program in Modern Thought and Literature or are required for the doctoral program. For literature courses, students should consult the listings of the various literature departments at Stanford. For other offerings, students should consult listings in the individual departments of interest. Consent of instructor is often required.

Students in the doctoral program in Modern Thought and Literature are advised to read through the offerings in the Department of English (or in their foreign literature of choice) as well as offerings of the non-literature departments in which they wish to concentrate: for example, courses dealing with culture listed under Cultural and Social Anthropology, courses dealing with film under Communication or Art and Art History, courses in intellectual and cultural history under History. If the area of nonliterary interest is thematic rather than disciplinary, doctoral students should look under various program listings, such as Feminist Studies, African and African American Studies, or Comparative Studies in Race and Ethnicity.

7SP/175P. Modern South Asia: History, Society, Cultures—(Enroll in Cultural and Social Anthropology 75/175, History 186A.)

5 units, Win (Mancall, Pandya)

175. Individual Work—Directed reading or research for undergraduates. Individual work does not count towards unit requirements for the undergraduate major in Interdisciplinary Studies in Humanities.

2-5 units, any quarter (Staff)

190P. Sex and Gender in Classical Hollywood Cinema: Making Woman Asian—(Enroll in Feminist Studies 140S.)

5 units, Spr (Parreñas)

190W. Humanism, Anti-Humanism, Posthumanism—Surveys critiques of humanism central to contemporary cultural studies, literary studies, philosophy, and political theory, approaching Western thought as a series of appropriations of an imagined Hellenistic past. The post-WW II response to fascism and the links made between humanism, colonialism, and fascism by progressive scholars and philosophers. How concepts of the human are changing at the nexus of poststructuralism, technoscience, and contemporary socio-political movements. Readings: Plato, More, Bacon, Marx, Nietzsche, Forster, Homi Bhabha, Heidegger, Adorno, Foucault, Derrida, Haraway, Deleuze and Guattari, Trinh Minh-ha, Rey Chow.

5 units, Spr (Weinstein)

261B. Theories of the Postcolonial—(Enroll in Cultural and Social Anthropology 261B.)

5 units, Spr (Pandya)

361. Graduate Colloquium: The Modern Tradition—(Same as Comparative Literature 361C.) Methodological issues regarding the interdisciplinary study of society and culture. How different disciplines have approached ideas of modernity and postmodernity, their particular methodological rationales, debates within disciplines, and, how interdisciplinary work might take place in the interstices of traditional disciplines. Prerequisite: first- or second-year MTL graduate students, or consent of instructor.

5 units, Aut (Palmumbo-Liu)

361B. Modern Thought and Literature Colloquium—Required of first-year graduate students in the program; others by consent of instructor. Weekly meeting of students in the program discusses current scholarship and issues. Presentations by affiliated faculty and by student panels.

1 unit, Win (Palmumbo-Liu)

395. Ad Hoc Graduate Seminars—Graduate students (three or more) who wish to study a subject or an area not covered by regular courses and seminars may plan an informal seminar and approach a suitable member of the faculty to supervise it.

any quarter

396L. Laboratory in Pedagogy—(Enroll in English 396L.) Required for first-year Ph.D. students in English, Modern Thought and Literature, and Comparative Literature (except for students doing their teaching in a foreign language). Preparation for TA in undergraduate literature courses. Focus is on leading discussions and grading papers.

2 units, Aut (Staff)

398. Research Course—Students pursue a special subject of investigation under supervision of a member of the committee or another faculty member. Thesis work is not to be registered under this number.

any quarter

AFFILIATED DEPARTMENT OFFERINGS

The following courses, offered in 2000-01 by faculty on the Committee in Charge of Modern Thought and Literature, may be of interest to students in the program. Course descriptions can be found in the sponsoring department’s section of the Stanford Bulletin. This is not by any means an inclusive list of courses that can be applied to Modern Thought and Literature. The list is merely intended to provide information about the breadth of interest of faculty who are on the Committee in Charge, thereby showing the interdisciplinary nature of the program.

COMMUNICATION

125/225. Perspectives on American Journalism

(Glasser)

131/231. Media Ethics and Responsibility

(Glasser)

333G. Seminar in Communication and Culture

(Glasser) not given 2000-01

COMPARATIVE LITERATURE

24Q. Stanford Introductory Seminar: Ethnicity and Literature

(Palmumbo-Liu)

115Q. Stanford Introductory Seminar: Thinking in the Present—Discussions about 20th-Century European Philosophy

(Gumbrecht)

168. Introduction to Asian American Culture

(Palmumbo-Liu)

202. Comparative Ethnic Autobiography

(Palmumbo-Liu)

325. Politics and Culture

(Palmumbo-Liu)

369E. The Disciplines of Literature

(Gumbrecht, Schnapp)

395A. Philosophical Reading Group

(Gumbrecht)

CULTURAL AND SOCIAL ANTHROPOLOGY

94. Postfield Research Seminar

(Rosaldo)
150C. Introduction to Chicana/o Life and Culture  
(Rosaldo, Yarbro-Bejarano)

210. Reading Theory through Ethnography  
(Rosaldo)

GERMAN STUDIES

133. 20th-Century Literature and Culture: German Modernism  
(Kenkel)

167N. Stanford Introductory Seminar: German Film to 1945  
(Kenkel)

171A. Feminist Media Theories  
(Kenkel)

279. Naturalism  
(Kenkel)

HISTORY

18N. Stanford Introductory Seminar: Confronting Islam—The United States in the Middle East since 1967  
(Beinin)

150A. African-American History to the 20th Century  
(M. Thompson)

165B. 19th-Century America  
(White)

187B. The Middle East in the 20th Century  
(Beinin)

250. Undergraduate Colloquium: American Popular Culture  
(M. Thompson)

255A. Undergraduate Colloquium: Culture and Ideologies of Race  
(M. Thompson)

262S. Undergraduate Research Seminar: Science and High Technology in Silicon Valley, 1930-1980  
(Lenoir)

270S. Undergraduate Research Seminar: North American Wests  
(White)

274A. Undergraduate Colloquium: Body Works—Medicine, Technology, and the Body in Late 20th-Century America  
(Bender, Lenoir, Taylor)

286/386. Undergraduate/Graduate Colloquium: Economic and Social History of the Modern Middle East  
(Beinin)

288/388. Undergraduate/Graduate Colloquium: Palestine and the Arab-Israeli Conflict  
(Beinin)

458,458A. Graduate Seminar: Environmental History  
(R. White)

SPANISH AND PORTUGUESE

110N. Stanford Introductory Seminar: Introduction to Chicana/o Literature and Visual Art  
(Tarbro-Bejarano)

112N. Stanford Introductory Seminar: The U.S.-Mexico Border Region in Film and Literature  
(Fox)

161. Latin American Literature  
(Fox)

180E. Introduction to Chicana/o Cultural Studies  
(Rosaldo, Yarbro-Bejarano)

298. Senior Seminar: Pan-American Movements  
(Fox)

369. The U.S.-Mexico Border Region  
(Fox)

380E. Critical Concepts in Chicana/o Literature  
(Yarbro-Bejarano)

MUSIC

Chair: Thomas Grey  
Professors: Karol Berger, Brian Ferneyhough, Jonathan Harvey (Winter)  
Assistant Professors: Mark Applebaum, Heather Hadlock (on leave 2000-01), Melissa Hui (on leave 2000-01), Tobias Pfeubuch  
Professor (Research): Max V. Mathews  
Associate Professors (Teaching): George Barth (Piano), Stephen Sano (Director of Choral Studies)  
Associate Professor (Performance): Karla Lemon (Director of Orchestras)

Senior Lecturers: Stephen Harrison (Violoncello), Gennady Kleyman (Violin, Viola), Jennifer Lane (Voice), Gregory A. Wait (Voice), Frederick R. Weidly (Piano)

Lecturers: Giancarlo Aquilanti (Theory, Symphonic Band), Talya Berger (Theory), Fredrick Berry (Jazz Ensemble), Frances Blaisdell (Flute), Mark Brandenburg (Clarinet), Marjorie Chauvel (Harp), Robert Claire (Baroque Flute), Floyd O. Cooley (Tuba), Laura Dahl (Resident Collaborative Pianist), John Dornenburg (Viola da Gamba), Charles A. Ferguson (Guitar), Claire Giovannetti (Voice), Dawn Harms (Violin), Alexandra Hawley (Flute), Robert Hubbard (Oboe), Joyce Johnson-Hamilton (Trumpet), Jay Kadi (Audio Recording), McDowell Kenley (Trombone), Fernando Lopez-Lezcano (CCRMA), Janet Maestre (Flute), Anthony Martin (Baroque Violin), James Matheson (Oboe), John McGinn (Theory), Robert H. Morgan (Organ), Bruce Moyer (Contrabass), Herbert Myers (Early Winds), James Nadel (Jazz), Rufen Olivier (Bassoon), Larry S. Ragent (French Horn), Malcolm Slaney (CCRMA), Harold Stein (Saxophone), Frank Sumares (Jazz Piano), Elaine Thornburgh (Harpsichord), Linda Uyechi (Taiko), Mark Veregge (Percussion), Timothy Zerlang (Piano)

Artists in Residence (St. Lawrence String Quartet): Marina Hoover (Cello), Geoff Nuttall (Violin 1), Lesley Robertson (Viola), Barry Shiffman (Violin 2)

Acting Assistant Professor: Jane Alden  
Consulting Professors: Marina Bosi (Computer Research in Music and Acoustics), Walter Hewlett (Computer-Assisted Research in the Humanities), Eleanor Selfridge-Field (Computer-Assisted Research in the Humanities)

Visiting Professor: John R. Pierce (emeritus)

Mellon Fellow: David Code

The Department of Music's aims are to provide specialized training for those who plan careers in music as composers, performers, teachers, and research scholars; and to promote the understanding and enjoyment of music in the University at large through its courses and abundant performance offerings.
Varied opportunities for instrumental and vocal study and performance are available to majors and nonmajors alike. Students wishing to obtain individual instruction, to participate in chamber music, or to play in department ensembles should note that auditions are held during registration week in Autumn Quarter. While there may be openings in some private studios for qualified students during other quarters, it is to the student’s advantage to audition in autumn, as most slots are filled for the entire year.

The department is housed in Braun Music Center, Dinkelspiel Auditorium, and The Knoll, including two theaters for concert and recital productions, two rehearsal halls, and a small chamber hall. Pianos, organs, harpsichords, and a variety of early stringed and wind instruments are available for student use. In addition, advanced students may use fine old stringed instruments and bows from the Harry R. Lange Historical Collection.

The Music Library contains a comprehensive collection of complete editions, scores, books, and recordings. Supplementing this is the Stanford Memorial Library of Music, an invaluable collection of musical manuscripts and first editions, and the Archive of Recorded Sound.

For more information on the Department of Music, see the Music home page (http://www.stanford.edu/group/Music/).

The Doris B. Townsend Center for Computer Research in Music and Acoustics (CCRMA) provides one of the top-rated facilities for digital sound research in the world. It includes a large distributed computing facility, recording, and editing studio; MIDI-based small-systems studios; and work areas with audio-related peripherals. CCRMA software consists of a vast set of programs and system tools for editing, viewing, synthesizing, and analyzing sound. For a detailed and up-to-date description of the hardware and software available, contact the CCRMA office, or see their home page (http://ccrma-www.stanford.edu).

The Center for Computer-Assisted Research in the Humanities (CCARH), located in Braun Music Center, conducts research focused on constructing computer databases for music and on creating programs that allow student and staff researchers to access, analyze, print, and electronically perform the music. For more information, see their home page (http://ccrma-www.stanford.edu/ccarh).

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The undergraduate major in Music is built around a series of foundation courses in theory, musicianship, and music history, in addition to performance and the proficiency requirements outlined below. Because of the sequence of courses, it takes more than two years to complete the requirements for the major. Prospective majors are urged to consult the undergraduate student-services officer in the department as early as possible in order to plan a program which allows sufficient time for major course work, practice, and University requirements outside the major.

The specialization in Music, Science, and Technology is designed for those students with a strong interest in the musical ramifications of rapidly evolving computer technology and digital audio, and in the acoustical and psychoacoustic foundations of music. The program entails a research project under faculty guidance and makes use of the highly multidisciplinary environment at CCRMA. This program can serve as a complementary major to students in the sciences and engineering.

1. Students are required to include the following foundation courses in their programs:
   a) Theory: Music 21, 22, 23
   b) History: Music 40, 41, 42, and three from the series 140-145
   c) Analysis: Music 121 and two from 122A,B,C

2. Additionally, music majors must fulfill the following two performance requirements:
   a) Individual studies in performance: five quarters.
   b) Ensemble: five quarters of work in one or more of the department’s organizations or chamber groups. Music 157 (Mariachi Band) does not satisfy this requirement.

3. Majors are required to pass a Piano Proficiency examination as a part of the requirements to complete Music 23. Offered at the end of the Autumn and Spring quarters or at other times by appointment, it consists of scales and arpeggios, performance of a simple tune (to be set by the examiner), sight reading, and the performance of prepared pieces (consult the Music office for details). Remedial skills are taught in Music 12A,B,C. The successful completion of this examination is a prerequisite for all higher-level theory and analysis courses (Music 121, 122A,B,C).

4. Majors must also pass an Ear Training Proficiency examination, which is part of the requirements to complete Music 23 or can be taken by arrangement, demonstrating a student’s ability to hear music accurately and to perform it at sight. The successful completion of the examination is a prerequisite for all higher-level theory and analysis courses (Music 121, 122A,B,C).

RECOMMENDED SCHEDULE FOR THE MUSIC MAJOR

The following sample schedule shows how a student may include substantial work on a major in music while also fulfilling the University General Education Requirements during the freshman and sophomore years. The schedule also includes foreign language study, which is strongly recommended for all music majors and especially for those expecting to continue into graduate work in any area of music.

**FIRST YEAR**

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<tr>
<th>Course No. and Subject</th>
<th>A</th>
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<tr>
<td>Freshman English</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Music 19 (if needed)</td>
<td>(3)</td>
<td>4</td>
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<tr>
<td>Individual instruction</td>
<td>1-4</td>
<td>1-4</td>
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<tr>
<td>and/or Ensemble</td>
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<td>1-4</td>
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<tr>
<td>Introduction to the Humanities</td>
<td>3-5</td>
<td>3-5</td>
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<tr>
<td>Choice of Foreign Language, General Education Requirement,</td>
<td>3-5</td>
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<tr>
<td>stanford Introductory Seminar</td>
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**SECOND YEAR**

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<th>Course No. and Subject</th>
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<tr>
<td>Music 23, 40-41, 121-42</td>
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<tr>
<td>Individual Instruction</td>
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<td>and/or Ensemble</td>
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<td>General Education Requirement,</td>
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<td>stanford Introductory Seminar</td>
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<tr>
<td>Elective</td>
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**THIRD AND FOURTH YEARS**

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<th>Course No. and Subject</th>
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<tr>
<td>Three from Music 140-145 and two from 122A, B, or C</td>
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<tr>
<td>Elective</td>
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<tr>
<td>Music, Science, and Technology</td>
<td>(4)</td>
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**MUSIC, SCIENCE, AND TECHNOLOGY**

The specialization in Music, Science, and Technology is designed for those students with a strong interest in the musical ramifications of rapidly evolving computer technology and digital audio, and in the acoustical and psychoacoustic foundations of music. The program entails a research project under faculty guidance and makes use of the highly multidisciplinary environment at CCRMA. This program can serve as a complementary major to students in the sciences and engineering.

1. Students in the program are required to include the following courses in their studies:
   a) Theory: 21, 22, 23, 121, 151 (WIM) (4 units); 150 (3 units); 220A, B, C (4 units each); 250A (4 units)
   b) History: two from 40, 41, 42
   c) Applied: individual studies in performance (two quarters) or Music 192A,B; and Ensemble or 192C (5 units)
   d) Research project: 220D (4 units)

2. Students in Music, Science, and Technology must also pass the Piano and Ear-training Proficiency examinations required of all Music majors.

**MINORS**

Minors in Music and in the Music, Science, and Technology specialization provide the student with a core of essential music courses in the disciplines which establish both a foundation for informed appreciation of music and a basis for more advanced study, should the student wish to pursue it.
MUSIC

Course No. and Subject
Music 21, 22, 23. Elements of Music 12
Music 40, 41, 42. Music-History Survey 12
Choice of one (writing-intensive courses):
Music 140-145. Studies in Music History 4

Two quarters:
Music 158-171. Ensemble 2
Music 172-177. Individual Instruction 6
Academic Elective in Music 4
Total 40

MUSIC, SCIENCE, AND TECHNOLOGY

Course No. and Subject
Music 21, 22, 23. Elements of Music 12
Music 150. Musical Acoustics 3
Music 151. Psychophysics and Cognitive Psychology for Musicians 4
Music 220A. Fundamentals of Computer-Generated Sound 4

Two quarters:
Music 192A. Theory and Practice of Audio Recording 6
Music 192B. Advanced Sound-Recording Technology 3
Music 192C. Session Recording (1 or 2 units/qtr.) 3
Academic Elective in Computer Music 4
Total 36

CONCENTRATIONS

Concentrations are offered in performance, conducting, composition, or history and theory. In each concentration, 6 additional course units in the area of concentration beyond the basic requirements for the major are required. In addition, each concentrator registers for an independent project (198, 4 units) in the senior year under faculty supervision, leading to a senior recital, a composition, a conducting project, or a senior research paper. Specific guidelines and information on the concentration tracks are available from the Department of Music office.

HONORS PROGRAM

Honors in music is awarded by the faculty to concentrators who have produced an independent project of exceptional quality and meet certain departmental standards in musicianship, scholarship, and academic standing. The conferral of honors is done solely through faculty consultation. Students do not petition for honors.

OVERSEAS STUDIES

Courses in music are often available at overseas Stanford programs, especially in Berlin and Moscow. See the Overseas Studies Program section of this bulletin immediately following this section for this year’s listings. Music majors and minors should talk to the Department of Music undergraduate administrator prior to going overseas.

GRADUATE PROGRAMS

University requirements for the A.M., D.M.A., and the Ph.D. are described in the “Graduate Degrees” section of this bulletin.

The following statements apply to all the graduate degrees described below, unless otherwise indicated.

Admission—Applicants are required to submit evidence of accomplishment (scores, tapes, and/or research papers, according to the proposed field of concentration) when they return the application form. Applicants should arrange to take the Graduate Record Examination (GRE) well in advance of the December 30 application deadline. All applicants, except those applying for the A.M. in Music, Science, and Technology (A.M./MST), are also required to submit a departmental entrance test in theory and musicianship, which is sent along with the application. All components of the application are due by December 30.

Department Examinations—All entering graduate students except those in the A.M./MST program are required to take: (1) a diagnostic examination testing the student in theory (counterpoint, harmony, and analysis) and the history of Western music, and (2) a proficiency examination in sight-singing and piano sight-reading given at the beginning of study in the department (usually the week before school begins).

None of Stanford’s required undergraduate courses may be credited toward an advanced degree unless specifically required for both degrees.

Only work that receives a grade of ‘A,’ ‘B,’ or ‘Satisfactory’ (a passing grade in an instructor-mandated pass/no credit course) in music courses taken as a graduate student is recognized as fulfilling the advanced-degree requirements. Students may need to devote more than the minimum time in residence if preparation for graduate study is inadequate.

MASTER OF ARTS

Residence—A minimum of three quarters of full-time study (considered to be 12 units per quarter of in the Department of Music) in residence is required for both master’s degrees in Music.

MUSIC

Foreign-Language Requirement—Reading knowledge of a language other than English, and the ability to translate into idiomatic English, must be demonstrated in the first quarter of graduate study.

Study Program—Students may concentrate in composition, history, or performance practice. To be recommended for the A.M. degree, a candidate must complete a program of 36 units of graduate course work. Depending on the concentration, the A.M. project will be an investigative essay, a composition, or a demonstration of performance supported by a written commentary on the performance practice involved.

Required are:

Course No. and Subject
Music 200. Graduate Proseminar 4
Three quarters of work in the student’s area of concentration 9-12
Three quarters of ensemble performance 3
Music 299. Master of Arts Project 4
Music 323. Composition Seminar or 4
Music 326. A Performance Practices Seminar 4
Students in the doctoral program who enter directly from the bachelor’s level may, upon completion of the above requirements and the doctoral qualifying examination, be recommended for the A.M. degree. The A.M. project (Music 299) is not required of these students.

MUSIC, SCIENCE, AND TECHNOLOGY

This is a one-year program of 36 units focusing on the integration of music perception, music-related signal processing and controllers, and synthesis. The program is designed for students having an undergraduate engineering or science degree or a degree that includes course work in engineering mathematics.

Required are:

Course No. and Subject
Music 151. Psychophysics and Cognitive Psychology for Musicians 4
Music 192A. Foundations of Sound-Recording Technology 3
Music 192B. Advanced Sound-Recording Technology 3
Music 220A. Fundamentals of Computer-Generated Sound 4
Music 220B. Compositional Algorithms, Psychoacoustics, and Spatial Processing 4
Music 220C. Seminar in Computer-Music Research 4
Music 250A. HCI Theory and Practice 4
Music 250B. HCI Performance Systems 4
Music 320. Introduction to Digital Audio Signal Processing and the Discrete Fourier Transform 2
Music 420. Applications of the Fast Fourier Transform 2
Music 421. Signal Processing Methods in Musical Acoustics 2
Total 36

DOCTORAL PROGRAMS

Residence—The candidate must complete a minimum of three years of full-time (12 units or more per quarter) work. Generally, it takes more than three years due to part-time (9 units per quarter) study during the second, third, and fourth years, when the student also acts as a Teaching Assistant or Predoctoral Research Affiliate (see Residency under the “Graduate Degrees” section of this bulletin). Doctoral candidates working on Ph.D. dissertations or Doctor of Musical Arts (D.M.A.) final projects that require consultation with faculty members continue enrollment in the University under Terminal Graduate Registration (TGR), after they have reached the required residency units for that category.

Foreign-Language Requirement—At the time of advancement to candidacy, all D.M.A. and Ph.D. students in the Computer-Based Theory and Acoustics program are required to have demonstrated a reading knowledge of a language other than English and the ability to translate
into idiomatic English. Ph.D. candidates in Musicology are required to demonstrate proficiency in German and a similar competence in a second language, chosen from French, Italian, or Latin (or, on a case-by-case basis, another language, if it has significant bearing on the candidate's field of study).

Qualifying Examination—A written and oral examination for admission to candidacy is given just prior to the fourth quarter of residence for D.M.A. and Ph.D. students in the Computer-Based Music Theory and Acoustics programs; for Ph.D. students in Musicology, the exams are given just prior to the seventh quarter of residence. This exam tests knowledge of history, theory, repertory, and analysis.

Teaching—All students in the Ph.D. or D.M.A. degree programs, regardless of sources of financial support, are required to complete six quarters of their supervised teaching at half time. Music 280 (given in Autumn Quarter) is a required course for Teaching Assistants.

Basic Requirements—Doctoral programs in the Department of Music do not require the A.M. degree as a prerequisite. All students entering directly from the bachelor's degree level are required to take the following course (which is, however, required of all students in musicology, regardless of entering degree level):

Course No. and Subject
200. Graduate Proseminar 4

All doctoral candidates must take:
301A,B,C. Music Analysis: Modal, Tonal, and Post-Tonal 12

DOCTOR OF MUSICAL ARTS IN COMPOSITION

The Doctor of Musical Arts (D.M.A.) degree in Composition is given breadth through collateral studies in other branches of music and in relevant studies outside music as seems desirable. A minimum of 72 units of credit is required for the degree.

Examinations—A written examination in the candidate's special area of concentration is given no later than the seventh quarter after passing the qualifying examination. A public lecture-demonstration is also required during the last quarter of residence. It should be one hour in length, treating aspects of the final project.

Requirements—Besides those requirements listed above, candidates are expected to produce a number of works demonstrating their ability to compose in a variety of forms and for the common media: vocal, instrumental, and electronic music. If possible, the works submitted are presented in public performance prepared by the composer. Annual progress is reviewed by the composition faculty. The final project in composition is an extended work for instruments, voices, electronic media, or a combination of these. Music 323, Doctoral Seminar in Composition (16 units) is a required course.

DOCTOR OF PHILOSOPHY

The Ph.D. in Music can be pursued in two concentrations: Musicology or Computer-Based Music Theory and Acoustics.

Examinations—
1. Special Areas: a written and oral examination testing the student's knowledge of music and research in the area of special concentration is given no later than the seventh quarter after passing the qualifying examination. This includes an oral defense of the dissertation proposal. The examining committee comprises prospective readers of the dissertation.
2. Ph.D. Orals: the University oral examination, taken once the dissertation is substantially underway, is an oral presentation and defense of dissertation research methods and results.

Requirements—Besides those requirements listed above, Music 221A and B, History of Music Theory (8 units), are required courses for all Ph.D. students. Other requirements by concentration are:

MUSICOLY
Course No. and Subject Units
269A. Seminar in Performance Practices 4
300A,B. Seminar in Notation 8
310. Research Seminars in Musicology* 24-40

312A,B. Aesthetics and Criticism of Music 8

The requirement is for eight seminars of 3.5 units each. Students may petition to take up to two graduate seminars in other departments, in consultation with their adviser.

COMPUTER-BASED MUSIC THEORY AND ACOUSTICS
220A,B,C. Computer-Generated Music Seminars 12
220D. Research in Computer Music 12
320. The Discrete Fourier Transform 4

JOINT PH.D. IN MUSIC AND HUMANITIES

The department participates in the Graduate Program in Humanities leading to a joint Ph.D. degree in Music and Humanities. For a description of the program, see the "Interdisciplinary Studies in Humanities" section of this bulletin.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

Many Department of Music courses have pages on the World Wide Web, which are linked to the Music home page (see above). Courses with Web pages at press time are noted in their entries below.

GENERAL

1. Introduction to Music—Techniques of active listening for an enhanced understanding of various musical styles. Awareness of the basic elements of music is applied to the appreciation of Western art music from the Middle Ages to the present, and to traditions of popular and non-Western music. Questions of musical form, style, expression, and meaning are compared in different historical and cultural contexts.

3 units, not given 2000-01

2A. The Symphony—Symphonic literature 1750 to the present, emphasizing developing skills in critical listening. Ability to read music not required.

3 units, not given 2000-01

2B. The Concerto

3 units, not given 2000-01


3 units, not given 2000-01

3C. Medieval Music

3 units, not given 2000-01

3F. Franz Liszt and the Music of the Romantic Era

3 units, not given 2000-01

4A. The Music of J. S. Bach—Develops awareness and skill in listening to the music of Bach: structure, style, instruments, and aesthetics. Music for the church and chamber: dance music, concerti, cantatas, sonatas, preludes and fugues, and passions.

3 units, not given 2000-01

4B. The Music of Mozart

3 units, not given 2000-01

4C. The Music of Beethoven—The musical works of Ludwig van Beethoven in the context of his life and times. The role of a "classical" heritage (the style of Haydn and Mozart) in Beethoven's musical development, his participation in an emerging Romantic view of music and the arts, the impact of Enlightenment thought and the French Revolution (and its cultural-political consequences) on Beethoven's music, psycho-
analytic interpretations of the composer’s biography, the critical reception of the composer in the 19th and 20th centuries and its relation to Romantic and Modernist ideologies of music and aesthetics.

3 units, not given 2000-01

4F. The Music of Stravinsky
3 units, not given 2000-01

5A. Music in America—The development of popular, folk, and art music in America from the Pilgrims to the present. See Web site.
3 units, not given 2000-01

7B. Explorations in World Music—Introduction to select musical traditions of the world, examining diverse musical languages, styles, and aesthetics within their cultural and social contexts. Develops critical listening and analytic skills in understanding each tradition, focusing on the perception of musical time. Hands-on workshops.
3 units, not given 2000-01

11,13,14,15,16,17. Stanford Introductory Seminars
14N. Stanford Introductory Seminar: Technology and the Arts—Preference to freshmen. An investigation into the sometimes symbiotic, sometimes adversarial relationship between art and technology. Broad historical view of the affect of science and technology on the arts and vice versa, with emphasis on digital technology and music. Lectures, demonstrations, film screenings, and critical discussions.
GER:3a (DR:7)
3 units, Spr (J. Berger)

14Q. Stanford Introductory Seminar: Music and Poetry—Preference to sophomores. The ancients called poetry lyric to be sung to the lyre; they considered it inseparable from music, but there is also ancient precedent for the view that poetry contains its own kind of music. The setting of lyric poetry to music, in songs of the Troubadours of the Middle Ages, lute songs, and madrigals of the Renaissance, Lieder of the German Romantics, French chansons of the late 19th and early 20th centuries. The study of poetry for its inherent musicality; of the music for the ways it realizes and develops that musicality and for what music adds above and beyond the poetry. Recommended: basic ability to read musical notation.
GER:3a (DR:7)
3 units, Win (Cohen)

15Q. Stanford Introductory Seminar: Debussy and the Music of French Impressionism—Preference to sophomores. The music evolving out of the poetic school of Symbolism and the artistic movement of Impressionism in France. An examination of the social and cultural settings for these movements, and of their creative products, including a foundation for the study of the music. Focus is on the music of Claude Debussy, whose contributions helped define the artistic revolutions of the early 20th century. Careful listening to representative works is the basis for discussions and projects.
3 units, Win (Cohen)

GER:3a,4b (DR:3 or 7)
3 units, Aut (Sano)

17N. Stanford Introductory Seminar: The Operas of Mozart—Preference to freshmen. Four of Mozart’s mature operas have held the stage uninterruptedly since their premieres, the earliest works in the operatic repertoire never to go out of fashion. What accounts for this extraordinary staying power? Close reading of selected operas, with attention to the history of their composition, performance, and reception, and to their changing significance from Mozart’s time to ours.
GER:3a (DR:7)
3 units, Win (K. Berger)

18. Jazz History
18A. Ragtime to Bebop (1900-1940)—From the beginning of jazz to the war years. GER:3a (DR:7)
3 units, Win (Berry)

18B. Bebop to Present (1940—)—Modern jazz styles from Bebop to the current scene. Emphasis is on the significant artists of each style.
GER:3a (DR:7)
3 units, Spr (Berry)

19. Introduction to Music Theory—For non-music majors and music majors or minors unable to pass the proficiency test for entry to 21. The fundamentals of music theory and notation, basic sight reading, sight singing, ear training, keyboard harmony; melodic, rhythmic, and harmonic dictation. Skill oriented, using piano and voice as basic tools to develop listening and reading skills. See web site. GER:3a (DR:7)
3 units, Aut, Spr (T. Berger)

20A. Jazz Theory—Introduces the language and sounds of jazz through listening, analysis, and compositional exercises. Students apply the fundamentals of Western music theory to the study of jazz. Prerequisite: 19 or consent of instructor. GER:3a (DR:7)
3 units, Aut (Nadel)

20B. Advanced Jazz Theory—Analysis of a variety of approaches to improvisation through listening and transcribing, and developing familiarity with important contributors to this music. Topics: scale theory, altered dominants, and substitute harmony. Prerequisite: 20A or consent of instructor.
3 units, Win (Nadel)

20C. Jazz Arranging and Composition—Jazz arranging and composition for small ensembles. Foundation for writing for big band. Prerequisite: 20A or consent of instructor.
3 units, not given 2000-01

111. Perspectives in North American Taiko—The musical, cultural, historical, and political perspectives of taiko through drumming, readings, discussion, workshops, and original research. Japanese music and Japanese American history: relations between performance, cultural expression, community, and identity. GER:3a,4b (DR:3 or 7)
4 units, Spr (Sano, Uyechi)

127. Instrumentation and Orchestration—Study of individual instruments, instrumental groups within the orchestra, and combinations of groups. Arrangements from piano music to orchestral music. Score analysis with respect to orchestration. Practical exercises using chamber ensembles and school orchestra. Prerequisite: 23.
3 units, Spr (Aquilanti)

187. The Work of Art and the Creation of Mind—(Enroll in Education 200.)
4 units, Win (Hannah, Rehm, Ross, Sano)

FOUNDATION FOR A.B. MAJOR

21,22,23. Elements of Music—Melody, harmony, counterpoint, and rhythm are studied through analysis, composition, and exercises in practical musicianship. Emphasis is on tonal theory with components in melody, counterpoint, and harmony. Analytical and practical musicianship skills are taught, with analysis and compositional projects in historical styles. Students with previous training in theory should take a placement exam given at the beginning of each quarter for admission to more advanced courses.

21. Elements of Music I—Introduction to tonal theory. Practice and analysis. Diatonic harmony focusing on melodic and harmonic organization, functional relationships, voice-leading, and tonal structures. Development of ear-training and keyboard-harmony skills; acquisition of a variety of analytical methods and development of listening strategies. Students intending to continue with 22-23 who do not have
piano proficiency should begin 12 (class piano) concurrently. See web site. Enrollment limited to 40. Prerequisite: pass proficiency examination in basic musical skills given on first day of class (students who do not pass have the option of taking Music 19). GER:3a (DR:7)
4 units, Aut (Applebaum)
Win (Alden)

22. Elements of Music II—Introduction to chromatic harmony focusing on secondary functions, modulations, harmonic sequences, mode mixture, the Neapolitan and augmented sixth chords. Analysis of musical forms and harmonizations is complemented by harmonic and melodic dictation, sight singing, and other practical skills. See web site. Prerequisite: 21 or consent of instructor. GER:3a (DR:7)
4 units, Win (McGinn)
Spr (Alden)

23. Elements of Music III—Continuation of chromatic harmony, complex forms, and introduction to early 20th-century techniques. Satisfactory passage of ear-training proficiency exam, part of the course’s final, is a requirement for course completion and for continuation in the major sequence. Passage of departmental piano-proficiency exam is also required to pass this course. Prerequisite: 22 or consent of instructor. GER:3a (DR:7)
4 units, Aut (Aquilanti)
Spr (Staff)

40,41,42. Music History—The history of Western art music from Gregorian chant to the present, stressing major styles and genres in their intellectual and institutional settings.

40. Music History to 1600—Prerequisite: 23 (may be taken concurrently). GER:3a (DR:7)
4 units, Aut (Alden)

41. Music History 1600-1830—Prerequisite: 40. GER:3a (DR:7)
4 units, Win (Plebuch)

42. Music History since 1830—Prerequisite: 41. GER:3a (DR:7)
4 units, Spr (Code)

121. Analysis of Tonal Music—Complete movements, or entire shorter works of the 18th and 19th centuries, are analyzed in a variety of theoretical approaches. Prerequisites: 23, successful completion of the ear-training and piano-proficiency examinations. GER:3a (DR:7)
4 units, Aut (Barth)

122A. 18th-Century Counterpoint—Analysis and composition of two- and three-part inventions and three- and four-voice fugues. Use of keyboard, ear training, and sight singing underlies all written work. Prerequisites: 23, successful completion of the ear-training and piano-proficiency examinations.
4 units, Win (Aquilanti)

122B. Harmonic Materials of the 19th Century—Analysis of 19th-century music, with compositional exercises based on 19th-century models. Prerequisites: 121 or consent of instructor, successful completion of the ear-training and piano-proficiency examinations.
4 units, Spr (McGinn)

122C. Introduction to 20th-Century Composition—Analysis of contemporary works, with an emphasis on music since 1945. Projects in free composition based on 20th-century models. Prerequisites: 121 or consent of instructor, successful completion of the ear-training and piano-proficiency examinations.
4 units, Aut (Ferneyhough)

COMPOSITION

123. Undergraduate Seminar in Composition—Weekly discussion on current trends in composition. May be repeated for credit. Prerequisite: music major, and 23 or consent of instructor.
3 units, Win (Applebaum)

125. Individual Undergraduate Projects in Composition—Individual projects in creative work. May be repeated for credit. Prerequisites: music major, and at least one quarter of 123.
1-3 units, Aut, Win, Spr (Staff)

323. Doctoral Seminar in Composition—Illustrated discussions of compositional issues and techniques. Students present their own work to the class, and individually to the instructor.
4 units, Aut (Ferneyhough)
Win (Harvey)
Spr (Applebaum)

325. Individual Graduate Projects in Composition
1-5 units, Aut, Win, Spr (Staff)

HISTORY AND LITERATURE

140,141,142,143,144,145. Seminars in Music History—Specialized topics in music history are each offered at least once within any two-year period. Topics vary each year. May be repeated for credit.

140. Studies in Medieval Music—Prerequisite: 40. (WIM)
4 units, Aut (Mahrt)

141. Studies in Renaissance Music—Prerequisite: 40. (WIM)
4 units, Win (Alden)

142. Studies in Baroque Music—Prerequisite: 41. (WIM)
4 units, Spr (Plebuch)

143. Studies in Classic Music—Prerequisite: 41. (WIM)
4 units, alternate years, given 2001-02

144. Studies in Romantic Music—Prerequisite: 42. (WIM)
4 units, alternate years, given 2001-02

145. Studies in Modern Music—Prerequisite: 42. (WIM)
4 units, alternate years, given 2001-02

146. Keyboard Fantasias of the 17th and 18th Centuries—For upper-class undergraduates and graduate students. The Fantasia, the paradigmatic genre of free compositional style, experimental in the 17th and 18th centuries, was often avantgardistic with respect to musical form, harmony, meter, counterpoint, and virtuosity, and sometimes notated without bar lines or disseminated as examples of improvisations for other composers, organists, and even amateurs. Performance practice and style history in works by J.S. and C.P.E. Bach, Froberger, Sweelinck, Mozart, and others. See web site.
3 units, not given 2000-01

147. Hindemith—For upper-class undergraduates and graduate students. Introduction to the work of Paul Hindemith (1895-1963); selected works from his oeuvre; his achievements in the broader context of 20th-century music history. Aim is an informed reassessment of this controversial figure. Prerequisite: 42 or consent of instructor.
3 units, not given 2000-01

148. Shakespeare in 19th-Century Music—For upper-class undergraduates and graduate students. Romantic music was profoundly literary in its inspiration, and Shakespeare was the single most literary presence in the music of 19th-century Europe, in opera, and in a wide variety of instrumental music (Beethoven, Berlioz, Mendelssohn, etc.). The musical uses of Shakespeare; discussion of the changing ideas of musical drama and the nature and limits of musical expression, representation, and "narrative." Plays: Romeo and Juliet, Hamlet, Macbeth, Othello, King Lear, Measure for Measure, and Merry Wives of Windsor in the context of the musical works of the time.
3 units, not given 2000-01

149. Instrumental Music with Electronics—For upper-class undergraduates and graduate students. The link between the "traditional" evolution of instrumental, orchestral, and vocal music and the revolutionary world of the electronic studio occurs in works where the two are combined. Focus is on such linking works, from Stockhausen's contri-
butions to the products of IRCAM (Boulez, Murail), etc. Prerequisite: ability to read contemporary scores.

3 units, not given 2000-01


221A. 4 units, alternate years, given 2001-02
221B. 4 units, alternate years, given 2001-02

240, 241, 242, 243, 244, 245. Seminars in Music History—For graduate students. Topics as in 140-145. Participation in upper-class seminars, with additional in-depth research. Specialized topics in music history are each offered at least once within any two-year period. Topics vary each year.

240. Studies in Medieval Music
4 units, Aut (Mahr)
241. Studies in Renaissance Music
4 units, Win (Alden)
242. Studies in Baroque Music
4 units, Spr (Plebuch)

310. Research Seminar in Musicology—For graduate students. Specialized topics vary each quarter.
3-5 units, Aut (Code)
Win (Plebuch)
Spr (Grey)

312A, B. Aesthetics and Criticism of Music—For graduate students. Selected primary texts focusing on the nature, purposes, and uses of music and other arts.

312A. Ancients and Moderns: Plato to Nietzsche
4 units, Aut (K. Berger)
312B. Contemporaries: Heidegger to Today
4 units, Win (K. Berger)

COMPUTER MUSIC AND APPLICATIONS

3 units, not given 2000-01

151. Psychophysics and Cognitive Psychology for Musicians—Basic concepts and experiments relevant to the use of sound, especially synthesized, in music. Introduction to elementary concepts. Listening to sound examples. Emphasis is on salience and the importance of various auditory phenomena in music. Prerequisite: some basic knowledge of music. GER:3a (DR:7) (WIM)
4 units, Spr (J. Berger)

192. Theory and Practice of Audio Recording

192A. Foundations of Sound Recording Technology—For upper-class undergraduates and foundation students; preference given to music majors with MST specialization. Topics: elementary electronics, the physics of sound transduction and microphone operation, selection and placement; mixing consoles; connectors and device interconnection; grounding and shielding; the principles of analog magnetic recording; operation maintenance of recording equipment; the basic principles of recording engineering. Enrollment limited. Prerequisites: 151; algebra, physics basics, and consent of instructor.
3 units, Aut (Kadis)

192B. Advanced Sound Recording Technology—Topics: noise reduction techniques; dynamics and time-delay audio effects; the principles of digital audio; disk- and tape-based digital recorders; digital audio workstations and editing; advanced multitrack techniques; SMFTE and MIDI time code and device synchronization; MIDI sequencing and synchronization. Prerequisite: 192A.
3 units, Win (Kadis)

192C. Session Recording—Independent engineering of recording sessions. May be repeated for credit. Prerequisites: 192A,B.
1-2 units, Aut, Win, Spr (Kadis)

220. Computer-Generated Music

220A. Fundamentals of Computer-Generated Sound—Techniques for digital sound synthesis, effects, and reverberation. Topics: summary of digital synthesis techniques (additive, subtractive, nonlinear, wavetable, spectral-modeling, and physical-modeling); digital effects algorithms (phasing, flanging, chorus, pitch-shifting, and vocoding); and techniques for digital reverberation. Majors (undergraduate or graduate) must take for 4 units. Prerequisite: 22 or equivalent, or consent of instructor.
2-4 units, Aut (Chafe)

220B. Compositional Algorithms, Psychoacoustics, and Spatial Processing—The use of high-level programming language as a compositional aid in creating musical structures. Studies in the physical correlates to auditory perception and a review of psychoacoustic literature. Simulation of a reverberant space and control of the position of sound within the space. Prerequisite: 220A.
4 units, Win (Lopez-Recamano)

220C. Seminar in Computer-Music Research—Individual projects in composition, psychoacoustics, or signal processing. See web site. Prerequisite: 220B.
4 units, Spr (Chafe)

220D. Research—Independent research projects in composition, psychoacoustics, or signal processing. May be repeated for credit. Prerequisite: 220C.
1-4 units, any quarter (Staff)

250. Seminar in Human/Computer Interfaces for Musical Purposes—If student is also taking the full 220 series, both 250A and B must be taken before 220C.

250A. HCI Theory and Practice—HCI issues as they relate to music applications in composition and performance. Project-oriented, examining issues from the technical and theoretical perspectives of computer science, haptics, and music theory.
4 units, Aut (J. Berger, Mathews)

250B. HCI Performance Systems—Continuation of 250A, concentrating on interactive computer-music performance systems. Prerequisite: 250A.
4 units, Win (J. Berger, Mathews)

252. Seminar: Topics in Computer Music—Elective seminar with varying topics each offering. See web site.
1-3 units, not given 2000-01

253. Musical Information: An Introduction—The kinds of musical information used in sound, graphical, and analytical applications. Emphasis is on independent concepts and principles in music representation and research objectives (repertory analysis, performance analysis, theoretical models, similarity, and stylistic simulation). Examples from Western art music. Prerequisites: one year of music theory or equivalent; "methods" courses in such fields as musical analysis, symbolic systems, information processing, sound engineering, or intellectual-property issues.
1-4 units, Win (Selfridge-Field)

254. Seminar: Musical Representation and Computer Analysis—Participants explore the issues introduced in 253 in greater depth and take initiative for research projects related to a theoretical or methodological
issue, a software project, or a significant analytical result. Prerequisite: 253 or consent of instructor.

1-4 units, Spr (Selfridge-Field)

319. Research Seminar on Computational Models of Sound Perception—Weekly seminar on computational models of sound perception, often with a focus on computational models. Topics include: music perception, psychoacoustics, pitch perception, and auditory scene analysis. Basic psychoacoustics, and neurophysiology.

1-3 units, Aut, Win, Spr (Slaney)

320. Introduction to Digital Audio Signal Processing and the Discrete Fourier Transform (DFT)—Introduction to the mathematics of digital signal processing and spectrum analysis for music and audio research. Topics: complex numbers, sinusoids, spectra, aspects of audio perception, and the DFT, and basic Fourier time-frequency relationships in the discrete-time case. See web site.

2-4 units, Aut (J. Smith)

420. Applications of the Fast Fourier Transform (FFT) in Digital Audio Signal Processing—Spectrum analysis and signal processing using FFT, with emphasis on audio applications. Topics: FFT windows, cyclic and acyclic convolution, zero padding and other spectrum analysis parameters; FIR filter design; phase and channel vocoders; the overlap-add and filter-bank-summation methods for short-time Fourier analysis, modification, and resynthesis; tracking sinusoidal peaks across FFT frames; modeling time-varying spectra as sinusoids plus filtered noise; FFT-based sound synthesis; brief overview of different applications.

2-4 units, Win (J. Smith)

421. Signal Processing Methods in Musical Acoustics—Computational models of musical instruments, primarily in the wind and string families, based on physical models implemented using signal processing methods. The models are designed to capture only the "audible physics" of musical instruments using computationally efficient algorithms. Topics include: mass-spring systems and their discrete-time simulation, sampled traveling waves, lumping of losses and dispersion, delay-line interpolation methods, applications of allpass filters and lattice/ladder digital filters in acoustic models, models of winds and strings, scattering junctions, digital filters, and nonlinear junctions implementing oscillation sources such as bow-string and reed-bore couplings. See web site. Prerequisites: 320 or Electrical Engineering 261, or equivalent. Recommended: Electrical Engineering 264.

2-4 units, Aut (J. Smith)

422. Perceptual Audio Coding—The history and basic principles of psychoacoustics-based data-compression techniques; perceptual-audio-coder applications (radio, television, film, multimedia/audio, DVD, EMD). In-class demonstrations: state-of-the-art audio coder implementations (e.g., AC-3, MPEG, etc.) at varying data rates; programming simple coders. Topics include: audio signals representation; quantization; time to frequency mapping; introduction to psychoacoustics; bit allocation and basic building blocks of an audio coder; perceptual audio codec evaluation; overview of MPEG-1, 2, 4 audio coding; overview of other coding standards (AC-3 etc.). Prerequisites: knowledge of digital audio principles; familiarity with C programming. Recommended: 320 and/or Electrical Engineering 261.

3 units, Win (Bosi)

423. Graduate Seminar in Signal Processing Research—See web site.

1 unit, Aut, Win, Spr (J. Smith)
172D/272D. Jazz Piano—By invitation only; priority to majors and jazz-ensemble participants.

172E/272E. Early Piano

173/273. Voice

174/274. Stringed Instruments

174A/274A. Violin
(Kleyman, Harms, Nuttall, Shiffman)

174B/274B. Viola
(Kleyman, Robertson)

174C/274C. Violoncello
(S. Harrison, Hoover)

174D/274D. Contrabass
(Moyer)

174E/274E. Viola da Gamba
(Dornenburg)

174F/274F. Classical Guitar
(Ferguson)

174G/274G. Harp
(Chauvel)

174H/274H. Baroque Violin
(Martin)

174I/274I. Early Plucked Strings
(Staff)

175/275. Woodwind Instruments

175A/275A. Flute
(Blaisdell, Hawley, Maestre)

175B/275B. Oboe
Aut (Hubbard)
Win, Spr (Matheson)

175C/275C. Clarinet
(Brandenburg)

175D/275D. Bassoon
(Olivier)

175E/275E. Renaissance Wind Instruments
(Myers)

175F/275F. Saxophone
(Stein)

175G/275G. Baroque Flute
(Claire)

176/276. Brass Instruments

176A/276A. French Horn
(Ragent)

176B/276B. Trumpet
(Johnson-Hamilton)

176C/276C. Trombone
(Kenley)

176D/276D. Tuba
(Cooley)

177/277. Percussion
(Vereyge)

PERFORMANCE PRACTICES

126. Introduction to Thoroughbass—The development of continuo techniques and skills for figured-bass realization. Performance and analysis of selected repertoire, using thoroughbass principles and exercises based on historical theoretical treatises. Prerequisite: 22.

130. Elementary Conducting

130A. Introduction to Conducting—The fundamentals of baton techniques and rehearsal procedures. The development of coordination of the members of the body involved in conducting; fluency in the various beat patterns and meters; dynamics, tempi, cueing, and use of the left hand in conducting. Prerequisites: 121 and diagnostic musicianship exam given first day of class; preference given to students who have also completed 122B.

130B. Elementary Orchestral Conducting—Techniques specific to the conducting of orchestral ensembles. Prerequisites: 127 or previous orchestral performance experience, 130A.

130C. Elementary Choral Conducting—Techniques specific to the conducting of choral ensembles: warm-ups, breathing, balance, blend, choral tone, isolation principles, recitative conducting, preparation, and conducting of choral/orchestral works. Prerequisite: 130A.

181. Performance of Vocal Literature—Expands the student's knowledge of classical solo voice music, and develops critical listening facilities and communicative performing abilities. Listening: introduction to a diverse vocal repertoire; distinguishing qualities of technique and interpretation. Performing: understanding and communicating text, style. Meant to accompany individual instruction in voice (173/273). Autumn: Bach arias from Cantatas, performed with orchestra at Memorial Church. Winter: chamber operas performed in concert version. Spring: chamber operas performed on stage (continuation of winter). Enrollment limited by audition. May be repeated for credit. See web site.

1 unit, Aut, Win, Spr (Lane)

182. Diction for Singers—The International Phonetic Alphabet and its application to German, French, and Italian vocal literature. Open also to pianists interested in vocal coaching and choral conducting.

1 unit, Win (Dahl)

183. Art Song Interpretation—for advanced singers and pianists as partners. Performance class in a workshop setting. Prerequisite: consent of instructor. Recommended: 170 or 182.

183A. German Lied—Including composers from Beethoven and Schubert to Wolf and Strauss.

1 unit, alternate years, given 2001-02

183B. French mélodie—Including composers from Fauré and Debussy to Ravel and Poulenc.

1 unit, Spr (Dahl)

230. Advanced Orchestral Conducting—May be repeated for credit. Prerequisite: 130B.

2-4 units, Aut, Win, Spr (Lemon)

231. Advanced Choral Conducting—May be repeated for credit. Prerequisite: 130C.

2-4 units, Aut, Win, Spr (Sano)

269A. Seminar in Performance Practices—Performance techniques, theoretical principles, aesthetics, and musical resources of various historical periods.

4 units, alternate years, given 2001-02

270. Graduate Seminar in 20th-Century Performance Practice

4 units, not given 2000-01

ENSEMBLE

An audition is required for admission to any University musical ensemble; audition schedules are posted during the registration period in Autumn Quarter. Audition is by appointment in Winter and Spring quarters: contact the ensemble director. Membership is open to all students
171. Chamber Music—Small combinations for strings, winds, and keyboard instruments. Open to students at the private-lesson-proficiency level to hone ensemble skills, preferably while taking private lessons. Selected string-instrument participants are invited to participate in a chamber orchestra, led by members of the St. Lawrence String Quartet, without conductor. Spring Quarter: chamber orchestra specializing in contemporary repertoire led by members of the St. Lawrence and conducted by Karla Lemon. All new and returning students are required to audition.

1 unit, Aut, Win, Spr (Staff)

UNDERGRADUATE DIRECTED READING AND RESEARCH

198. Concentrations Project—For concentration program participants only. Must be taken in senior year.
4 units, Aut, Win, Spr (Staff)

199. Independent Study—For advanced undergraduates and graduate students who wish to do work outside the regular curriculum. Before registering, student must present specific project and enlist a faculty sponsor.
1-4 units, Aut, Win, Spr (Staff)

GRADUATE RESEARCH AND SPECIAL STUDIES

200. Graduate Proseminar—Required of first-year graduate students in music. Introduction to research in music, bibliographical materials, major issues in the field, philosophy, and methods in music history. Guest lecturers and individual research topics.
4 units, Aut (K. Berger, Nagy)

269B. Research in Performance Practices—Directed reading and research.
1-5 units, Aut, Win, Spr (Staff)

280. TA Training Course—Required for doctoral students serving as Teaching Assistants. Orientation to resources at Stanford, guest presentations on the principles of common teaching activities, supervised teaching experience. Students should take 280 in the second year, as they begin teaching. See web site.
1 unit, Aut (Ben-Tal)

299. Master of Arts Project
4 units, Aut, Win, Spr (Staff)

300A, B. Seminar in Notation—Western notation of the Middle Ages and Renaissance: principles, purposes, and transcription.
300A. Medieval Notation
4 units, Spr (Mahrt)

300B. Renaissance Notation
4 units, not given 2000-01

301A. Modal Analysis
4 units, Spr (Mahrt)

301B. Tonal Analysis
4 units, Aut (Barth)

301C. Post-Tonal Analysis
4 units, Win (Ferneyhough)

302. Research in Musicology—Directed reading and research.
1-5 units, Aut, Win, Spr (Staff)

1-5 units, Aut, Win, Spr (Staff)

341. Ph.D. Dissertation
1-9 units, Aut, Win, Spr (Staff)
OVERSEAS STUDIES PROGRAM

Director of the Program: Russell A. Berman

Stanford Program in Berlin
Director: Karen Kramer
Associate Director: Maria Biege

Stanford Program in Buenos Aires
Faculty: Sergio Berensztein, Adolfo Canitrot, Ezequiel Gallo, Roberto Russell, Claudia Schmidt

Stanford Program in Florence
Director: Ermelinda Campani
Faculty: Riccardo Bruscalgi, Paula Findlen, Antonello La Vergata, Giuseppe Mammarella, Leonardo Morlino, Filippo Rossi, Valdo Spini, Susan Stephens, Timothy Verdon

Stanford Center for Technology and Innovation (SCTI)—Kyoto
Director: Terry MacDougall
Faculty: Monica Beth, John Campbell, Ruth Campbell, Patricia Fister, Charles Fox, Toshiko Fujiwara, Fujiko Hotta, Takernori Inoki, Ikuo Kume, Larry Leifer, Catherine Ludvik, Takayuki Marakami-Yokota, Gil Masters, Junko Minamoto, Haruka Ueda, Mariko Uemiya, Chihiro Yamaoka

Stanford Program in Moscow
Director: Maxim Bratckys
Associate Director: Alexander Abashkin
Faculty: Tayana Boldyreva, Katherine Jolluck, Zinaida Kuznetsova, Vladimir Mau, Norman Naimark, Constantine Orbelian, Inna Shimanskaya, Andrei Zorin

Stanford Program in Oxford
Director: Geoffrey Tyack
Faculty: Maxine Birch, Joseph Corn, Wanda Corn, John Darwin, Paul David, Philip Davies, Michael Gearn-Tosh, Ruth Mateer, Francisco Ramirez, Ramón Saldivar, Stewart Wood

Stanford Program in Paris
Director: Estelle Halevi
Faculty: Corinne Balleix, Colette Daremble, Isaac Getz, Alexandra Giraud, Marie Gréé, Marc Lazar, Todd Lubart, Françoise Manent, Nonna Mayer, Florence Mercier, Susan Okin, Marie-Christine Ricci, Francoise Rullier, Haun Saussy

Stanford Program in Puebla
Dean of International Affairs: Ofelia Cervantes
Faculty: Enrique Cárdenas, Gonzalo Castañeda, Timothy Knab, Isidro Morales

Stanford Program in Santiago
Director: Edmundo Fuenzalida
Faculty: Armando Di Filippo, Ernesto Hajek, Jorge Heine, Oscar Muñoz, Francisco Rojas, Bernardo Subercaseaux, Teresa Valdés

Stanford University encourages students to explore the opportunities of study abroad and to achieve cultural literacy through living, learning, and working in another country. Overseas Studies maintains centers in Berlin, Buenos Aires, Florence, Kyoto, Moscow, Oxford, Paris, Puebla, and Santiago. Students may enroll for one or two quarters at most centers and for three quarters in Berlin, Kyoto-KCJS, Florence, Oxford, and Santiago. Course offerings from engineering, humanities, sciences, and social sciences provide full Stanford credit. Most courses are also reviewed by specific departments and count toward major requirements. Courses that fulfill General Education Requirements in Area 3 or Distribution Requirements in Areas 7 and 9 are usually offered at every center. Academic or paid internships are available at the Berlin, Florence, Kyoto-SCTI, Moscow, and Paris centers. Research opportunities are available in various formats at different centers. Minimum required language preparation varies among centers: Moscow offers a first-year intensive language course for those without prior Russian study; Berlin requires two quarters; Kyoto-SCTI requires two quarters for students in technical majors and five quarters for those in non-technical majors; Florence, Paris, and Santiago require three quarters for Autumn Quarter entry and four quarters for Winter Quarter entry; Buenos Aires, Kyoto-KCJS, Puebla, and Santiago (Spring Quarter) require more advanced language preparations. Depending on language proficiency, students may attend local universities in Berlin, Florence, Paris, and Santiago.

Students remain registered at Stanford and pay regular tuition, along with the Overseas Studies fee which is based on Stanford room and board rates. Regular financial aid applies, and may be increased to cover additional costs. At most centers, students live in a homestay in the host culture or with local students.

Overseas Studies, located on the first floor of Sweet Hall, has a full-time staff and peer advisers to assist students in planning their programs abroad. The information following, while accurate at the time of printing, is subject to change. Consult the Overseas Studies Program website at http://www-osp.stanford.edu/ for updated information.

COURSES

(AU) indicates that the course is subject to the University Activity Unit limitations (8 units maximum).

International Relations has approved a number of Overseas Studies courses for major credit; these are listed in the "International Relations" section of this bulletin.

BERLIN

2M. Opera—(Same as Music 2M.) An introduction to opera. Operas studied are those performed at the Deutsche Staatsoper Berlin, including Richard Wagner’s Der Ring des Nibelungen. Focus is on the work’s genesis, reception, and musical innovation. Visits to the production. GER:3a (DR:7)

3 units, Spr (Hinton)

30. Berlin vor Ort: A Field Trip Module—The cultures of Berlin as preserved in museums, monuments, and architecture. Berlin’s cityscape as a narrative of its history from baroque palaces to vestiges of E. German communism, from 19th-century industrialism to grim edifices of the Sachsenhausen concentration camp. Competing political agendas and the criteria of historical selection in monument-alteration and removal, renaming streets, and structuring the capital city. Focus is on the interface between sociopolitical life and artistic expression. (In German) (AU) I unit, Aut, Win, Spr (Neckenig)

495
37. Web Projects—Plan and develop a multimedia web project based on academic work associated with a concurrent course. Prerequisite: knowledge of web design or preparation on home campus.
   1 unit, Aut, Win, Spr (Kramer)

38. Research Module—Continuation of 177A, below. Research under the guidance of a local specialist in libraries, archives, research institutes, and/or in the field. Prerequisite: German Studies 177A.
   3-4 units, Spr (Kramer)

66. Theory from the Bleachers: Reading German Sports and Culture—German culture in the past and present through the lens of sports. German sports culture in its broader intellectual, societal, and historical-political contexts; comparisons to British, French, and American sports culture. The theory and practice of fair play, the relationship of team and individual, the production and deconstruction of sports heroes, and the phenomena of sports nationalism. Attendance at sports events; English and German texts. (In German)
   2 units, Win (Junghanns)

99X. Product Benchmarking and Artifact Dissection—(Same as Mechanical Engineering 99X.) Hands-on seminar on the form, function, and meaning of artifacts. A series of mechanical dissection labs resolve common questions of everyday products and provide confidence in “hands-on” skills. Artifacts are discussed in the context of the culture in which they are used. 2 units if an independent project is completed.
   1-2 units, Spr (Sheppard)

101A. Contemporary Theater—(Same as Drama 101A, German Studies 195.) Texts of plays are supplemented by the theoretical writings of the respective playwrights and background reading in theater history and theory. Weekly theater trips, a tour of backstage facilities, attendance at a rehearsal, and discussions with actors, directors, or other theater professionals. (In German) GER:3a (DR:7)
   5 units, Spr (Kramer)

112M. Thomas Mann’s Novel: Doktor Faustus—(Same as Music 112M.) Seminar taught at Freie Universitat with Germanistik Professor Rolf-Peter Janz. Musical focus is provided by Mann’s novel Doktor Faustus. Follow-up tutorials and discussions explore the difference between the Berlin and Stanford ways of conducting academic business. GER:3a (DR:7)
   4 units, Spr (Hinton)

113X. Engineering Design—(Same as Mechanical Engineering 113X.) Information from various sources is used to create designs and models of new mechanical devices. Work on a team design project sponsored by industry. Final project results presented to a professional jury.
   3 units, Spr (Sheppard)

114X. The European Union, Superpower in the Making?—(Same as Political Science 114X.) The single European currency, the Kosovo war, and initiatives for a common foreign and security policy (CFSP) challenge the EU to define its new role in the world. Topics: eastward enlargement, questions about the bilateral relationship with the U.S., Turkey, the Mediterranean area, and the future international role of the EURO. The ability of the European Union to become a global actor in security and economic affairs. GER:3b (DR:9)
   4-5 units, Win (Brückner)

115X. The German Economy: Past and Present—(Same as Economics 115X, Political Science 121X.) The history of the German economy in: the Wilhelmine Empire, the Weimar Republic, the Third Reich, the post-war “real socialism” of the GDR, and the free market economy of the FRG. The processes of economic transition since unification and the current challenges faced by united Germany as Europe’s first economic power and the world’s second largest export nation. GER:3b (DR:9)
   4-5 units, Aut (Klein)

117V. The Industrial Revolution and its Impact on Art, Architecture, and Theory—(Same as Art and Art History 141V; Science, Technology, and Society 117V.) The interlinkage of architecture and painting with technological and scientific development. In a period of industrial revolution, the dominance of positivist thinking and empirical methods promotes in the cultural and artistic realm a response of euphoric acceptance or emphatic rejection. Artwork as a social, cultural, and spiritual “symbol” is a response to scientific and technological development, yet claims timeless validity. Topics: frictions between Idealism and Realism, photography and painting, Historicism and Functionalism, Expression and Dadaism, Futurism and New Sobriety, Functionalism and Nazi Classicism. GER:3a (DR:7)
   5 units, Aut (Neckenig)

120V. Industry, Technology and Culture, 1780-1945—(Same as History 105V; Science, Technology, and Society 120V.) Technological innovations of the past 200 years have defined the modern world; and human inventions have left indelible marks on culture and civilization. The dialectical relationship between material, intellectual, and social culture on, e.g., modern materials, transport and communications systems; the micro- and macrosystems discovered in physics, chemistry, and astronomy; and the revolutionizing influence of photography, film, and television. GER:3a (DR:7)
   4 units, Win (Neckenig)

126R. The German Reformation and its Consequences, 1500-1648—(Same as Religious Studies 126R.) Religious re-formations in 16th-century Germany and the spiritual, social, and political changes that accompanied them. The rise of Protestantism and the split between Protestantism and Roman Catholicism in Germany. What new religious proposals and understandings conspired to change the face of Christianity? What immediate effects and longer-lasting consequences issued from these developments? GER:3a (DR:8)
   4 units, Win (Pitkín, Sockness)

126X. A People’s Union? Money, Markets, and Identity in the EU—(Same as Political Science 126X.) First of two-quarter sequence. The changes in the European Union from a loose economic club for internal trade to a powerful regulatory center with a wide scope of competencies. How this process will change the European style of welfare states and create a new political system and a new type of EU citizenship. The future role of Germany in the EU. Field trips and guest speakers. GER:3b (DR:9)
   4-5 units, Aut (Brückner)

128B. Sissi Sits, Lola Runs: Gender Moves in German Movies—(Same as German Studies 128B.) The gendered image in German cinema from the silent era to the present, including cinema under communism. How German cinematic images of man and woman have changed; the extent to which feminist film theories developed in the context of classical Hollywood cinema are adequate instruments for assessing gender relations in communist films; and how New German Cinema and DEFA frequently articulate issues of national identity via the female protagonist. (In German) GER:3a, 4c (DR:7)
   5 units, Aut (Kramer)

134R. Gender and Cultural Discourses in Modern German Literature—(Same as German Studies 134R.) Analysis of literary texts based on the hypothesis that gender identity is a culturally shaped category, susceptible to historical development and subject to change. How gender identity varies as a cultural and social role, and how it is discussed and/or undermined in German literature of the past 30 years. GER:4c (DR:1)
   4 units, Spr (Hörnigk)

141R. Religion in the Age of Goethe—(Same as Religious Studies 141R.) Religious thought in Germany from 1770-1835, focusing on Berlin’s leading representatives of Aufklärung, Romanticism, and German Idealism: Gotthold Lessing, Moses Mendelssohn, J. G. Fichte,
especially in Germany. Comparisons with U.S. and Britain highlight the international aspects of the economic and environmental policies of the Red-Green Coalition Government. The globalization of the world's economy and Germany's competitiveness as a location for production, services, and R&D, focusing on the German car industry. GER:3b (DR:9)

4 units, Win (Klein)

174. Sport-Frei! Sports and Modernity in Comparative Perspective—(Same as German Studies 174.) Introduction to the theory and history of mass spectator sports and their role in modern societies, especially in Germany. Comparisons with U.S. and Britain highlight the peculiarities of sports in German culture and create a vantage point to understand German culture, past and present. Concepts of competing and fighting, rule observance, and the role of sports in W. and E. Germany before and after unification. The relationship between sports and politics, including analysis of the 1936 Berlin Olympic Games. GER:3b (DR:9)

4-5 units, Aut (Jungbunlas)

227V. The Second World War in Berlin—(Same as History 227V.) The impact of WW II on Berlin, 1939-49. Visits to some of the most important sites including the Oder River valley, where the last major battle for the city began. Sources emphasize first-hand accounts, beginning with Berlin Diary and ending with Norman Naimark's book on the Soviet occupation. Other themes: resistance, the role of women, propaganda, the deportation of the Jews. GER:3a (DR:7)

4-5 units, Aut (Sheehan)
113X. Contemporary Argentine Political History—(Same as Political Science 113X.) The themes and problems of the contemporary political history of Argentina. Students select topics to investigate throughout the term.
4 units, Spr (Berenzstein)

162X. Themes in the Political Economy of Argentina—(Same as Economics 162X.) Problems of the contemporary political economy in Argentina. Students select topics to investigate throughout the term.
5 units, Spr (Canitrot)

168X. Seminar on Culture, City, and Politics in Argentina—(Same as Political Science 168X.) The comparative influence of culture and politics on architecture and city planning in Buenos Aires and other cities. Focus is on Argentina, with analysis of other locations applied to the case of Argentina. Field trips and group work.
4 units, Spr (Shmidt)

FLORENCE

41. Is Contemporary Art Edible?—A complete view of the ever-changing and multi-faceted scene of contemporary art through visual and sensorial stimulation. The various ways in which art is thought of and produced in Italy today.
1 unit, Aut (Rossi)

42. Academic Internship—Mentored internships are offered in banking, education, the fine arts, health, media, not-for-profit organizations, publishing, and retail.
4 units, Spr (Staff)

52. Realism, Utopia, Myth, and Society in Italian Cinema: Bernardo Bertolucci, Pier Paolo Pasolini, and Federico Fellini—(Same as Communication 52, Italian 190F.) Major films in the careers of Bertolucci, Pasolini, and Fellini are used to assess the ways in which realism, myth, utopia, and society are theorized and problematized. Topics: ideology and representation, class and specificity of intellectual labor, canonicity, the creation of a personal mythology of imagination, memory, and reality. (In Italian) GER:3a (DR:7)
5 units, Win (Campani)

106V. Italy: From an Agrarian to a Post-Industrial Society—(Same as History 106V, Political Science 158X.) Italian history from the Risorgimento to the present. Italian society, crises, evolution, values, and the relation to the political institutions existing in different periods. The ideologies, political doctrines, and historical events which contributed to the formation of modern Italy’s predominant subcultures, Catholic and Socialist. (In Italian) GER:3b (DR:9)
4 units, Aut (Mammarella)

111Y. From Giotto to Michelangelo: Introduction to the Renaissance in Florence—(Same as Art and Art History 111Y.) Lectures, site visits, and readings reconstruct the circumstances that favored the flowering of architecture, sculpture, and painting in Florence and Italy, late 13th to early 16th century. Emphasis is on the classical roots; the particular relationship with nature; the commitment to human expressiveness; and the rootedness in real-world experience, translated in sculpture and painting as powerful plasticity, perspective space, and interest in movement and emotion. GER:3a (DR:7)
4 units, Win (Verdon)

115Y. The Duomo and Palazzo della Signoria: Symbols of a Civilization—(Same as Art and Art History 115Y.) The history, history of art, and symbolism of the two principal monuments of Florence: the cathedral and the town hall. Lectures, site visits, and readings grasp the points of common meaning and ideological difference between the religious and civic symbols of Florence’s history from the time of Giotto and the first Guelph republic to Bronzino and Giovanni da Bologna and the Grand Duchy. GER:3a (DR:7)
4 units, Aut (Verdon)

119. Gender and Power in Ancient Rome—(Same as Classics 119.) The social construction of gender in the ancient Mediterranean from the beginnings of the Roman republic through the early Christian period. The differences between ancient and modern gender codes. Topics: public performances of manliness and womanliness, Christian inversion or transgression of Roman norms of gender behavior, explicit connections between playing gender roles and the acquisition of power. GER:3a,4c (DR:7f)
units to be announced, Win (Stephens)

120X. Italy: Crisis, Change, and Choice—(Same as Political Science 120X.) Recent changes in the traditional parties, the breakdown and disappearance of the Christian Democratic and the Socialist parties, establishment of new actors, and the stronger role of unions have been complemented by a new electoral system and a leftist cabinet. Important changes to the constitution have been decided and new rules chosen. Comparisons with other European democracies and the U.S. to understand the resulting Italian system within a more consensual or majoritarian direction. The main features of the crisis are analyzed and the changes and choices assessed. (In Italian) GER:3b (DR:9)
5 units, Win (Morrino)

123X. European Union and Southern Europe: The Challenge of Europeanization—(Same as Political Science 123X.) The impact of the European Union on Southern European democracies: Greece, Italy, Portugal, and Spain. A comparison of those four countries, examining European policies; the Europeanization of Southern Europe; consolidation, stability, and European membership; the international and domestic impact. GER:3b (DR:9)
units to be announced, Spr (Morrino)

134F. Modernist Italian Cinema—(Same as Italian 134F.) Cinema is the embodiment of modernity. It develops in the wake of modernism proper, but can be understood as one of its technological and aesthetic expressions. Topics: cinema’s archeology in Futurist texts and theories with their nationalistic political flavor and their iconoclastic, radical, and interdisciplinary re-thinking of the language and form of all the arts (Marinetti, Pirandello, D’Annunzio). GER:3a (DR:7)
4 units, Aut (Campani)

150. The City of Rome—(Same as Classics 150.) The ways in which the reality of the ancient city and its symbolic function changed over time. The origins and growth of Rome and the ways it was transformed and understood by subsequent generations. Topics: origin myths, topography and monuments, domestic vs. public spaces, rhetoric of city vs. country, the coming of the Christians, Rome as Medieval tourist attraction, Rome as a ruin. GER:3a (DR:7)
units to be announced, Win (Stephens)

160F. The Making of Literary Identity: From Dante to Machiavelli—(Same as Italian 160F.) Italian Renaissance literature is placed in the context of the Renaissance culture by relating texts and authors to more historical and ideological issues: Petrarch, Boccaccio, Machiavelli, Guicciardini, Castiglione, Ariosto, and Tasso. Main issues: the peculiar relation in Italy between geography, language, and literary genres; the foundation of fundamental modes of writing such as lyric poetry, historical-historiographic discourse, chivalric romance; the polycentric nature of Italian Renaissance literature; and the status of the writers with regard to questions of gender. (In Italian) GER:3a (DR:7)
4-5 units, Win (Bruscalogi)

163X. Living in the Past: Italy in the Anglo-American Imagination—(Same as English 163X.) What Italy has meant to American and English
writers over the course of several centuries. How poets and novelists have represented Italian character and culture in their writings. The culture itself and our relationships to it. GER:3a (DR:7)

5 units, Spr (Evans)

178F. The Integration of Europe—(Same as Italian 178F.) The historical, political, economic, and cultural aspects of the process of European integration from a general perspective and from the specific point of view of Euro-U.S. relations. The euro, the EMU, and what it means for those nations which have accepted it. Questions of the future enlargement of the EU to E.-Central European countries. The role of NATO, WEU, and the construction of a common European foreign and security policy in the wake of the Amsterdam treaty. A forecast for the election of the new European Parliament and appointment of the European Commission. GER:2b (DR:6)

5-4 units, Aut (Berman)

213V. Power, Art, and Knowledge in Renaissance Italy—(Same as History 213V.) The defining features of the society that gave us the Renaissance: the world of Leonardo, Machiavelli, and Michelangelo. Topics: intersections of history, politics, art, and literature in the 15th and 16th centuries; the relationship between Renaissance and Reformation. GER:3a (DR:7 or 8)

5 units, Aut (Findlen)

214V. Science, Technology, and Art: The Worlds of Leonardo—(Same as History 214V.) The world of Leonardo, looking at his range of interests and accomplishments from the Mona Lisa to human anatomy and flying machines. The relationship between the society of Renaissance Italy and the work of Leonardo; the persistence of the Renaissance in the late 20th century. On-site visits to artifacts and exhibits in or near Florence that illuminate age of Leonardo. GER:3a (DR:7 or 8)

5 units, Aut (Findlen)

215V. The Scientific Revolution: From the Renaissance to the 18th Century—(Same as Science, Technology, and Society 215V; Philosophy 145P; History 215V.) Focus is on crucial changes in man’s view of nature and himself, ca. 1400 to 1750. The interplay between ideas and the ways of thinking across disciplinary boundaries. Scientific developments as major intellectual changes. Topics: Renaissance man, the new attitude toward machines and technology, the birth of a new physics, medicine and natural history, the artist and the scientist. GER:3a (DR:8)

4-5 units, Win (La Vergata)

MULTISITE COURSE

See the “Berlin” section of Overseas Studies Program for course descriptions.

91. Literary Institutions: A Comparative Approach—(Same as Comparative Literature 91, German Studies 126A.) GER:3a (DR:7)

4 units, Win (Berman)

ITALIAN LANGUAGE PROGRAM

The Italian language program has the goal of engaging all students in scholarly work in Italian. Students choose from the following alternatives:

1. Enroll in one of the courses conducted primarily in Italian.
2. Enroll in directed reading conducted primarily in Italian.
3. Enroll in a course at the University of Florence. (These courses typically run from October to mid-March, so this option is available only to two-quarter students.)

All students are encouraged to work with the language resource person offering group and individualized support for language issues.

ON VIDEOTAPE

50F. Introductory Science of Materials—(Same as Engineering 50F.)

GER:2b (DR:6)

4 units, Aut, Win (Bravman)
103K. Upper Advanced Japanese—(Same as Asian Languages/Japanese 103K.)
5 units, Spr (Yamaoka)

ON VIDEOTAPE
See the “School of Engineering” section of this bulletin for course descriptions.

40K. Introductory Electronics—(Same as Engineering 40K.) GER:2b (DR:6)
5 units, Spr (Masters)

50K. Introductory Science of Materials—(Same as Engineering 50K.)
GER:2b (DR:6)
4 units, Spr (Bravman)

113. Electronic Circuits—(Same as Electrical Engineering 113.) Videotaped instructor: Gregory Kovaets.
3 units, Spr (Flynn)

4 units, Spr (Flynn)

MOSCOW

15. Academic Internship—Placements in areas such as journalism, health care, education, international ventures, and technology are an introduction to the Russian society and work experience. Regular meetings with a mentor develop an in-depth evaluation of observations. Findings and analysis are summarized in an academic paper.
4-5 units, Aut, Win (Bratersky)

16. Tutorial—Meet with tutors individually or in very small groups on a chosen topic.
3-5 units, Aut, Win (Bratersky)

21. Ethnic Moscow—Readings on ethnicity in Russia are synthesized in the context of visits to Armenian, Jewish, Georgian, Tatar (Muslim), and Russian communities, places of worship, and cultural events.
3 units, Aut (Orbelian)

28. Music Internship with the Moscow Chamber Orchestra—Advanced student musicians (strings and woodwinds only) may play with one of the world’s great orchestras. Rehearse with the Moscow Chamber Orchestra with private lessons and coaching. Depending on individual ability and scheduling limitations, students perform with the orchestra. Prerequisite: selection by audition.
5 units, Aut (Orbelian)

32. Russian Classical Music—The nature, origin, and history of Russian classical music, and the major contributions of Russian composers to world culture and current trends in the Russian musical world. Rehearsals and concerts in the major halls in Moscow, and visits to museums dedicated to Glinka, Scriabin, and the State Central Theater Museum.
3-4 units, Aut (Orbelian)

119X. Russian Politics—(Same as Political Science 119X.) Introduction to the political, cultural, social, and historical background of Russian domestic life and foreign politics; the major issues in Russian political life; and the political forces currently playing a role in the Russian arena. Emphasis is on an understanding of major interest groups and the political concepts affecting the struggle in Russia; the inter-relationship among politics, economic issues, ethnic-territorial problems; and security matters in Russia itself, in the countries of the former Soviet Union, and on an international level. GER:3b (DR:9)
5 units, Aut (Bratersky)

120X. Economic Reform and Economic Policy in Modern Russia—(Same as Economics 120X.) Problems in economic policy in modern Russia. Topics: Russian economic history; the reasons and logic of economic transformation; and the major components of the economic transformation doctrine. The mechanism of economic policy decision making in modern Russia, realistic patterns and alternatives of economic development, and the logic and direction of the transformation of the elements in the Russian economic system. Discussions with politicians involved in economic decision making. GER:3b (DR:9)
5 units, Aut (Mau)

121V. Russia in the Age of Nobility 1700-1840: State, Society, and Culture—(Same as History 121V.) Insight into a period of Russian history and culture where Russians produced achievements in literature and the arts, but failed to resolve the social and institutional problems created by rapid transformation. The reforms of Peter the Great through the Slavophile-Westernizers controversy established the paradigms of Russia’s historic development and raised issues still determining the intellectual agenda today. GER:3a (DR:7)
5 units, Aut (Zorin)

146X. Contemporary Issues of Russian Society—(Same as Political Science 146X.) Forum addresses the major issues of Russian society today. The problems facing an individual in Russia, issues confronting Russia, issues confronting Russian society, and the main aspects of multiple crises evolving after the collapse of the Soviet Union on post-Soviet space. Prerequisite: some background in Russian studies. GER:3b (DR:9)
4 units, Win (Braetersky)

178/278. Individual Vocal and Instrumental Instruction—(Same as Music 178/278.) Private lessons with outstanding music teachers in Moscow for voice and most instruments. Prerequisite: minimum proficiency on instrument demonstrated by audition.
3 units, Aut (Orbelian)

218V. War and Women in Russia in the 20th Century—(Same as History 218V.) The wartime experiences of women in Russia in the 20th century. The important conflicts, chronologically, fought on Russian territory. The experiences of Russian women are compared to the more studied topic of women in Western Europe in the two world wars. The range of women’s involvement in war. Cultural assumptions about women and the roles assigned to them. GER:3b,4c (DR:9f)
4 units, Aut (Jolluck)

220V. Moscow Project: History and Memory of the Cold War—(Same as History 220V.) A joint project about the ways the Cold War is remembered, taught, learned, and written about in Moscow. Interviews with young Russians and scholars. How Russians, especially the young, remember the Cold War, and how this differs from the way Americans, especially young people, remember it.
3-4 units, Aut (Naimark)

224V. Stalinism, High Stalinism, and the Cold War in Moscow—(Same as History 224V.) Politics and society in Moscow in the period following the Soviet Union’s victory in WWII until the death of Stalin. The Cold War as a social and cultural phenomenon, and as a product of high politics and international relations. Soviet civilization, including art, architecture, film, and literature are sources for reconstructing the lives of Moscow’s citizens in this ostensible triumphant era of the Soviet Empire. GER:3a (DR:7)
5 units, Aut (Naimark)

MULTISITE COURSE
See the “Berlin” section of Overseas Studies Program for course descriptions.
RUSSIAN LANGUAGE PROGRAM

10M. Intensive First-Year Russian—(Same as Slavic Languages 10M.)
10 units, Aut (Staff)

51M. Second-Year Russian I—(Same as Slavic Languages 51M.)
6 units, Aut (Kuznetsova)

52M. Second-Year Russian II—(Same as Slavic Languages 52M.)
6 units, Win (Kuznetsova)

111M. Third-Year Russian I—(Same as Slavic Languages 111M.)
6 units, Aut (Boldyreva)

112M. Third-Year Russian II—(Same as Slavic Languages 112M.)
6 units, Win (Boldyreva)

118A/218A. Self-Paced Russian for Professionals—(Same as Slavic Languages 118A/218A.)
units to be announced, Win (Staff)

177M. Fourth-Year Russian I—(Same as Slavic Languages 177M.)
6 units, Aut (Shimanskaya)

178M. Fourth-Year Russian II—(Same as Slavic Languages 178M.)
6 units, Win (Shimanskaya)

OXFORD

108E. Introduction to Comparative Higher Education: English Universities—(Same as Education 108E.) Interdisciplinary introduction to the idea, organization, and culture of the university, focusing on English universities. A comparative understanding of the patterns of authority and governance, knowledge production and consumption, and the formation of student and faculty cultures within universities. Readings reflect: historical and sociological analyses, descriptions of contemporary university systems and government policies that affect them, and the literary depictions of academic life. GER:3b (DR:9)
units to be announced, Win (Ramirez)

111X. Modern British Politics and Government—(Same as Political Science 111X.) The 1980s marked the beginning of a period of transformation in British politics. Two decades of constitutional and political evolution under Margaret Thatcher have been followed by the election of Tony Blair and his program of constitutional reform. The status quo during the post-war period, specific themes and institutions, and the agendas of constitutional reform of the present government. The prospects for success and likely consequences. GER:3b (DR:9)
4-5 units, Aut (Wood)

114Z. English Literature 1509-1642—(Same as English 114Z.) Open only to students majoring in English and related subjects. Taught jointly for Stanford students and second-year St. Catherine's undergraduates. English literature from the beginning of Henry VIII's reign to the onset of the Civil War, excluding Shakespeare. The poetry, prose, and drama of the period is placed in its literary, cultural, and historical contexts, and key texts are read closely. English major Area: C.
3 units, Aut (Gearin-Tosh)

116Z. English Literature 1642-1740—(Same as English 116Z.) Open only to students majoring in English and related subjects. Taught jointly for Stanford students and second-year St. Catherine's undergraduates. English literature from the Civil War to the middle of the 18th century. The poetry, prose, and drama of the period is placed in its literary, cultural, and historical contexts, and key texts are read closely. English major Area: E.
5 units, Win (Gearin-Tosh)

117W. Social Change in Modern Britain—(Same as Sociology 117W.) Changes in the social institutions, attitudes, and values in Britain over the past 20 years. Social changes occurring as a consequence of the Thatcher years of government. Changes to the British economy, the Welfare State, National Health Service, the education system, the criminal justice system, gender relations, marriage, divorce, reproduction, and the family. The consequences in terms of British competitiveness, income distribution, wealth and poverty, social class, health and illness, educational attainment and skills development, crime, and family life. GER:3b (DR:9)
4-5 units, Aut (Davies)

127X. A New Europe: Conflict and Integration since 1980—(Same as Political Science 127X.) The acceleration of European integration in the West and the collapse of the state-socialism and Russian hegemony in the East have fundamentally altered relations between the states of Europe. The nature and implications of these changes for transnational relations between European nations, and for their domestic politics. Issues: European Union before and after Maastricht, the new Germany in the new Europe, political union and sovereignty, migration and the return of extremist politics, European security after the Cold War, the return to war in late 1990s in Eastern Europe. GER:3b (DR:9)
4-5 units, Win (Wood)

131. Globalization, Nationalism, and Education—(Same as Sociology 131, Education 136.) Schools and universities as laboratories of nationalism. How processes of economic, political, and cultural globalization affect education and its role in shaping national identity and citizenship; and how other national traditions are affected by or buffered from globalization and its organizational carriers. Main project examines the influence of the EU on educational and related cultural policies in Britain. GER:3b (DR:9)
units to be announced, Win (Ramirez)

139V. The European City: 1600-2000—(Same as History 139V.) Over the past 400 years, cities in Europe have been transformed under the impact of population growth, technological change, and revolutionary social and architectural ideologies. How and why the transformation occurred, through key texts and the physical fabric of the cities themselves. Topics: the effects of Baroque patronage in the 17th and 18th centuries, rebuilding the city centers in the 19th century, the growth of suburbs; the impact of mass transportation; the influence of modernist doctrines in the 20th century; and ongoing attempts by governments to tackle endemic problems of slums, poverty, etc. Comparisons with U.S. cities where relevant.
5 units, Spr (Tyack)

140X. The Condition of Postmodernity: England in the Postcolonial Era—(Same as Comparative Literature 140X.) How, in the mid-to-late 20th century, the European and American modernist concern, with transient human aspirations and eternal truths, gave way to a monumental "emptiness of sensibility." The passage from modernity to postmodernity as a cultural material event. Topics: postmodernism—concept or practice; conditions of knowledge, anti-aesthetic, matter of local style or a whole new period; its forms and effects; its advent and closure. GER:3a (DR:7)
units to be announced, Spr (Saldivar)

141V. European Imperialism and the Third World, 1870-1970—(Same as History 141V, Political Science 148X.) European imperialism from its zenith in the late 19th century to the era of decolonization after World War II. The effects of western imperialism in different parts of the Third World. The legacy of imperialism and decolonization to the modern world. GER:3b (DR:9)
5 units, Spr (Darwin)
145V. Britain in the 20th Century—(Same as History 145V.) Political development, the evolution of urban society, and Britain’s changing worldwide role. Topics: the impact of mass democracy, the effects of the two world wars, the development of the welfare state, and recent challenges to the post-war consensus. Themes: changing social relationships, standards of living, and popular culture. GER:3a (DR:7)  
4 units, Aut (J. Corn, W. Corn)

233V. European Architecture: 1500 to 1800—(Same as History 233V.) The development of architecture in western Europe from the High Renaissance through Mannerism and the Baroque to the neo-classical movement. Developments in Italy, France, Germany, Britain, and other European buildings. Emphasis is on the historical context and on the way in which buildings were planned and used. GER:3a (DR:7)  
5 units, Spr (Tyack)

150X. Gardens of Earthly Delight: The Cultural Politics of English—(Same as Comparative Literature 150X.) The cultural geography of English social spaces as sites, or the development of the personal, social, and political experience of English national identity. Focus is on literary forms, landscape art, and garden history, considering the roles of literary and architectural art and the ways that these arts represented the cultural and social ideology of their times. The three major styles in English garden history: formal, romantic, and natura. GER:3a (DR:7)  
units to be announced, Spr (Saldivar)

154Z. English Literature 1740-1832—(Same as English 154Z.) Open only to students majoring in English and related subjects. Taught jointly for Stanford students and second-year St. Catherine’s undergraduates. Survey of English romantic literature. The poetry, prose, and drama of the period is placed in its literary, cultural, and historical contexts, and key texts are read closely.  
5 units, Spr (Staff)

160. Changing Health Care Delivery in Britain—(Same as Human Biology 160.) The delivery of health care in Britain is explored through three related areas: health and illness behavior, contemporary health issues, and health policy. During the last 15 years, health care delivery in Britain has been the focus of reviews and legislative changes, challenging one of the founding principles of the National Health Service (NHS): free health care for all at the point of delivery, irrespective of pay. How far this principle can be upheld in the face of increasing financial restraint and technological advancements. GER:3b (DR:9)  
4 units, Win (Birch)

168X. Path Dependence of Science and Technology since the Industrial Revolution—(Same as Economics 168X.) The methods and concepts for studying the historical development of scientific and technological knowledge and practice in the West since the Industrial Revolution. Applied analysis of path dependent dynamical systems; uses and limitations of “counterfactual history,” perspectives of “evolutionary economics,” “evolutionary epistemology,” and models of technological and institutional “co-evolution.” Prerequisites: Economics 1, 51. Recommended: preparation in the history and philosophy of science, modern economic history, history of technology, or science and technology.  
5 units, Spr (David)

173X,Y,Z. Shakespeare—(Same as English 173X,Y,Z.) Open only to students majoring in Drama, English, and related subjects. Taught jointly for Stanford students and second-year St. Catherine’s undergraduates. A study of the complete dramatic oeuvre of Shakespeare. Focus is on the sources of the plays, historical and dramatic content, and use of language. English major Area: D.  
173X. The Comedies  
5 units, Aut (Gearin-Tosh)  
173Y. The Tragedies  
5 units, Win (Gearin-Tosh)  
173Z. The Late and Problem Plays  
5 units, Spr (Gearin-Tosh)

204V. Museums, History, and Culture—(Same as Art and Art History 152Y; History 204V.) The nature of museums and how these institutions create cultural meaning through their architecture, collecting, and exhibitions. Museum types: natural history, history, decorative arts, and the fine arts. Topics: the development and ideologies of national museums; the politics and poetics of museum display; the impact of recent academic scholarship, including gender analyses and postcolonial studies, on museum practices. GER:3a (DR:7)  
units to be announced, Win (Saussey)

254Z. Drama in Britain Today—(Same as English 254Z, Drama 158D.) The classics of world drama and some contemporary plays. The meanings of the works and theatrical techniques used to complete them on stage. Weekly visits to the theater. GER:3a (DR:7)  
4-5 units, Spr (Mateer)

MULTISITE COURSE

See the “Berlin” section of Overseas Studies Program for course descriptions

91. Literary Institutions: A Comparative Approach—(Same as Comparative Literature 91, German Studies 126A.) GER:3a (DR:7)  
4 units, Win (Berman)

PARIS

40P. Introductory Electronics—(Same as Engineering 40P.) Taught by a staff member of the Institut Supérieur d’électronique de Paris (ISEP): an overview of electronic engineering. Electrical quantities and their measurement, including the operation of the oscilloscope. Digital logic circuits and their functions, including the elementary microprocessors. The basic functions of electronic components, including ideal diodes and transistors; tuned circuits. Lab complements lecture.  
5 units, Aut (Staff)

75. The Age of Cathedrals: Religious Art and Architecture in Medieval France—Major artistic and cultural movements that changed the face of France from the period of Suger in the 12th century through the reign of Saint Louis in the 13th century. Monastic spirituality progressively gave way to an urban culture focused on Man and secular knowledge, which developed daring and sophisticated building techniques. The years 1150-1250 represented a period of architectural renaissance and l’Ile-de-France was its birthplace. GER:3a (DR:7)  
4 units, Aut (Deremble)

110P. French Anthropology—(Same as Comparative Literature 110P.) Close reading and historical contextualization of Emile Durkheim’s Formes élémentaires de la vie religieuse, Michel Leiris’ L’Afrique fantôme and Claude Lévi-Strauss’s La Pensée Sauvage. All three works are of high stylistic and intellectual distinction, and address their times in memorable ways.  
units to be announced, Win (Saussy)

profession in France and the U.S.; developments in health policy and reform; Clinton health reform, the Oregon plan; measures restraining professional autonomy and their implications for the medical profession. (In French and English) GER:3b (DR:9)  
4 units, Win (Rullier)

120P. Baudelaire: A Poet in the City—(Same as Comparative Literature 120P.) Baudelaire’s relation to the city of Paris, a relation that played itself out in a time of lyric poetry. His references to specific places and events and his attempts to give them quasi-epic resonance amount to a new strategy for the survival of poetic language. Readings of Flowers of Evil and Paris Spleen against, e.g., the events of 1848, Baron Haussman’s rebuilding of the city center, the development of tourism, and the emergence of authors as figures of mass veneration or vituperation. GER:3a (DR:7)  
units to be announced, Win (Saussy)

122X. Europe: Integration and Disintegration of States, Politics, and Civil Societies—(Same as Political Science 122X.) European integration is now an economic, social, and political reality. This integration has a history of mutation and a transformation of its very foundation. Topics: the evolution of welfare states, elites, political parties, and systems in Europe; lobbies, trade unions, voluntary associations, social movements, popular protest, citizenship, democracy. GER:3b (DR:9)  
4 units, Win (Halevi)

123Y. French Painting from 1780-1900—(Same as Art and Art History 123Y.) Changes in artistic aims and the interaction between artist and society throughout the period. Weekly field trips to Paris museums holding paintings of David, Ingres, Delacroix, Courbet, Daumier, Manet, Renoir, Monet, Degas, and others. (In French and English) GER:3a (DR:7)  
4-5 units, Win (Lazar)

124X. Building the European Economy: Economic Policies and the Challenges Ahead—(Same as Economics 124X.) The main issues and challenges of European economic construction. The European Economic Union at the end of 1950s; various European economic policies (industrial, agricultural, social, and monetary). Topics: wider definitions of Europe, Europe’s relations with industrial and developing countries, Europe’s challenge in confronting global economic crises.  
5 units, Aut (Germananouge)

155X. Rousseau and His Times—(Same as Political Science 155X.) Thorough reading of Rousseau’s major writings about politics, society, and love against the background of the French Enlightenment. A short account of the French Enlightenment and 18th-century social and political history. His thoughts on love, the arts, gender, and politics. GER:3b (DR:9)  
5 units, Aut (Okin)

158F. Theater in France—(Same as Drama 158F.) The myth of Don Juan and its representation in literature. Analysis of French authors and comparative literature. Comparison with other French theatrical presentations. Frequent visits to the theater. GER:3a (DR:7)  
4 units, Aut (Mercier)

167X. Gender Development and Women’s Human Rights—(Same as Political Science 167X.) The intersections of gender and development theory and practice. The evolution of development theory and parallel growth of feminist critiques. The effects of economic, social, educational, environmental, and political development policies on women. The development of the international movement for the recognition of women’s rights in the context of cultural and religious diversity. Examples from Asia, Africa, Latin America, and the Middle East. GER:3b,4c (DR:91)  
units to be announced, Aut (Okin)

184B. Art and Science of Creativity—(Same as Psychology 184B.) Theories of creativity, case studies of eminent creators, laboratory studies, and an introduction to techniques to foster creative thinking. Is talent innate or developed? What are the personal traits for a person to be creative? Which processes lead to a creative product? (In French and English) GER:3b (DR:9)  
4 units, Aut (Getz, Lubart)

186F. Contemporary African Literature in French—(Same as French and Italian 186F.) Focus is on African writers and those of the Diaspora, bound together by a common history of slave trade, bondage, colonization, and racism. Their works belong to the past, seeking to save an oral heritage of proverbs, story tales, and epics, but they are also strikingly contemporary. GER:3a (DR:7)  
4 units, Win (Rullier)

211X. Political Attitudes and Behavior in Contemporary France—(Same as Political Science 211X.) The institutions of the Fifth Republic, the main political forces, and their evolution. Electoral behavior, taking into account other forms of political action such as the demonstrations for the defense of schools (1984) and the “lycee” students (1990), or the protest that followed the desecration of the Jewish cemetery in Carpentras. Attitudes and values are linked to voting choice. (In French and English) GER:3b (DR:9)  
4-5 units, Aut (Mayer)

MULTISITE COURSE

See the “Berlin” section of Overseas Studies Program for course descriptions.

91. Literary Institutions: A Comparative Approach—(Same as Comparative Literature 91, German Studies 126A.) GER:3a (DR:7)  
4 units, Win (Berman)

FRENCH LANGUAGE PROGRAM

22P. Intermediate French I—(Same as French 22P.)  
5 units, Aut (Mercier)

23P. Intermediate French II—(Same as French 23P.)  
5 units, Aut (Tardé)  
Win (Mercier)

124P. Advanced French I—(Same as French 124P.)  
5 units, Aut, Win (Riccì)

195P. Intermediate French III—(Same as French 195P.)  
3 units, Win (Manent)

ON VIDEO TAPE

50P. Introductory Science of Materials—(Same as Engineering 50P.)  
GER:2b (DR:6)  
4 units, Aut, Win (Bravman)

PUEBLA

The Puebla program has distinct academic focal points: development economics, cultural studies, and studio art. Students are expected to have completed significant prerequisite course work.

15. Research Project—Students may enroll in an individual research project and work one-on-one with an UDLA faculty member.  
2-3 units, Win (Staff)

16. Writing Workshop—Preparation for writing academic papers in Spanish.  
2 units, Win (Staff)

104X. Cholula: The Workings of a Sacred City—(Same as Latin American Studies 104X, Cultural and Social Anthropology 71X.) Cho-
lula is perhaps the oldest living city in the Americas. The social, ethnic, religious, historic, economic, and political factors that give it its identity as a part of the Mexican nation. Practical hands-on program requires student participation in social welfare programs, planning and development, town festivals, and ongoing research. Cholula’s role in rural and urban Mexico; the agricultural and industrial economies; the social and religious systems; and its cultural and historical heritage in relation to the regional, national, and global systems of which Cholula is a part. (In Spanish) GER:3b (DR:9)

3 units, Win (Knab)

105X. Mexico: Explaining Change in an Era of Globalization—(Same as Latin American Studies 105X.) Political, social, and cultural changes in Mexico in the 1990s. The roots of these changes, focusing on the external force of globalization. Globalization and internal change. The relationship between government and political figures. (In Spanish) GER:3b (DR:9)

3 units, Win (Knab)

109X. Competitiveness and Corporate Governance of Latin American Firms—(Same as Economics 109X.) The main features of large Mexican firms are described to establish if the observed structure fits with the stylized facts of the “Business Groups.” A theory of centralized governance is applied to the networks of the Mexican conglomerates. Concerns with respect to the competitiveness of these business networks in the context of a global economy. GER:3b (DR:9)

3 units, Win (Cárdenas)

STUDIO ART AND ART HISTORY

By arrangement with the Department of Art and Art History at Stanford, students may select from specified Art History and Studio Art courses offered through the Universidad de las Américas. (In Spanish)

50Y. Clay Modeling—(Same as Studio Art 50Y.) The study and construction of geometrical forms in relation to the human figure. Topics: knowledge and manipulation of the tools and the materials, realization of molds and fillings, and different finishing treatments for the figures.

3 units, Win (Staff)

143Y. Paper Making—(Same as Studio Art 143Y.) The different artistic and conceptual techniques of artificial and natural fibers in order to make paper. Topics: the history of paper, technical analysis and properties of fibers, and different methods of dying natural and artificial fibers.

3 units, Win (Staff)

145Y. Painting—(Same as Studio Art 145Y.) The use and preparation of tempera and oil paint, and the preparation of the canvas. Topics: techniques used to apply paint, painting of real life objects, and composition.

3 units, Win (Staff)

190Y. Popular Mexican Art—(Same as Art and Art History 190Y.) The popular artistic expressions of different regions of Mexico and eras, including prehispanic, colonial, 19th century, and contemporary. Present artistic expressions within their ethnic, historical, social, economic, and cultural scope. GER:3a (DR:7)

4 units, Win (Staff)
can Studies 117X.) Chile’s impressive strides towards becoming a developed country have engendered high levels of alienation and disaffection among significant sectors of the population. The roots of this apparent “paradox of modernization,” focusing on newly emerging actors in the Chilean political scene: Mapuche organizations, women’s groups, the environmental movement, and new features of the established ones like trade unions and human rights activists. GER:3b (DR:9)

118X. Cultural Modernization: The Case of Chile—(Same as Latin American Studies 118X, Spanish 1665S.) The cultural changes that have taken place in Chile under conditions of economic liberalization and political democratization at all three levels of culture: elite, mass-media, and popular or folk. The reception of cultural meanings from the world social system (the U.S., EU, and Japan), its reformulation to respond to local conditions, and its export under the shape of cultural artifacts that can be understood by the non-Latin American members. Innovative elements rooted in the regional-local culture. GER:3b (DR:9)

120X. Modernization and Culture in Latin America—(Same as Latin American Studies 120X, Spanish 290Z, Cultural and Social Anthropology 104X.) The intellectual and cultural expressions of Latin America against the background of modernization. Latin American modernization as a constant tension between: rationalization and subjectification, change and identity preservation, and the logic of economic development and the logic of the culture. GER:3a (DR:7)

129X. Latin America in the International System—(Same as Latin American Studies 129X, Political Science 137X.) Latin America’s role in world politics, with emphasis on U.S.-Latin American relations: the history of U.S.-Latin American interactions, national interest in the definition, and models for explaining U.S.-Latin American relations. Important themes in Latin America’s evolving relationship in the international system. GER:3b (DR:9)

130X. Latin American Economies in Transition—(Same as Latin American Studies 130X, Economics 165X.) Introduction to the main debates and approaches developed to understand and analyze the economies of Latin America. Recent processes of transition to market economies. Common characteristics among countries of the region; the differences and special traits of individual countries. Historical, analytical, and empirical perspectives on topics at the center of controversies and specific policy problems over several decades. Recommended: Economics 1, 51, and 52. GER:3b (DR:9)

141X. Politics and Culture in Chile—(Same as Latin American Studies 141X.) The relationship between politics and culture in Chile during the 20th century, reflecting on the incidence of such relationships on esthetics and identity. The possibility, that in Chile, culture has been pulled by politics and social praxis, a condition that has created a deficit in cultural thickness. The oligarchic regime around 1920, the welfare state around 1940, projects of social transformation around 1970, dictatorship around 1980, women writers and Mapuche poetry in contemporary Chile. GER:3a (DR:7)


162X. Core Seminar: Ecology-Policy Studies—(Same as Latin American Studies 162X.) Students are provided the intellectual depth and background to carry on research in the field, exposing them to the environment of functioning research groups.

5 units, Win (Hajek)

221X. Political Transition and Democratic Consolidation: Chile in Comparative Perspective—(Same as Political Science 221X.) The dynamics of the Chilean transition, considered by many observers among the most analytically interesting. Topics: the challenges faced by democratic governments in 1990s, framed by the legacy of military rule (1973-1990); the country’s political culture; institutional traditions of democracy in Chile; and the Chilean process within the broader context of Latin American political development. GER:3b (DR:9)

5 units, Aut (Heine)

MULTISITE COURSE

See the "Berlin" section of Overseas Studies Program for course descriptions

91. Literary Institutions: A Comparative Approach—(Same as Comparative Literature 91, German Studies 126A.) GER:3a (DR:7)

4 units, Win (Berman)

PHILOSOPHY

Emeriti: (Professors): Fred Dretske, Stuart Hampshire, Georg Kreisel, David S. Nivison, Patrick Suppes, James O. Urmson

Chair: to be announced

Director of Graduate Study: Mark Crimmins

Director of Undergraduate Study: John Perry

Professors: Michael Bratman (on leave), John Etchemendy, Solomon Feferman, Dagfinn Føllesdal (Autumn), Grigori Mints, Julius Moravcsik, John Perry, Johan van Benthem (Spring), Thomas Wason, Allen Wood

Associate Professors: Mark Crimmins, Peter Godfrey-Smith, Debra Satz, Kenneth Taylor (on leave)

Assistant Professors: Lanier Anderson (on leave), Chris Bobonich, Yair Guttmann, Nadeem Hussain, Agnieszka Jaworska, Krista Lawlor, Tamar Schapiro, Michael Strevens

Professor (Research): Rega Wood

Courtesy Professors: Denis Phillips, Richard Rorty

Courtesy Assistant Professor: Reviel Netz

Lecturer: David Barker-Plummer

Acting Associate Professor: David Hills

Acting Assistant Professor: Jennifer Rosner

Visiting Professors: Helmut A. Schwichtenberg, Wolfgang Welsch

Philosophy concerns itself with fundamental problems. Some are abstract and deal with the nature of truth, justice, value, and knowledge; others are more concrete and their study may help guide our conduct and enhance our understanding of other subjects. In addition, philosophy examines the efforts of past thinkers to understand the world and our experience of it.

Although it may appear to be an assortment of different disciplines, there are features common to all philosophical enquiry. These include an emphasis on methods of reasoning and the way in which our judgments are formed, on criticizing and organizing our beliefs, and on the nature and role of fundamental concepts.

Students of almost any discipline can find something in philosophy which is relevant to their own specialties. In the sciences, it provides a framework within which the foundations and scope of a scientific theory can be studied, and it may even suggest directions for future development. Since philosophical ideas have had an important influence on human endeavors of all kinds (artistic, political, even economic), students of the humanities will find their understanding deepened by some acquaintance with philosophy.
Philosophy is an excellent major for those planning a career in law, medicine, or business. It provides analytical skills and a breadth of perspective helpful to those called upon to make decisions about their own conduct and the welfare of others. Philosophy majors who have carefully planned their undergraduate program have an excellent record of admission to professional and graduate schools.

The Special Program in the History and Philosophy of Science enables students to combine interests in science, history, and philosophy. Students interested in this program should see the special adviser.

The joint major in Philosophy and Religious Studies combines courses from both departments into a coherent theoretical pattern.

The Tanner Memorial Library of Philosophy contains an excellent working library and ideal conditions for study.

Graduate students and undergraduate majors in philosophy have formed associations for discussion of philosophical issues and the reading of papers by students, faculty, and visitors. These associations elect student representatives to department meetings.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

There are two ways of majoring in philosophy: the "General Program" and the "Special Program in the History and Philosophy of Science." A student completing either of these receives an A.B. degree in Philosophy. There is also a major program offered jointly with the Department of Religious Studies. To declare a major, a student must consult with the Director of Undergraduate Study. The student is assigned an adviser to work out a coherent plan. The department strongly urges proficiency in at least one foreign language.

GENERAL PROGRAM

1. Course requirements, minimum 55 units:
   a) Preparation for the major: an introductory course (under 100) and 80. Students taking both quarters of the winter/spring philosophy Introduction to the Humanities (IHUM) track can count 5 units toward the introductory philosophy requirement.
   b) The core (affiliated department courses may not be used to satisfy core requirements): 24 additional Philosophy units as follows
      1) Logic: one from 57, 159, 160A, 169
      2) Philosophy of Science: any course from 60, 61, 156, 163-168
      3) Moral and Political Philosophy: one from 170-173
      4) Metaphysics and Epistemology: one from 180-188
      5) History of Philosophy: two history of philosophy courses numbered 100 or above
   c) One undergraduate philosophy seminar from the 194 series.
   d) Electives: courses numbered 10 or above, at least 13 units of which must be in courses numbered above 99.

2. Units for Tutorial, Directed Reading, or The Dualist (Philosophy 196, 197, 198) may not be counted in the 55-unit requirement. No more than 10 units completed with grades of "Satisfactory" may be counted in the 55-unit requirement.

3. A maximum of 10 transfer units or two courses can be used for the major.

   a) A history of philosophy course numbered 100 or above
   b) Two quarters of Area 1 (only 5 of the 10 units can count towards 30-unit requirement)

4. One course from any two of the following three areas:
   a) Philosophy of science and logic: 60, 61, 156, 163-168; 57, 59, 160A, 169
   b) Moral and political philosophy: 20, 30, 170-172
   c) Metaphysics and epistemology: 10, 80, 180-188

5. Units for tutorials and directed reading may not be counted.

6. Transfer units must be approved in writing by the Director of Undergraduate Study at the time of declaring. Transfer courses are strictly limited when used to satisfy major requirements.

MINORS

A minor in Philosophy consists of at least 30 units of philosophy courses satisfying the following conditions:

1. Introduction to the Humanities Program 23A and 23B (Reason, Passion and Reality) may be counted for a maximum of 5 units.

2. At least 10 units must be from courses numbered 100 or above.

3. The 30 units must include one of:
   a) A history of philosophy course numbered 100 or above
   b) Two quarters of Area 1 (only 5 of the 10 units can count towards 30-unit requirement)

4. One course from any two of the following three areas:
   a) Philosophy of science and logic: 60, 61, 156, 163-168; 57, 59, 160A, 169
   b) Moral and political philosophy: 20, 30, 170-172
   c) Metaphysics and epistemology: 10, 80, 180-188

5. Units for tutorials and directed reading may not be counted.

6. Transfer units must be approved in writing by the Director of Undergraduate Study at the time of declaring. The number of transfer units is generally limited to a maximum of 10.

7. No more than 6 units completed with grades of "Satisfactory" count towards the 30-unit requirement.

As with the Philosophy major, these courses need not be taken in any particular order.

Students must declare their intention to minor in Philosophy in a meeting with the Director of Undergraduate Studies. This formal declaration must be made no later than the last day of the quarter two quarters before degree conferral. The Department of Philosophy lists courses taken and be taken to fulfill minor requirements. This permission is on file in the department office. Before graduation, a student’s record is checked to see that requirements have been fulfilled, and the results are reported to the University Registrar.

HONORS PROGRAM

Students who wish to undertake a more intensive and extensive program of study, including seminars and independent work, are invited to apply for the honors program during Winter Quarter of the junior year. Admission is selective on the basis of grade point average (GPA), demonstrated ability in philosophy, and progress towards satisfying the requirements of the major.

With their application, candidates should submit an intended plan of study for the remainder of the junior and the senior years. It should include at least 5 units of Senior Tutorial (196) during Autumn and/or Winter quarters of the senior year. In the quarter preceding the tutori-

The joint major in Philosophy and Religious Studies consists of 60 units of course work with approximately one third each in the philosophy core, the religious studies core, and either the general major or the special concentration.

No courses in either the philosophy or religious studies core may be taken satisfactory/no credit.

In general, transfer units cannot be used to satisfy the core requirements. Transfer units and substitutions must be approved in writing by the department. Each student must also take at least one undergraduate seminar in Philosophy and one undergraduate seminar in Religious Studies.

Special Concentration—With the aid of an adviser, students pursue a specialized form of inquiry in which the combined departments have strength; for example, American philosophy and religious thought, philosophical and religious theories of human nature and action, philosophy of religion. Courses for this concentration must be approved in writing by the adviser.

Directed Reading and Satisfactory/No Credit Units—Units of directed reading for fulfilling requirements of the joint major are allowed only with special permission. No more than 10 units of work with a grade of "Satisfactory" count toward the joint major.

H O N O R S  P R O G R A M

Students pursuing a joint major in Philosophy and Religious Studies may also apply for honors by following the procedure for honors in either of the departments.

C O T E R M I N A L  D E G R E E

It is possible to earn an A.M. in Philosophy while earning an A.B. or B.S. This can usually be done by the end of the fifth undergraduate year, although students whose degree is not in philosophy may require an additional year. Standards for admission to, and completion of, this program are the same as for A.M. applicants who already have the bachelor's degree when matriculating. Applicants for the coterminal program are not, however, required to take the Graduate Record Exam. Information about application is available from Degree Progress in the Registrar's Office.

G R A D U A T E  P R O G R A M S

The department is prepared to direct and supervise individual study and research to supplement instruction offered in the courses listed below. In addition, advanced seminars not listed in the catalog are frequently organized in response to student interest. Candidates for advanced degrees are urged to discuss their entire program of study with their department advisers as early as possible.

Applications to graduate programs in the Department of Philosophy can be obtained from Graduate Admissions, the Registrar's Office. Applicants must take the Graduate Record Examination by October of the year the application is submitted.

M A S T E R  O F  A R T S

University requirements for the A.M. are discussed in the "Graduate Degrees" section of this bulletin.

Four programs lead to the A.M. in Philosophy. One is a general program providing a grounding in all branches of the subject. The others provide special training in one branch.

Admissions—All prospective master's students, including those currently enrolled in other Stanford programs, must apply for admission to the program. The application deadline is April 1 of the academic year preceding entry into the program. In exceptional circumstances, consideration may be given to applications received after the April 1 deadline but before April 30. No fellowships are available. Entering students must meet with the director of the master's program and have their advisers' approval, in writing, of program proposals. The master's program should not be considered a stepping-stone to the doctoral program; these two programs are separate and distinct.

Unit Requirements—Each program requires a minimum of 36 units in philosophy. Students in a special program may be allowed or required to replace up to 9 units of philosophy by 9 units in the field of specialization. Although the requirements for the A.M. are designed so that a student with the equivalent of a strong undergraduate philosophy major at Stanford might complete them in one year, most students need longer. Students should also keep in mind that although 36 units is the minimum required by the University, quite often more units are necessary to complete department requirements. Up to 6 units of directed reading in philosophy may be allowed. There is no thesis requirement, but an optional master's thesis or project, upon faculty approval, may count as the equivalent of up to 8 units. A special program may require knowledge of a foreign language. At least 36 units in courses numbered 100 or above must be completed with a grade of 'B-' or better at Stanford. Students are reminded of the University requirements for advanced degrees, and particularly of the fact that for the A.M., students must complete three full quarters as measured by tuition payment.

G E N E R A L  P R O G R A M

The General Program requires a minimum of 36 units in Philosophy courses numbered above 99. These courses must be taken for a letter grade and the student must receive at least a "B-" in the course. Courses taken to satisfy the "undergraduate core" may not be counted in the 36 units. The requirement has three parts:

1. Undergraduate Core: students must have when they enter, or complete early in their program, the following undergraduate courses (students entering from other institutions should establish equivalent requirements with a master's adviser upon arrival or earlier):
2. Students must take at least one course numbered over 100 or above.

3. Remaining courses are to be chosen in consultation with and approved by an adviser.

SPECIAL PROGRAM IN THE PHILOSOPHY OF LANGUAGE

Admission is limited to students with substantial preparation in philosophy or linguistics. Those whose primary preparation has been in linguistics may be required to satisfy all or part of the undergraduate core requirements as described in the General Program. Those whose preparation is primarily in philosophy may be required to take additional courses in linguistics.

COURSE REQUIREMENTS

1. Philosophy of language: two approved courses in the philosophy of language numbered 180 or higher.
3. Logic: at least two approved courses numbered 160A or higher.
4. An approved graduate-level course in mathematical linguistics or automata theory.

DOCTOR OF PHILOSOPHY

The University's basic requirements for the Ph.D. degree (residence, dissertation, examination, and so on) are discussed in the "Graduate Degrees" section of this bulletin. The requirements detailed here are department requirements.

There are six basic areas (philosophy of science, ethics, metaphysics and epistemology, philosophy of language, logic, and history) in which students should have proficiency in order to obtain a Ph.D. Demonstrating proficiency takes the form of course work, intensive seminars, and papers, as detailed below.

1. Philosophy of language: two approved courses in the philosophy of language numbered 180 or higher.
3. Logic: at least two approved courses numbered 160A or higher.
4. An approved graduate-level course in mathematical linguistics or automata theory.

PROFICIENCY REQUIREMENTS

1. Course requirements, to be completed during the first two years:
   a) Seven of the eight items listed below:
      1) Four "core" graduate courses and seminars in philosophy of language (281); philosophy of mind, metaphysics, and epistemology (280); theory of science (260). To enroll, the student must be a Ph.D. student in Philosophy or have special permission of the instructor.
      2) Three history courses, each consisting of an approved graduate-level course in the history of philosophy. Courses satisfying this seven-out-of-eight requirement must include at least one history course in ancient philosophy, one in modern.
   b) Philosophy 159 or the equivalent.
   c) Breadth requirement: a course in Eastern or Continental philosophy, or some other course establishing breadth.
   d) A total of at least 39 units of course work in the Department of Philosophy numbered above 110, but not including Teaching Methods (Philosophy 239). Units of Individual Directed Reading (Philosophy 240) may be included only with the explicit approval of the Director of Graduate Studies.
2. Teaching assistance: a minimum of four quarters of teaching assistance at 25 percent time, usually during the second and third years.
3. Candidacy: to continue in the Ph.D. program, each student must be approved for candidacy during the sixth academic quarter (normally the Spring Quarter of the student's second year). Students may be approved for candidacy on a conditional basis if they have only one year of graduate study remaining or if they have already completed a substantial portion of the degree requirements.
or two outstanding deficiencies, but are not officially advanced to candidacy until these deficiencies have been removed. Approval for candidacy indicates that, in the department's judgment, the student can successfully complete the Ph.D. In reaching this judgment, the department considers the overall quality of the student's work during the first six quarters and the student's success in fulfilling course requirements.

4. During the third year of graduate study, and after advancement to candidacy, a Ph.D. student should successfully complete at least three graduate-level courses/seminars, at least two of which must be in philosophy. Courses required for candidacy are not counted toward satisfaction of this requirement. Choice of courses/seminars outside philosophy is determined in consultation with a student's adviser.

5. During the summer of their second year, students are eligible to attend a Dissertation Development seminar given by the department.

6. Dissertation work and defense: the third and fourth (and sometimes fifth) years are devoted to dissertation work.

a) Dissertation Proposal: by Spring Quarter of the third year, students select a dissertation topic, a reading committee, and some possible thesis relative to that topic. The topic and thesis should be sketched in a proposal of three to five pages, plus a detailed, annotated bibliography indicating familiarity with the relevant literature. The proposal should be approved by the reading committee before the meeting on graduate student progress late in Spring Quarter.

b) Departmental Oral: during Autumn Quarter of the fourth year, students take an oral examination, called the "Departmental Oral," based on at least 30 pages of written work, in addition to the proposal. The aim of the exam is to help the student arrive at an acceptable plan for the dissertation and to make sure that the student, thesis, topic, and adviser make a reasonable fit. In cases where such an exam is deemed inappropriate by the reading committee, the student may be exempted by filing a petition with the Director of Graduate Studies, signed by the student and the members of the reading committee.

c) Fourth-Year Colloquium: no later than the Spring Quarter of the fourth year, students present a research paper in a seminar open to the entire department. This paper should be on an aspect of the student's dissertation research.

d) University Oral Exam: Ph.D. students must submit a completed draft of the dissertation to the three-person reading committee at least one month before the student expects to defend the thesis in the University oral exam. If the student is given permission to go forward, the University orals take place approximately two weeks later. A portion of the exam consists of a student presentation based on the dissertation and is open to the public. A closed question period follows. If the draft is ready by Autumn Quarter of the fourth year, the student can request that the University oral count as the department oral.

SPECIAL GRADUATE PROGRAMS

The department recognizes that some students may need to spend a large amount of time preparing themselves in some other discipline related to their philosophical goals, or in advanced preparation in some area within philosophy. In such circumstances, the department may be willing to waive some of the Ph.D. requirements. Such an exemption is not automatic; a program must be worked out with an adviser and submitted to the department some time in the student's first year. This proposal must be in writing and must include:

1. The areas to be exempted (see below).
2. A program of additional courses and seminars in the special area (usually at least 12 units).
3. A justification of the program that considers both intellectual coherence and the student's goals.

The department believes there is plenty of room for normal specialization within the program as it stands, and that all students will specialize to some extent. Thus, the intent is not to exempt courses on a one-to-one basis, but only to grant exemptions when a student plans an extensive and intensive study of some relevant area.

Special-program students may be exempted from no more than two of the following:

1. One additional item from the items listed above in requirement 1(a)
2. Philosophy 159 (but then they must take Philosophy 57)
3. The breadth requirement

If a student's special program involves substantial course work outside of philosophy then, with the approval of the adviser, the student may petition the department to reduce requirement 1(d) (the Philosophy unit requirement for the first two years). Normally this requirement is not reduced below 32 units.

Ph.D. MINOR

To obtain a Ph.D. minor in Philosophy, students must follow the same procedures:

1. Consult with the Director of Graduate Studies to establish eligibility and select a suitable adviser.
2. Give to the department academic assistant a signed copy of the program of study (designed with the adviser) which offers:

a) 30 units of courses in the Department of Philosophy with a letter grade of 'B-' or better in each course. No more than 3 units of directed reading may be counted in the 30-unit requirement.

b) At least one course or seminar numbered over 99 to be taken in each of these five areas:

1) Logic
2) Philosophy of science
3) Ethics, value, theory, and moral and political philosophy
4) Metaphysics, epistemology, and philosophy of language
5) History of philosophy

c) Two additional courses numbered over 199 to be taken in one of those (b) five areas.

3. A faculty member from the Department of Philosophy (usually the student's adviser) serves on the student's doctoral oral examination committee and may request that up to one third of this examination be devoted to the minor subject.

4. Paperwork for the minor must be submitted to the department office before beginning the program.

INTERDEPARTMENTAL PROGRAMS

GRADUATE PROGRAM IN HUMANITIES

The Department of Philosophy also participates in the Graduate Program in Humanities leading to the joint Ph.D. degree in Philosophy and Humanities. It is described in the "Interdisciplinary Studies in Humanities" section of this bulletin.

GRADUATE PROGRAM IN COGNITIVE SCIENCE

Philosophy participates with the departments of Computer Science, Linguistics, and Psychology in an interdisciplinary program in Cognitive Science. It is intended to provide an interdisciplinary education, as well as a deeper concentration in philosophy, and is open to doctoral students. Students who complete the requirements within Philosophy and the Cognitive Science requirements receive a special designation in Cognitive Science along with the Ph.D. in Philosophy. To receive this field designation, students must complete 30 units of approved courses, 18 of which must be taken in two disciplines outside of philosophy. The list of approved courses can be obtained from the Cognitive Science program located in the Department of Psychology.

SPECIAL TRACK IN PHILOSOPHY AND SYMBOLIC SYSTEMS

Students interested in interdisciplinary work relating philosophy to artificial intelligence, cognitive science, computer science, linguistics, or logic may pursue a degree in this program.

Prerequisites—Ideally, admitted students have covered the equivalent of the core of the undergraduate Symbolic Systems Program requirements as described in that section of this bulletin, including courses in...
Courses of Study—The program consists of two years of courses and two years of dissertation work. Students are required to take the following courses in the first two years:

1. Six Philosophy courses:
   a) Two of the following: 260, 270, 280, 281
   b) One course in the history of modern philosophy
   c) Two quarters of graduate logic courses from among 290A, 291A, 292A, 293A
   d) At least one additional seminar in the general area of symbolic systems: that is, Philosophy 296, 382, 395, and so on

2. Five cognitive science and computer science courses:
   a) At least two courses in cognitive psychology
   b) Two or three graduate courses in computer science, at least one in AI and one in theory

3. Three linguistics and computational linguistics courses:
   a) Graduate courses on natural language that focus on two of the following areas: phonetics and phonology, syntax, semantics, or pragmatics
   b) One graduate course in computational linguistics, typically Linguistics 239

4. At least two additional graduate seminars at a more advanced level, in the general area of the program, independent of department. These would typically be in the area of the student’s proposed dissertation project.

The requirements for the third year are the same as for other third-year graduate students in philosophy: a dissertation proposal, creation of a dissertation committee, and at least three approved graduate courses and seminars. The dissertation committee must include at least one member of the Department of Philosophy and one member of the Program in Symbolic Systems outside the Department of Philosophy.

The requirement for the fourth year is the same as for the other graduate students in philosophy: a department oral on an initial draft of part of the dissertation, a fourth year colloquium, and a University oral exam when the dissertation is essentially complete.

GRADUATE FELLOWSHIPS AND ASSISTANTSHIPS

A limited amount of fellowship support is available for Ph.D. students in philosophy. Students request aid by checking the appropriate box on the application form. Details of this program may be obtained from the department. Note that a condition of financial aid may be teaching assistance that goes beyond the Ph.D. requirement.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

See the quarterly Time Schedule for revised listings.

INTRODUCTORY

These acquaint the student with some of the most important problems, positions, and methods in philosophy. Some are designed to give general preparation for further work in philosophy. Some apply the philosopher’s approach to particular problems and subjects encountered in other areas of study. In conjunction with the Introduction to Humanities Autumn Quarter course, courses 5A and B form an Area 1 sequence, sponsored by the Department of Philosophy as part of the Introduction to the Humanities Program. Either 5A or B may count as the introductory philosophy course requirement for the major.

5A,B. Reason, Passion, and Reality—(Enroll in Introduction to the Humanities 23A,B.)

5A.—GER:1 (DR:1)
5 units, Win (Bobonich, Moravcsik)

5B.—GER:1 (DR:1)
5 units, Spr (Huain, Schapiro)

10. God, Self, and World: An Introduction to Philosophy—Basic philosophical problems are introduced through the writings of classical and contemporary authors. Problems considered are: our knowledge of the external world; induction and causation; minds, machines, brains, and bodies; freedom and determinism; the meaning of life. Authors: Descartes, Hume, Russell, Nagel, Turing, Searle, etc. GER:3a (DR:8)
5 units, Aut (Perry)
Spr (Maguire)

11N. Stanford Introductory Seminar: Practical Norms—Preference to freshmen. Be good! Be reasonable! Be yourself! These are three standards we usually try to live up to. But what sorts of demands do they represent, and how are these demands related to one another? Is being good a matter of being altruistic? Is morality a matter of promoting your own interests? If this is the case, then morality and rationality may be in conflict. Is being yourself a matter of following your deepest desires? If this is the case, then authenticity may be in conflict with both morality and rationality. Several major philosophers have conceived of these three standards and the relations between them. GER:3a (DR:8)
3 units, Aut (Schapiro)

12N. Stanford Introductory Seminar: Gödel’s Theorem, Minds, and Machines—Preference to freshmen. An informal explanation of Gödel’s incompleteness theorem. Some philosophers and mathematicians have argued that Gödel’s theorem shows that the mind cannot be modeled computationally: the arguments pro and con. GER:3a (DR:8)
3 units, Aut (Feferman)

13N. Stanford Introductory Seminar: Moral Scepticisms—Preference to freshmen. Can morality be justified? Are moral claims true? Does it matter if they are not? Do we have reason to be moral? Do we have reason to be immoral? The writings of Friedrich Nietzsche are used as starting points for engagements with the works of contemporary philosophers. GER:3a (DR:8)
3 units, Win (Hussain)

14N. Stanford Introductory Seminar: Time and Meaning—Preference to freshmen. The nature of time and its meaning for humans. The existence of time, the flow of time, progress, recurrence, entropy, time travel, mortality, etc. Readings in philosophy, literature, and some elementary physics (no equations, no prior knowledge necessary). GER:3a (DR:8)
3 units, Win (Stevrens)

15N. Stanford Introductory Seminar: Mind, Reality, and Science—Preference to freshmen. Philosophical questions about the extent to which we can hope to attain genuine knowledge. Skepticism, relativism, empiricism and other threatening isms, reading from old and new texts. GER:3a (DR:8)
3 units, Spr (Crimmins)

20. Introduction to Moral Theory—What is the basis of our moral judgments? What makes right actions right, and wrong actions wrong? (Existing social rules? The consequences of human happiness? Conformity to a rule of reason?) What sort of person is it best to be? The answers to these classic questions about ethics are examined in the works of traditional and contemporary authors. GER:3b,4c (DR:9f)
5 units, Win (Perry)
philosophy. Topics: human nature and citizenship, the obligation to obey the law, democracy and economic inequality, equality of opportunity and affirmative action, religion and politics. Readings: Locke, Rousseau, Mill, Marx, Rawls, and some cases of practical application, including Supreme Court cases. GER:3a (DR:8)
4 units, Aut (Satz)

57. Logic, Reasoning, and Argumentation—Study of propositional and predicate logic, emphasizing translating English sentences into logical symbols and constructing derivations of valid arguments. GER:2c (DR:4)
5 units, Spr (Staff)

60. Introduction to the History and Philosophy of Science—(Same as History and Philosophy of Science 60.) Survey of 20th-century views on the nature of scientific knowledge. Logical positivism and Popper, the problem of induction; Kuhn, Feyerabend, and radical proposals of science; subsequent attempts to rebuild moderate empiricist and realist positions; case study in the history of biology. GER:3a (DR:8)
5 units, Spr (Godfrey-Smith)

74Q. Stanford Introductory Seminar: Ethical Aspects of Risk—Preference to sophomores.
3-5 units, Aut (Fellesdal)

77. The Ethics of Social Decisions: Issues in Surrogate Decision-Making—(Same as Ethics in Society 77.) Decision-making for others as it occurs in governmental representation and in the advocacy of children, the physically and mentally ill, animals, and the environment.
4 units, Spr (Rosner)

78. Medical Ethics—Introduction to moral reasoning and its application to problems in medicine: informed consent, confidentiality in the physician-patient relationship, abortion, euthanasia, and physician-assisted suicide. GER:3a (DR:8)
4 units, Spr (Jaworska)

80. Mind, Matter, and Meaning—Intensive survey of some central and perennial topics in philosophy: free will and determinism, the mind-body problem, innate ideas, and personal identity. Prerequisite: one course in philosophy other than logic. GER:3a (DR:8) (WIM)
5 units, Win (Lawlor)

HISTORY OF PHILOSOPHY

100-103 are surveys of important figures and movements in Western philosophy. Other courses cover particular periods, movements, and figures in the history of philosophy. Prospective philosophy majors should take as many as possible during the sophomore year.

100. Greek Philosophy—Greek philosophical thought, covering Socrates, Plato, Aristotle, and the Hellenistic schools (the Epicureans, the Stoics, and the Skeptics). Topics: the nature of the soul, virtue and happiness, knowledge, and reality. GER:3a (DR:8)
4 units, Aut (Bobonich)

4 units, Spr (Gelber)

102. Modern Philosophy, Descartes to Kant—Introduction to the thought of major figures in early modern philosophy in the areas of epistemology, metaphysics, and philosophy of mind. Selected writings of Descartes, Locke, Leibniz, Berkeley, Hume, and Kant. GER:3a (DR:8)
4 units, Win (A. Wood)

103. 19th-Century Philosophy—Introduction to some of the major thinkers and problems in European and American philosophy in the 19th century. Interpretations of works by Hegel, Marx, Nietzsche, Emerson, Veblen, and Thoreau, focusing on the comparative study of notions of self (e.g., alienation, authenticity, and genius), labor, property, economy, and history.
4 units, not given 2000-01

107. The Experience of Blackness—The Black American self in literature and philosophy from the mid-19th century through the 20th century. Race, class, and gender as social constructions that influence the constitution and material production of self. What is the existential condition, the social situation, and the material circumstance that represents the experience of blackness? The development of a racialized identity within the context of pre- and post-emancipation America.
Authors: Douglass, Stowe, DuBois, Washington, Ellison, Hurston, Morrison, P. H. Collins, George Fredrickson, etc.
4 units, Win (Watson)

112/212. Socrates’ Philosophy—(Graduate students register for 212.) Socrates’ main philosophical theses and his method of argument.
4 units, not given 2000-01

115/215. Parmenides—(Graduate students register for 215.) Examination of ancient and modern monism. Prerequisite: 100 or classics equivalent.
4 units, Aut (Moravcsik)

116/216. Plato's Philosophy: Eros, Mathematics, and Reality—A Reading of Plato—(Graduate students register for 216.) Two routes led Plato into higher reality: eros (Symposium, Phaedrus) and mathematics (Republic, Timea). By following the two routes, students understand what Plato’s higher reality was like.
4 units, Win (Moravcsik, Netz)

117/217. Aristotle’s Philosophy—(Graduate students register for 217.) Central doctrines in Aristotle’s metaphysics.
4 units, not given 2000-01

118. Hellenistic Philosophy—The epistemology, metaphysics, and ethics of the main Hellenistic schools: the Epicureans, the Skeptics, and the Stoics.
4 units (Bobonich) not given 2000-01

121/221. Descartes—(Graduate students register for 221.) Descartes’s philosophy is fundamental to modern Western thought. His views, focusing on mind-body dualism. Descartes’s novel way of distinguishing between the corporeal and the incorporeal. Why he adopted his form of dualism and various problems for this view. Related questions about science, religion, and knowledge.
4 units, not given 2000-01

125/225. Kant’s Critique of Pure Reason—(Graduate students register for 225.) In-depth study of Kant’s greatest work. Selections also from Kant’s Prolegomena to Any Future Metaphysics that May Be Able to Come Forwards as a Science, and secondary literature.
4-5 units, not given 2000-01

126/226. Kant’s Ethics—(Graduate students register for 226.) Introduction to Kant’s ethical theory through the study of Groundwork for the Metaphysics of Morals (1785) and other writings, e.g., Idea for a Universal History with a Cosmopolitan Aim (1784), Religion within the Boundaries of Mere Reason (1794) and Metaphysics of Morals (1798).
4 units, Win (A. Wood)

128. Hobbes—Written during the English Civil War, Hobbes’ Leviathan (1651) attempts to ground obligations of obedience to an absolute state by synthesizing views of science, morality, and religion. Focus on interpreting and analyzing this work; close reading of Leviathan and present-day commentary.
4 units, not given 2000-01
129/229. Pragmatism—(Graduate students register for 229.) Introduction to Pierce, James, Dewey, and some recent writers such as Rorty. Focus is on questions of truth, belief, knowledge, and the nature of philosophical inquiry.
4 units, not given 2000-01

131/231. The Structure of Cognition: Introduction to Husserl’s Phenomenology—(Graduate students register for 231.) Its background and basic concepts. Emphasis is on the concept of intentionality, and its role in Husserl’s theory and in contemporary philosophical debates.
4 units, not given 2000-01

132/232. Existentialism—(Graduate students register for 232.) Exploration of central existentialist questions (e.g., what constitutes authentic individuality? what is our relation to the divine? how can one live a meaningful life? what is the significance of death?) through the existentialist preoccupation with human freedom. A rethinking of the traditional problem of freedom and determinism in readings from Rousseau, Kierkegaard, and Nietzsche, and the extension of these ideas by Sartre, Beauvoir, and Camus, including their social and political consequences in light of 20th-century fascism and feminism.
4 units, not given 2000-01

133/233. Major Figures in 20th-Century Philosophy—(Graduate students register for 233.) Discussion in depth of the key ideas of some of the main 20th-century thinkers: Husserl, Heidegger, Sartre, Gadamer, Wittgenstein, Quine, Davidson, and Rawls. Readings from the their central writings.
4 units, Aut (Follesdal)

134/234. Phenomenology and the Background of Continental Philosophy—(Graduate students register for 234.) Presentation and critical discussion of Husserl’s phenomenology as a key to understanding contemporary continental philosophy, notably Heidegger’s and Sartre’s existentialisms, Gadamer’s hermeneutics, and recent trends in contemporary German and French philosophy. The role of intentionality in contemporary debates in cognitive science.
4 units (Follesdal) not given 2000-01

LOGIC AND PHILOSOPHY OF SCIENCE

155. Concepts of Freedom—Historical and current concepts of freedom. The views of Hume, Kant, Mill, A. V. Dicey, and Hayek; recent works, including economic concepts of freedom.
4 units (Follesdal, Suppes) not given 2000-01

156. Popper, Kuhn, and Lakatos—(Same as Education 214.) Popper, Kuhn, and Lakatos are 20th-century philosophers of science who have raised fundamental issues dealing with the nature of scientific progress: the rationality of change of scientific belief—science vs. non-science; the role of induction in science; truth or verisimilitude as regulative ideals. Their impact in the social sciences and applied areas such as educational research.
3 units, Spr (Phillips)

159. Basic Concepts in Mathematical Logic—The concepts and techniques used in mathematical logic, primarily through the study of the language of first-order logic. Topics: formalization, proof, propositional logic, quantifiers, sets, mathematical induction, and enumerability.
GER:2c (DR:4)
4 units, Aut (Barker-Plummer)

160A. First-Order Logic—The syntax and semantics of sentential and first-order logic. Introduction to the basic concepts of model theory. Gödel’s Completeness Theorem and its consequences: the Löwenheim-Skolem Theorem and the Compactness Theorem. Prerequisite: 159 or consent of instructor.
4 units, Win (Mints)

160B. Computability and Logic—Different approaches to effective computation: recursive functions, register machines, and various programming styles. Proof of their equivalence, discussion of Church’s Thesis. Development of some elementary recursion theory. These techniques are used to prove Gödel’s Incompleteness Theorem for arithmetic, whose technical and philosophical repercussions are surveyed. Prerequisite: 160A.
4 units, Spr (Mints)

162/262. Philosophy of Mathematics—(Graduate students register for 262.) Introduction to 20th-century approaches to the foundations and philosophy of mathematics. The background in mathematics, set theory, and logic. The schools and programs of logicism, predicativism, platonism, formalism, and constructivism. Readings from leading thinkers. Prerequisite: 160A or consent of the instructor.
4 units, Win (Feferman)

163. Philosophy of Statistics—Introduction to and definition of the concept of probability in a philosophically motivated fashion. Emphasis is on the use of probabilities for decision-making under uncertainty.
4 units, not given 2000-01

164/264. Central Topics in the Philosophy of Science: Theory and Evidence—(Graduate students register for 264.) What counts as evidence for a scientific theory? What counts as evidence for the existence of unobservable entities? Topics: inductive logic, the paradoxes of confirmation, the new riddle of induction, hypothetico-deductivism, boot-strapping, Bayesianism, inference to the best explanation, falsificationism. Recommended: 60 or 80.
4 units, Aut (Strevens)

165/265. Philosophy of Physics—(Graduate students register for 265.) The philosophy of quantum mechanics. What is a superposition? The measurement problem (Schrödinger’s cat, etc.). Modern approaches to the problem: the many worlds and many minds theories, the GRW theory, Bohm’s theory.
4 units, Win (Strevens)

167A/267A. Philosophy of Biology—(Graduate students register for 267A.) Questions about explanation and theory construction in evolutionary biology. Analysis of key concepts: adaptation, function, units of selection, species.
4 units (Godfrey-Smith) not given 2000-01

167B/267B. Philosophy, Biology, and Behavior—(Graduate students register for 267B.) Continuation of 167A/267A. Further philosophical study of some key theoretical ideas in biology, focusing on problems involving explanation of behavior. Topics: altruism, group selection, genetic determinism. Prerequisite: 167A (students with some philosophy background and Biological Sciences or Human Biology core, or equivalent, admitted with consent of instructor).
4 units (Godfrey-Smith) not given 2000-01

168/268. Theories of Truth—(Graduate students register for 268.) The correspondence, coherence, pragmatist, and deflationary theories of truth. Tarski’s semantic conception of truth. The problems posed by the Liar Paradox. Introduction to formal theories of truth proposed by philosophical logicians (e.g., Kripke, Gupta and Belnap, McGee, and Barwise and Etchemendy) in the last few decades. Prerequisite: 160A or equivalent.
4 units, not given 2000-01

169. Intensional Logic—Logical analysis of intensional notions like modality, time, conditionals, knowledge, and action, starting from their philosophical background. Introduction to the modern notions and methods of modal logic, including a choice of recent applications to computer science, AI, linguistics, and mathematics.
4 units, Spr (van Benthem)
ETHICS, AESTHETICS, AND SOCIAL AND POLITICAL PHILOSOPHY

170. Ethical Theory—Detailed study of Mill’s Utilitarianism and Kant’s Grounding for the Metaphysics of Morals. Emphasis is on the contrast between utilitarianism and Kantianism concerning specific moral requirements, conception of moral responsibility, theory of value, and the answer to the question “why should I be moral?”
4 units, Win (Jaworska)

171. Political Philosophy—Liberalism and its critics. Individual and group rights. The ability of liberal political theory to respond to critics’ attacks on its methodological and psychological foundations and on its core values.
4 units, Aut (Hussain)

4 units, Aut (Schapiro)

173. Philosophical Aesthetics: Metaphor across the Arts—What if metaphors are compact works of art? What if finding a metaphor is a special case of finding a thing aesthetically valuable? The philosophical study of art and aesthetic value, organized around metaphor as a case study.
4 units, Win (Hills)

174. The Bounds of Moral and Political Obligation—How far do our moral and political obligations extend? Inclusion and exclusion on the basis of national borders, ethnicity, species designation, and other factors.
4 units, Win (Rosner)

175. Feminist Practical Ethics—Over the last two decades, feminist philosophers and political theorists have been developing and refining a variety of feminist approaches to public policy issues. The controversies that have emerged between feminists over affirmative action, reproductive technologies, and pornography and sex work, militarism, the environment, and other issues of contemporary social concern. GER:4c (DR:†)
4 units, not given 2000-01

176/276. Political Philosophy: The Special Contract Tradition—Why and under what conditions do human beings need political institutions? What makes them legitimate or illegitimate? What is the nature, source, and extent of our obligation to obey the legitimate ones, and how should we alter or overthrow the others? Critical study of the answers by political theorists of the early modern period: Hobbes, Locke, Rousseau, and Kant.
4 units, Win (Hills)

177. Philosophical Issues Concerning Race and Racism—Concepts of race, race consciousness, and racism and their connections. What is “race” and what is its role in racism? How should we view ethnic and racial identities if we wish to secure the conditions in which humanity can be viewed as a single moral community whose members have equal respect? What laws, values, and institutions best embody the balance between the competing goals of group loyalty, opposition to racism, and common humanity? Philosophical writings on freedom and equality, human rights, pluralism, and affirmative action. Historical accounts of group exclusion and various explanations. GER:4b (DR:3)
4 units, Spr (Satz)

178. Ethics in Society Honors Seminar—(Same as Ethics in Society 190.) Interdisciplinary. Students present issues of public and personal morality; topics are chosen with the advice of the instructor. Student-prepared reading list is made available a week prior to the presentation. Group discussion follows.
3 units, Win (Reich)

179. Individual and Communal Ethics—Explorations of interactions between individual and communal well-being.
4 units, Spr (Moravcsik)

EPISTEMOLOGY, METAPHYSICS, PHILOSOPHY OF MIND, AND PHILOSOPHY OF LANGUAGE

181. Philosophy of Language—Notions of meaning, reference, and language use, with relations to psycholinguistics and formal semantics. Prerequisites: 80 and some background in logic.
4 units, Win (Crimmins)

183/283. Meaning and Experience—(Graduate students register for 283.) Interrelationships between meaning and experience, emphasizing how our judgments concerning meaning may be based on empirical evidence. Philosophers: W. V. Quine and Donald Davidson. Recommended: some acquaintance with the philosophy of language.
4 units, not given 2000-01

184. Theory of Knowledge—The major competing theories of epistemological justification (foundationalism, coherentism, and externalism) are evaluated against the background of two central problems in the theory of knowledge: radical skepticism and the infinite regress argument. Readings: Descartes, Alston, Chisholm, Bonjour, Goldman, Pollock, Plantinga. Prerequisite: 80 or consent of instructor.
4 units, Spr (Lawlor)

185. Contextualism/Skepticism—Standard arguments for skepticism have proved compelling and hard to combat. Why do these arguments prove compelling while we consider them, but also prove to have no effect on our practice of attributing knowledge to ourselves and others? Contextualism seeks to exploit this curious fact in response to skepticism by claiming that how good a position one must be in to count as knowing varies with the context one is in. The skeptic changes the context, thereby briefly depriving one of one’s claim to know. Readings: Austin, Clarke, Cohen, DeRose, Dretske, Lewis, Unger.
4 units, not given 2000-01

186. Philosophy of Mind—The mind-body problem, including behaviorism, functionalism, and other forms of materialism; intentionality and the nature of mental representation; the explanation of action in terms of the agent’s reasons. Prerequisite: 80 or consent of instructor.
4 units, Win (Maguire)

187/287. Philosophy of Action—What is it to be an agent? Is there a philosophically defensible contrast between being an agent and being a locus of causal forces to which one is subject? What is it to act purposively? What is it to act intentionally? What is it to act for a reason? What is it to act autonomously? Readings: Davidson, Frankfurt, Korsgaard, Chisholm, Velleman, and others.
4 units, not given 2000-01

188. Personal Identity—People seem to remain the same despite the various changes they undergo during their lives. Why? The answer can profoundly influence one’s beliefs about whether people are essentially bodies or minds, and whether one’s own survival matters. Readings: John Locke, Thomas Reid, David Hume, Terence Penelhum, Bernard Williams, and Derek Parfit.
4 units, not given 2000-01

189. Philosophical Applications of Cognitive Science—The relevance of recent discoveries about the mind to philosophical questions in metaphysics, epistemology and philosophy of science, and ethics. Is there a right way to “carve up” the world into kinds of things? Are the rules of logic objective or just a description of the way we happen to...
5 units, Spr (Jaworska)

193W. Dostoevsky and Nietzsche—(Same as Interdisciplinary Studies in Humanities 193W.) Existentialist themes in selected writings of Nietzsche and in Dostoevsky's novel The Brothers Karamazov. Nihilism, the death of God, the eternal recurrence, the will to life, reason and unreason, freedom, guilt, and metaphysical rebellion.
5 units, Aut (Wood)

194. Undergraduate Seminars in Philosophy—Preference given to undergraduate majors. A series for advanced undergraduates. Enrollment limited to 14. For those in the Philosophy honors program, seminars serve as preparation for writing an honors thesis.

194A. Democratic Theory—The populist claim that democracy is a way to determine and express the will of the people, and that this is an essential element in the justification of democracy as a political ideal. Rousseau's account of the General Will, examining radical participatory democratic ideas and criticisms from social choice theory. The recent resurgence of populism in much of the literature on deliberative democracy. Authors: Rousseau, William Riker, and Joshua Cohen.
4 units, Aut (May)

194B. Philosophy of Mind and Animal Cognition—The conceptual and methodological problems raised by scientific efforts to understand non-human minds. Topics: understanding the idea that organisms can represent (rather than just react to) their environments; whether non-humans have beliefs and desires; potential limits to our knowledge about animal minds; and animals' knowledge of animal minds (how do we find out whether non-humans can think about each others' minds)? Readings in contemporary philosophy, comparative psychology, and developmental psychology.
4 units, Aut (Barrett)

194C. Self-Deception—It is possible to be self-deceived, but it also seems paradoxical. Understanding self-deception on the model of interpersonal lying leads to a difficulty: (If I deceive myself, who is the deceiver and who is the deceived?). Recent attempts to free self-deception from paradox, and the relation of self-deception to akrasia (weakness of will). Readings: Davidson, Pears, Elster, Fingarette.
4 units, Win (Lawlor)

194D. Duties to Future People—Why is it wrong to dump nuclear waste carelessly, or to plant time bombs on 200-year fuses? The only people who will be adversely affected by these actions don't yet exist. How can non-existent future people be sources of present moral duties? In Reasons and Persons, Derek Parfit argues that trying to answer these questions forces us to rethink deeply held moral assumptions. Seminar develops and defends responses to the difficulties that must be faced by attempts to account for duties to future people.
4 units, Win (Philpot)

194E. Evil—Detailed analysis of evil, its nature, requirements, and limits. Philosophical accounts in both religious and non-religious contexts. Topics: competing theories of evil, whether evil requires the existence of human freedom, God, or a certain kind of bad luck. Readings from historical to contemporary, including Kant, Nietzsche, Williams, Watson, Nagel, etc.
4 units, Spr (Vargas)

194F. Desires, Motivation, and Reasons for Action—The nature of human motivation and the nature of reasons for action. The concepts of motivation, desires, rational deliberation, internal and external reasons for action, and the normativity of reason. The possibility of rationally changing our desires and the relevance of this possibility to some traditional "study cases" of the philosophy of action: the toxin puzzle, weakness of the will, and the prisoner's dilemma.
4 units, Spr (Shemmer)

196. Tutorial: Senior Year
5 units, any quarter (Staff)

197. Individual Work for Undergraduates
any quarter (Staff)

198. The Dualist—Dedicated to the publication and promotion of The Dualist, a national journal of undergraduate work in philosophy. Requires neither papers nor presentations; students take the initiative in an informal atmosphere. May be taken one to three quarters. (AU) 1 unit, any quarter (Staff)

PRIMARILY FOR GRADUATE STUDENTS

Graduate students should also consult previous entries in the catalog for courses with graduate student numbers.

211. Problems in Medieval Philosophy—Exploration of issues in medieval philosophy, e.g., individuation and identity, the existence of God, realism vs. fictionalism, epistemological relativism as a response to problems of sense-deception, etc. Topic: Free Will in the works of Thomas Aquinas, John Duns Scotus, and William of Ockham.
3 units, Win (R. Wood)

222. Genealogical Method and the Genetic Fallacy—Philosophers make appeals to the history of philosophy in support of philosophical arguments. Such appeals may be problematic, especially when they purport to address distinctively normative philosophical problems about knowledge, morality, etc. That a certain idea or practice has a particular historical origin seems irrelevant to the question of its justification. Do all "genealogical" claims in philosophy commit this genetic fallacy, and do historical claims have a standing within philosophy? Readings from continental and analytic philosophy.
3 units (Anderson) not given 2000-01

223. Fichte's Theory of Personality—Introduction to the philosophy of mind, ethical theory, and political philosophy of the founder of German idealism. Chief texts: Lectures on the Scholar's Vocation (1794) and Foundations of Natural Right (1796).
3 units, Spr (A. Wood)

226. Kant's System of Reason—The role of the faculty of reason in Kant's theoretical philosophy. The limits Kant places on the use of this faculty, and the positive "regulative" use of the Ideas of Reason in philosophy and other sciences. Emphasis is on the ideal of systematicity in Kant's thought. Readings from the Critique of Pure Reason, the Critique of Judgment, other works of Kant. and secondary literature.
3 units (Anderson) not given 2000-01

235. James and Husserl—William James's Principles of Psychology and Husserl's main phenomenological works. Their bearing on recent psychological and philosophical studies of the mental.
3 units (Føllesdal, Suppes) not given 2000-01

237. Nietzsche—Nietzsche's later works, questions of the structure of these books, and what that structure can teach us about what kind of philosopher Nietzsche was. Interpretation of the central doctrines of Nietzsche's thought (perspectivism, the will to power, eternal recurrence) and Nietzsche's vision of the good life for human beings. Some secondary literature.
3 units (Anderson) not given 2000-01

239. Teaching Methods in Philosophy—For Ph.D. students in their second or third year who are teaching assistants for the department.
Discussion of issues about the teaching of philosophy.

240. Individual Work for Graduates
   any quarter (Staff)

242. Philosophy of Science Seminar
   3 units, not given 2000-01

250. Advanced Seminar in Philosophy of Education—(Same as Education 420B.)
   1-3 units (Phillips) not given 2000-01

260. Core Seminar in Philosophy of Science—For first- and second-year students in the Philosophy Ph.D. program.
   4 units, Spr (Godfrey-Smith, Strevens)

270. Core Seminar in Moral Philosophy—For first- and second-year students in the Philosophy Ph.D. program.
   4 units (Jaworska, Satz) not given 2000-01

271. Graduate Seminar: Topics in Democratic Theory—Modern approaches to democratic theory including liberal, communitarian, republican, and participatory theories beginning with the works of Locke, Rousseau, and Mill. Writers: John Rawls, Ronald Dworkin, Jeremy Waldron, Joshua Cohen, Habermas, Petit, Iris Marion Young, Ian Shapiro, and Amy Gutman.
   3-5 units (Ferejohn, Satz) not given 2000-01

273. Graduate Seminar: Kantian Constructivism—Critical examination of the views of contemporary Kantians who claim that Kant's moral theory represents a distinctive 'constructivist' approach to meta-ethics. Evaluation of these claims by looking closely at the elements of constructivism: its conceptions of obligation, value, action, the self, motivation, practical reason, and the domain of the moral. Emphasis is on the works of John Rawls, Christine Korsgaard, and their main critics.
   3 units, Win (Schapiro)

274. Graduate Seminar: Hume
   3 units, Win (Suppes, Collier)

275. Marx and Weber—Marx and Weber aspired to grasp the fundamental political problems of the human predicament (unfreedom, inequality, oppression, and bureaucratization). Both developed theories to account for these problems and investigated the extent that such problems could be mitigated or resolved, and believed that social science could contribute to our understanding of the modern world, and to our efforts to change it. Their works are evaluated with regard to our own convictions about politics, human agency, social change, and the role of knowledge.
   3 units, Win (Satz)

278. Margins of Agency—What can we learn about foundational issues and concepts in moral theory and moral psychology (autonomy, valuing, reasons for action, moral responsibility, etc.) by studying cases of "agency at the margins"; addiction, Alzheimer's disease, lesions in the prefrontal cortex, autism? Readings from contemporary literature.
   3 units, Aut (Jaworska)

279. Moral Psychology—Recent philosophical works on desire, intention, the motivation of action, valuing, and reasons for action. Readings: Williams, Korsgaard, Smith, Blackburn, Velleman, Stampe, Frankfurt, etc.
   3 units (Bratman) not given 2000-01

280. Core Seminar in Metaphysics and Epistemology—For first- and second-year students in the Philosophy Ph.D. program.
   4 units (Godfrey-Smith, Lawlor) not given 2000-01

281. Core Seminar in Philosophy of Language—For first- and second-year students in the Philosophy Ph.D. program.
   4 units, Aut (Crimmins, Perry)

282. Topics in the Philosophy of Mind: Remembering and Forgetting—The structure, content, functional role, and epistemic authority of human memories, drawing on philosophical and psychological literature from different schools and historical periods.
   3 units, Spr (Hills)

   3 units, Win (Perry)

285. Beyond Anthropocentrism?—It is a modern conviction, or prejudice, that all human thinking is bound to our (physical, societal, and cultural) condition. The various forms of this conviction and their justifications. Critical perspectives: premodern counterconceptions, current innovations (artificial intelligence, genetic technology), counterarguments in contemporary philosophy. Authors: Plato, Aristotle, Leibniz, Kant, Nietzsche, Husserl, Heidegger, Putnam, Nagel.
   3 units, Spr (Welsch)

286B. Graduate Seminar in Metaphysics—Examination of views on negation and predication (authors include Russell and Ramsey).
   3 units (Moraevsick) not given 2000-01

288. Graduate Seminar on Vagueness—Theories about the nature and extent of vagueness in language and in the world, plus an attempt to push the boundaries. Recommended: some background in logic, philosophy of language, and metaphysics.
   3 units (Crimmins) not given 2000-01

289. Perception, Representation, and Evidence—The interplay between the three notions in view of recent findings in neuropsychology and psychology. Readings from the current literature.
   3 units, Aut (Føllesdal, Suppes)

297. Phenomenology and Logic—Phenomenological views on logic, mathematics, and computation. Emphasis is on the contemporary relevance of these views. Selections from Husserl's work on logic and mathematics and from the recent literature.
   3 units, not given 2000-01

298. Logical Dynamics—Logical analysis of information flow and cognitive action, using recent techniques from dynamic logic and other process theories, update semantics for natural language, and (a powerful new development) interfaces with game theory.
   3 units, Spr (van Benthem)

299. Topics in Philosophy of Logic—Foundational issues in logic; the question of what the subject matter and boundaries of logic are. The claim that second-order logic is not logic. What has led philosophers to such a peculiar-sounding claim? Is the claim based, as the instructor has argued, on a faulty definition of logic consequence? Prerequisite: 160A, concurrent registration in 160A, or consent of the instructor.
   3 units (Etchemendy) not given 2000-01

314. Medieval Latin Paleography—The history of writing and an introduction to editing texts in philosophy, cosmology, mathematics, physics, psychology, theology, etc. A brief survey of medieval Latin scripts provides some basis for dating and placing European manuscripts. Introduction to medieval abbreviation, punctuation, and codicology. The use of reference works, e.g., incipit collections and manuscript catalogs. Students select, transcribe, edit, and present in class a medieval
Professor Byer is director of HEPL, and Professors Cabrera, Lipa, Michelson, Scherrer, Schettman, Smith, and Turneaure are members of the laboratory. The Ginzton Laboratory, HEPL, SLAC, and SSRL are listed in the "Independent Research Laboratories, Centers, and Institutes" section of this bulletin.

Stanford is a member of the Hobby-Eberly Telescope Consortium. This 10.4 meter telescope has begun operation at McDonald Observatory in Texas. There are opportunities for graduate and undergraduate students doing research projects to use this telescope.

Stanford has also built (with CalTech) an underground laboratory for the study of neutrino oscillations near the Palo Verde Nuclear Electric Power Generating Station, 50 miles west of Phoenix, Arizona. It is in operation and students are engaged in the construction and operation of the experiment.

The Physics Library, a center for the reading and study of physics and astronomy at all levels, includes current subscriptions and back sets of important journals together with textbooks, scholarly treatises in English, French, German, and Russian, and the collected works of the most eminent physicists.

Course work is designed to provide students with a sound foundation in both classical and modern physics. Students who wish to specialize in astronomy, astrophysics, or space science should consult the "Astronomy Course Program" section of this bulletin.

Three introductory series of courses include labs in which undergraduates carry out individual experiments. The Intermediate and Advanced Physics Laboratories offer facilities for increasingly complex individual work. Undergraduates are also encouraged to participate in research; most can do this through the honors program.

Graduate students find opportunities for research in the fields of astrophysics, atomic physics/laser science, coherent optical radiation, condensed matter physics, high energy physics, intermediate energy physics, low temperature physics, and theoretical physics. Opportunities for research are also available with the faculty at SLAC in the areas of theoretical and experimental particle physics and accelerator design, and with the faculty in Physics and Applied Physics in the areas of astrophysics, materials research, novel imaging technology, photon science, quantum electronics, and theoretical and experimental condensed matter physics.

The number of graduate students admitted to the Department of Physics is strictly limited. Students should submit applications by January 1 for the following Autumn Quarter. Graduate students may normally enter the department only at the beginning of Autumn Quarter.

UNDERGRADUATE PROGRAMS

The study of physics is undertaken by three principal classes of undergraduates: those including physics as part of a general education; those preparing for careers in professional fields that require a knowledge of physics, such as medicine or engineering; and those preparing for teaching or research careers in physics or related fields. Physics courses numbered below 200 are planned to serve all three of these groups. The courses numbered above 200 meet the needs mainly of the third group, but also of some students majoring in other branches of science and in engineering.

BACHELOR OF SCIENCE

Requirements for the degree of Bachelor of Science in Physics are: Physics 61, 63, 64, 65, 66, 70, 105, 106, 107, 110, 111, 120, 121, 122, 130, 131, 132, 170, 171, 201; Mathematics 51, 52, 53, 131; any one additional math course numbered 100 or higher; and one of the following advanced physics courses: 135, 160, 161, 172, 181, 203, 204 or 262. (The Physics 40 series can replace the 60 series requirements, and Mathematics 51H, 52H, and 53H may substitute for Mathematics 51, 52, and 53.) The department advises the study of some chemistry, for example, Chemistry 31 or 32, 33, and 35 and some computer science, for example, CS 106. Mathematics and physics courses taken to satisfy the department's major requirements cannot be taken on a credit/no credit basis. Prospective physics majors are also recommended to take Physics 59, Current Research Topics.

In an effort to increase the flexibility of the Physics major for students with strong interests in allied disciplines such as biology, chemistry, computer science, electrical engineering, earth sciences, or mathematics, elected courses from the Physics major (indicated by an * below) may be replaced with a concentration of correspondingly advanced courses in one of these other fields. In all cases, these modifications to the Physics major towards an interdisciplinary course of study should be worked out beforehand with the student's adviser and must be documented with the undergraduate program coordinator.

To decide which introductory sequence is appropriate, students contemplating majoring in physics are urged to consult with the instructor of Physics 61 or Physics 41, or the undergraduate program coordinator, at the earliest possible date to see which sequence is the most suitable. Students who begin taking an entry level physics course after their freshman year and wish to major in physics are generally advised to take the Physics 61, 63, 65 sequence, provided they have previously taken Mathematics 41.

Undergraduates are offered help with physics problems in the department tutoring center, the Reference Frame, which is staffed Monday through Thursday.

REQUIRED COURSES FOR MAJORS

INTRODUCTORY SEQUENCE

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 41, Mechanics</td>
<td>A 3</td>
</tr>
<tr>
<td>Physics 43, Electricity</td>
<td>W 3</td>
</tr>
<tr>
<td>Physics 45, Magnetism</td>
<td>S 3</td>
</tr>
<tr>
<td>Physics 46, Electricity</td>
<td>A 4</td>
</tr>
<tr>
<td>Physics 47, Light and Heat</td>
<td>A 1</td>
</tr>
<tr>
<td>Physics 48, Light and Heat Lab</td>
<td>S 1</td>
</tr>
<tr>
<td>Physics 61, Mechanics</td>
<td>A 4</td>
</tr>
<tr>
<td>Physics 63, Electricity and Magnetism</td>
<td>W 4</td>
</tr>
<tr>
<td>Physics 64, Electricity and Magnetism Lab</td>
<td>S 3</td>
</tr>
<tr>
<td>Physics 65, Optics and Thermodynamics</td>
<td>S 1</td>
</tr>
<tr>
<td>Physics 66, Optics and Thermodynamics Lab</td>
<td>A 4</td>
</tr>
<tr>
<td>Math. 51,52, 53. Multivariable Mathematics (or H series)</td>
<td>A,W,S 15</td>
</tr>
<tr>
<td>Physics 59. Current Research Topics (recommended)</td>
<td>W 1</td>
</tr>
</tbody>
</table>

INTERMEDIATE SEQUENCE

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 70. Modern Physics</td>
<td>A 3</td>
</tr>
<tr>
<td>Physics 105,106,107. Intermediate Laboratory</td>
<td>W,S 8</td>
</tr>
<tr>
<td>Physics 110,111. Intermediate Mechanics</td>
<td>W,S 8</td>
</tr>
<tr>
<td>Physics 120,121,122*. Intermediate Electricity and Magnetism</td>
<td>A,W,S 12</td>
</tr>
<tr>
<td>Math. 131. Partial Differential Equations</td>
<td>W,S 3</td>
</tr>
</tbody>
</table>

ADVANCED SEQUENCE

<table>
<thead>
<tr>
<th>Course No. and Subject</th>
<th>Qtr. and Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 130,131,132*. Quantum Mechanics</td>
<td>A,W,S 12</td>
</tr>
<tr>
<td>Physics 170,171. Statistical Mechanics</td>
<td>A,W 8</td>
</tr>
<tr>
<td>Physics 201*. Advanced Physics Laboratory</td>
<td>A,S 3</td>
</tr>
<tr>
<td>one advanced Physics elective*</td>
<td>A,S 3</td>
</tr>
<tr>
<td>Physics 135. Computational Physics</td>
<td>A 3</td>
</tr>
<tr>
<td>Physics 160,161. Astrophysics</td>
<td>A,S 6</td>
</tr>
<tr>
<td>Physics 172. Solid State Physics</td>
<td>A 3</td>
</tr>
<tr>
<td>Physics 181. Modern Optics</td>
<td>S 3</td>
</tr>
<tr>
<td>Physics 203. Advanced Physics Laboratory</td>
<td>A,S 3</td>
</tr>
<tr>
<td>Physics 204. Theoretical Physics</td>
<td>A,S 3</td>
</tr>
<tr>
<td>Physics 262. Gravitation and Astrophysics</td>
<td>S 3</td>
</tr>
</tbody>
</table>

* These courses may be replaced with a concentration of correspondingly advanced courses in another field as part of an interdisciplinary program. This must be discussed with the student's adviser and documented with the undergraduate program coordinator.

CONCENTRATION IN ASTROPHYSICS

This area encompasses the study of the universe and its constituent planets, stars, and galaxies. The courses recommended for a concentration in astrophysics are four undergraduate courses; one laboratory course, 100; and three lecture courses: Electrical Engineering 106 (see also the Astronomy Program) on planetary exploration; Physics 160 on stars and galactic structure; and Physics 161 on galaxies and cosmology. More advanced students, and in particular, those undergraduates whose honors thesis topic is in this concentration area, are strongly urged...
to take the two introductory graduate courses on Astrophysics and Gravitation, 260 and 262.

MINORS

CONCENTRATIONS IN PHYSICS

The minor declaration deadline is three quarters before graduation (that is, beginning Autumn Quarter if the student is graduating at the end of Spring Quarter). All courses for the minor must be taken at Stanford University, and a letter grade of 'C' or better must be received for all units applied toward the minor, (with the exception of Physics 105, 106, and 107 which may be taken for CR/NC).

An undergraduate minor in Physics requires the following course work:

Non-Technical—For students whose majors do not require the Physics 40 or 60 series:

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 41, 43, 45, 47 (choose three out of four)</td>
<td>9-10</td>
</tr>
<tr>
<td>Physics 25 or 70 (70 is technically much more demanding)</td>
<td>3</td>
</tr>
</tbody>
</table>

Choose two lab courses from the following:

| Physics 46, 48, 72 | 2 |

Choose two courses from the following:

| Physics 100, 105, 106, 107, 110, 111*, 120*, 121*, 130*, 131*, 160, 161, 170*, 171* | 6-8 |

Total: 20-23

Technical—For students whose majors require the Physics 40 or 60 series:

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 70, 72</td>
<td>4</td>
</tr>
<tr>
<td>Physics 110, 120*, 130*, 170*</td>
<td>16</td>
</tr>
</tbody>
</table>

Choose two courses from the following:


Total: 24-28

* Requires differential equations.

CONCENTRATIONS IN ASTRONOMY

Modern astronomy deals with the origin and evolution of the dramatic range of objects observed in our Universe. The language of this study is physics. Those wishing to pursue advanced work in astrophysics or related fields should major in physics with an astrophysics concentration.

The minor programs below are designed primarily for those from other disciplines with a general interest in astronomy. In particular, the non-technical minor treats the subject in a more descriptive manner.

To be accepted to the minor program, students need to obtain an adviser selected from the faculty in the Astronomy Course Program. The minor declaration deadline is three quarters before graduation (that is, beginning Autumn Quarter if the student is graduating at the end of Spring Quarter). All courses for the minor must be taken at Stanford University, and a letter grade of 'C' or better must be received for all units applied toward the minor.

An undergraduate minor in Astronomy requires the following course work:

Non-Technical—For students whose majors do not require the Physics 40 series:

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 21, 23, 25</td>
<td>9</td>
</tr>
<tr>
<td>Physics 50 or 100</td>
<td>3-4</td>
</tr>
</tbody>
</table>

Choose two courses from the following:

| Physics 15, 16, 18N, 27, 162* | 6-7 |

Technical—For students whose majors require the Physics 40 series:

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics 27*</td>
<td>3</td>
</tr>
<tr>
<td>Physics 70</td>
<td>3</td>
</tr>
<tr>
<td>Physics 100</td>
<td>4</td>
</tr>
<tr>
<td>Physics 160*, 161*, 162*</td>
<td>9</td>
</tr>
</tbody>
</table>

Total: 18-20

* With approval of the minor adviser and the chair of the Astronomy program, 3 units of Physics 169 (Independent Study in Astrophysics) may be substituted for one of these courses. This independent study can either be constituted as a directed reading program or participation in a research project.

HONORS PROGRAM

The department offers a program leading to the degree of Bachelor of Science in Physics with Honors as follows:

1. Students must submit an Honors Program Proposal to the Undergraduate Program Coordinator once they find a physics project, either theoretical or experimental, in consultation with individual faculty members. Proposal forms are available from the Physics Undergraduate Center and must be submitted by November 1 of the year in which the students' degree will be conferred.

2. Credit for the project is assigned by the adviser within the framework of Physics 205 or Astronomy 169. The work done in the honors program may not be used as a substitute for regularly required courses.

3. Both a written report and a presentation of the work at its completion is required for honors. By mid-May, each honors candidate is required to present his or her project at the department's Honors Presentations. (This event is publicized and is open to the general public. The expectation is that the student's adviser and second reader, along with all other honors candidates, will attend.)

4. The decision as to whether a given independent study project does or does not merit award of honors is made jointly by the student's honors adviser and the second reader for the written thesis. This decision is based on the quality of both the honors work and the other work in physics.

GRADUATE PROGRAMS

MASTER OF SCIENCE

The department does not offer a coterminal degree program, nor a separate program for the M.S. degree, but this degree may be awarded for a portion of the Ph.D. degree work.

University requirements for the master's degree, discussed in the "Graduate Degrees" section of this bulletin, include registration for at least three quarters at full tuition as a graduate student and completion of 36 units of course work after the bachelor's degree. Among the department requirements are a grade point average (GPA) of at least 'B' in courses 201, 203, 210, 211, 212, 220, 221, 230, 231, 232, or their equivalents. Up to 6 of these required units may be waived on petition if a thesis is submitted.

DOCTOR OF PHILOSOPHY

The University's basic requirements for the Ph.D. are discussed in the "Graduate Degrees" section of this bulletin. The minimum department requirements for the Ph.D. degree in Physics consist of completing all courses listed below, and at least one quarter from each of two subject areas (among condensed matter, quantum optics and atomic physics, astrophysics and gravitation, and nuclear and particle physics) chosen from courses with numbers above 232, except 290 and 294. The requirements in this list may be fulfilled by passing the course at Stanford or passing an equivalent course elsewhere: 201, 203, 210, 211, 212, 220, 221, 230, 231, 232, 290, 294. A grade point average (GPA) of at least 'B' is required in all the courses taken toward the degree.

All Ph.D. candidates must have math proficiency equivalent to the following Stanford math courses: 106, 113, 114, 130, 131, 132.

Prior to making an application for candidacy, each student is required to pass a comprehensive qualifying examination on undergraduate physics. This exam is given annually at the beginning of Winter Quarter. Graduate physics is tested by the exams in the first-year courses (210-232). A thesis proposal must be submitted during the third year. In order to assess the direction and progress toward a thesis, an oral report and evaluation is required during the fourth year. After completion of the dissertation, each student must take the University oral examination (defense of dissertation). The Physics faculty also believe that a scientist should have facility with a foreign language for cultural reasons as well as to establish better contact at meetings in foreign countries.

Three-quarters of teaching (including a demonstrated ability to teach) are a requirement for obtaining the Ph.D. in Physics.

Students interested in applied physics and biophysics research should also take note of the Ph.D. granted independently by the Department of
Applied Physics and by the Biophysics Program administered through the Department of Chemistry. Students interested in astronomy, astrophysics, or space science should also consult the "Astronomy Course Program" section of this bulletin.

Ph.D. MINOR

Minors in Physics must take at least six courses numbered 210 to 232 among the 20 required units. All prospective minors must obtain approval of their physics course program from the Physics Graduate Study Committee at least one year before award of the Ph.D.

FELLOWSHIPS AND ASSISTANTSHIPS

The Department of Physics makes an effort to support all its graduate students through fellowships, teaching assistantships, research assistantships, or a combination of sources. Information on application procedures is mailed with the admission information.

TEACHING CREDENTIALS

For information on teaching credentials, consult the "School of Education" section of this bulletin or address an inquiry to the Credential Administrator, School of Education.

The degree of Master of Arts in Teaching is offered jointly by this department and the School of Education. The degree is intended for those who have a teaching credential and wish to strengthen their academic preparation. The program consists of a minimum of 25 units in the teaching field and 12 units in the School of Education. A suggested minimum would be Physics 64, 66, 70, 105, 110, 111, 120, 121; and Mathematics 130, 131. Detailed requirements for the degree are outlined in the "School of Education" section of this bulletin.

COURSES

There are four series of beginning courses. One course from the teen series (11, 15, 16, 19, 27) is recommended for the humanities or social science student who wishes to become familiar with the methodology and content of modern physics. The Twenty Series (21, 22, 23, 24, 25, 26) is recommended for general students and for students preparing for medicine or biology. The Forty Series (41, 43, 45, 46, 47, 48) is for students of engineering chemistry, geology, mathematics, or physics. The Advanced Freshman Series (61, 63, 64, 65, 66) is for the well-prepared student and is the preferred introductory series for those physics majors who have the appropriate background.

Both the Twenty and Forty Series consist of demonstration lectures on the fundamental principles of physics, problem work on application of these principles to actual cases, and lab experiments correlated to the lectures. Their objectives are not only to give information on particular subjects, but also to provide training in the use of the scientific method.

The primary difference between the two series of courses is that topics are discussed more thoroughly and treated with greater mathematical rigor in the Forty Series.

Courses beyond 99 are numbered in accordance with a three-digit code. The first digit indicates the approximate level of the course: undergraduate courses (1); first-year graduate courses (2); more advanced courses (3); research, special, or current topics (4). The second digit indicates the general subject matter: laboratory (0); general courses (1), (2), (3); nuclear physics (4); elementary particle physics (5); astrophysics, cosmology, gravitation (6); condensed matter physics (7); optics and atomic physics (8); miscellaneous courses (9).

UNDERGRADUATE

(WIM) indicates that the course meets the Writing in the Major requirement.

ASTRONOMY

For further information on astronomy and astrophysics courses, consult the Astronomy Course Program.

15,16. Topics in Modern Astronomy—15 and 16 are for students not majoring in the physical sciences and are taught in different quarters by different instructors. They are related in topic but emphasize different aspects of modern astronomy and cosmology. Students may take 15, 16 individually or in sequence.

15. The Nature of the Universe—Introduction to the structure, origin, and evolution of the major components of the Universe: planets, stars, and galaxies. Emphasis is on the formation of the Sun and planets, the evolution of stars, and the structure and content of our galaxy. Topics: cosmic enigmas (dark matter, black holes, pulsars, X-ray sources), star birth and death, and the origins of and search for life in our solar system and beyond. GER:2a (DR:5)

3 units, Aut (Cabrera)

16. Cosmic Horizons—Introduction to the origin and evolution of our universe and its contents: stars, galaxies, quasars, etc. The overall structure of the cosmos and the physical laws that govern matter, space, and time. Topics: the evolution of the cosmos from its primordial fireball, the origin of the elements and the formation of stars and galaxies, exotic astronomical objects (black holes, quasars, supernovae, and gamma ray bursts), dark matter, and the fate of the cosmos.

3 units, Win (Linde)

18N. Stanford Introductory Seminar: Revolutions in Concepts of the Cosmos—Preference to freshmen. Faculty led dialogue. Introduction to four revolutionary changes in humanity's concept of the cosmos (explored at the Stanford Observatory): Copernicus' heliocentric model of the solar system, Herschel's concept of the galaxy as a collection of stars, Shapley's model of the Milky Way galaxy, and Hubble's discovery that the universe is expanding. Enrollment limited to 20 in one section. GER:2a (DR:5)

4 units, Spr (Staff)

27. Evolution of the Cosmos—Similar to 15 or 16 but at a somewhat more quantitative level. The origin and evolution of astronomical objects: planets, stars, black holes, galaxies, and the universe at large; emphasizing modern developments in astronomy and physics relevant to the subject matter. The development of life in the universe. (Algebra is used.) Offered occasionally. Recommended: high school physics and calculus. GER:2a (DR:5)

3 units, not given 2000-01

50. Astronomy Laboratory and Observational Astronomy—The theory and use of the optical telescope and the interpretation of basic observational data of planets, stars, and galactic systems. Individual observations with a 24-inch Cassegrain telescope are supplemented by lectures/discussion of basic observational techniques, astronomical catalogs and coordinate systems, and the relation of observations to astrophysical models. Limited enrollment. Lab. GER:2a (DR:5)

3-4 units, Aut, Sum (Staff)


1 unit, Aut (Dimopoulos)

81Q. Stanford Introductory Dialogue: Lookback Time in Cosmology—Preference to sophomores. The use of telescopes as "time machines" to see the history of the universe. Summary of the big bang, and galaxies and quasars at high redshift. How old is the universe? When did the first objects form? When were the elements created? What is the cosmic dark matter? Can we predict the future evolution of the cosmos? Discussion is at a semi-quantitative level: basic physics concepts are used without calculus. Directed reading, sample exercises, and (weather permitting) a term project observing distant galaxies and quasars at the Stanford teaching observatory. Prerequisites: elementary physics (21-25 or equivalent).

1 unit, Aut (Romani)
82Q. Stanford Introductory Dialogue: Expanding Cosmic Horizons—Preference to sophomores. The history and structure of our cosmic environment. How recent advances in observations at various wavelengths are expanding the horizons of our knowledge. Possible topics: What are the properties of black holes? What is the nature, amount, and distribution of the "dark matter" which appears to dominate the universe? What is the geometry and fate of the universe? Prerequisite: freshman physics or equivalent.

1 unit, Spr (Wagoner)

100. Introduction to Observational and Laboratory Astronomy—Introduction to observational techniques in astronomy for physical science or engineering students. Emphasis is on the measurement of fundamental astronomical parameters such as distance, temperature, mass, and composition of stars. Lecture and observation using the 24-inch telescope at the Stanford Student Observatory. Limited enrollment. Prerequisites: one year of physics; prior or concurrent registration in 25, 65, or 70; and consent of instructor. GER:2a (DR:5)

4 units, Spr (Staff)

160. Introduction to Stellar and Galactic Astrophysics—Physics of the sun. Evolution and death of stars. White dwarfs, novae, planetary nebulae, supernovae, neutron stars, pulsars, binary stars, x-ray stars, and black holes. Galactic structure: interstellar medium, molecular clouds, HI and HII regions, star formation and element abundances. Prerequisites: calculus and one year of college physics at the level of the Physics 40 series or equivalent.

3 units, Aut (Petrosian)

161. Introduction to Extragalactic Astrophysics and Cosmology—Observations of the distances and compositions of objects on cosmic scales: galaxies, galaxy superclusters, quasars, and diffuse matter at high redshift. Big bang cosmology, including cosmic expansion, the origin of matter and the elements, inflation, and creation of structure in the universe. Observational evidence for dark matter. Models for the fate of the universe. Emphasis is on physical processes in the early universe. Prerequisites: calculus and one year of college physics at the level of the Physics 40 series or equivalent.

3 units, Spr (Church)

162. Planetary Exploration—(Enroll in Electrical Engineering 106.)

3 units, Spr (Fraser-Smith)

169A,B,C. Independent Study in Astrophysics and Honors Thesis—Detailed study of a selected problem in astrophysics with one or more faculty members. While not all projects require three quarters, the sequence below suggests the format most projects are expected to follow. Projects may commence in any quarter.

169A. Selection of the Problem—Selection of the problem to be studied and development of the theoretical apparatus or initial interpretation of the selected problem. Preparation of a detailed description of the problem and its background and a comprehensive discussion of the work planned in the subsequent two quarters.

1-9 units, Aut (Staff)

169B. Continuation of Project—Substantial completion of the required computations or data analysis for the research project selected.

1-9 units, Win (Staff)

169C. Completion of Project—Completion of research and writing of a detailed paper presenting methods used and results.

1-9 units, Spr (Staff)

PHYSICS

11N. Stanford Introductory Seminar: Symmetries of Nature—From Inner Space to Outer Space—Preference to freshmen. Physicists use symmetry principles to discover the laws of nature on a subatomic scale and how these symmetries determine the behavior of matter on microscopic scales of atoms, nuclei, and elementary particles. In parallel with understanding subatomic scales (Inner Space), understanding the structure and development of the universe (Outer Space) has undergone radical revisions. Observations of the motions of galaxies have led to the conclusion that the universe began with an instantaneous, enormous explosion, about 12 billion years ago. The status of the quest to unify the fundamental interactions (electromagnetic, weak, strong, and gravitational) observed in Nature into a unified Theory of Everything. The impact of this quest to understand Inner Space on understanding the origin and evolution of the universe. Discussions are semiquantitative. Term project paper. Prerequisite: high school physics or equivalent.

2 units, Aut (Gratta)

12Q. Stanford Introductory Seminar: Science, Society, and Politics—Preference to sophomores. Scientific research has a profound impact on society, and society has come to expect solutions to important social issues. The public debates on the major science-related issues of the day: global warming and ozone depletion; the danger posed by earth-astroid collisions; the cancellation of the Super-conducting Supercollider; the U.S. decision to build the Space Station jointly with Russia; "clean" nuclear power from fusion; cosmology and the Hubble telescope; the debate on manned exploration of Mars; the search for extraterrestrial life; the debate on the appropriate level of funding for scientific research; and cooperation and competition between science and the humanities. Offered occasionally.

4 units, not given 2000-01

19. How Things Work: An Introduction to Physics—Non-technical survey of the methodology of physics and some of the achievements in understanding the physical world. Physics is explored by observing its impact on everyday life. Emphasis is hands-on experience through class demonstrations and other practical activities. Prerequisite: high school algebra and trigonometry.

3 units, Win (Fisher)

21. Mechanics and Heat—For biology, social science, and premedical students. Introduction to Newtonian mechanics, fluid mechanics, theory of heat. Calculus is used as a language and developed as needed. Prerequisites: working knowledge of elementary algebra and trigonometry. GER:2a (DR:5)

3 units, Aut (Wojcicki)


1 unit, Aut (Wojcicki)

23. Electricity and Optics—Electric charges and currents, magnetism, induced currents; wave motion, interference, diffraction, geometrical optics. Prerequisite: 21. GER:2a (DR:5)

3 units, Win (Church)

24. Electricity and Optics Laboratory—Pre- or corequisite: 23.

1 unit, Win (Church)

25. Modern Physics—Introduction to modern physics. Relativity, quantum mechanics, atomic theory, radioactivity, nuclear reactions, nuclear structure, high energy physics, elementary particles, astrophysics, stellar evolution, and the big bang. Prerequisite: 23 or consent of instructor. GER:2a (DR:5)

3 units, Spr (Susskind)

26. Modern Physics Laboratory—Pre- or corequisite: 25.

1 unit, Spr (Susskind)

28. Mechanics, Heat, Electricity, and Magnetism I—For biology, social science, and premedical students. The sequence 28 and 29 fulfills, in ten weeks, the one-year college physics requirement (with lab) of most medical schools. Topics: Newtonian mechanics, fluid mechanics, theory of heat, electric charges, and currents. Calculus is used as a language and developed as needed. Prerequisite: working knowledge of elementary algebra and trigonometry. GER:2a (DR:5)

6 units, Sum (Fisher)
29. Electricity and Magnetism II, Optics, Modern Physics—Magnetism, induced currents; wave motion, optics; relativity, quantum mechanics, atomic theory, radioactivity, nuclear structure and reactions, elementary particles, astrophysics, and cosmology. Prerequisite: 28. GER: 2a (DR: 5)
   6 units, Sum (Fisher)

41. Mechanics—Vectors, particle kinematics and dynamics, work, energy, momentum, angular momentum; conservation laws; rigid bodies. Discussions based on use of calculus. Corequisite: Mathematics 19 or 41, or consent of instructor. GER: 2a (DR: 5)
   3 units, Aut (Schwettman)

41N. Stanford Introductory Seminar: Mechanics—Insights, Applications, and Advances—Preference to freshmen. Faculty led and associated with 41, with student participation. Possible topics: tidal forces, gyroscopic effects, fractal dimensions, and introduction to chaos. Enrollment limited to 20 in one section. Corequisite: 41 or advanced placement.
   1 unit, Aut (Romani)

43. Electricity—Mechanical waves. Electrostatics including fields, potentials, capacitors, and dielectrics. Steady state currents, and circuits with batteries and resistors. RC circuits. Prerequisites: 41, and Mathematics 19 or 41. Corequisite: Mathematics 20 or 42, or consent of instructor. GER: 2a (DR: 5)
   3 units, Win (Cabrera)

43N. Stanford Introductory Seminar: Electricity—Understanding Electrical Phenomena—Preference to freshmen. Expands on the material presented in 43, discussing a variety of phenomena associated with electricity and magnetism, and allowing students to connect the material in 43 with the world in which they live. Corequisite: 43 or advanced placement.
   1 unit, Win (Osheroff)

45. Magnetism—Time varying currents and fields, inductance, Maxwell’s equations, electromagnetic oscillations and waves. Special relativity. Prerequisite: 43. GER: 2a (DR: 5)
   3 units, Spr (Michelson)

45N. Stanford Introductory Seminar: Special Topics in Electromagnetism—Preference to freshmen. Expands on the material presented in 45, discussing a variety of phenomena associated with electricity and magnetism, and allowing students to connect the material in 45 with the world in which they live. Special topics related to recent developments in experimental and theoretical physics. Corequisite: 45 or advanced placement.
   1 unit, Spr (Schwettman)

46. Electricity and Magnetism Laboratory—Pre- or corequisite: 45.
   1 unit, Spr (Michelson)

47. Light and Heat—Reflection and refraction of light, lens systems; light and electromagnetic waves; temperature, properties of matter, introduction to kinetic theory of matter. Prerequisites: 45 and Mathematics 51, or consent of instructor. GER: 2a (DR: 5)
   4 units, Aut (Osheroff)
   Sum (Pam)

48. Light and Heat Laboratory—Pre- or corequisite: 47.
   1 unit, Aut (Osheroff)
   Sum (Pam)

59N. Current Research Topics—Recommended for all prospective physics majors. Major areas of current research. Topics: fundamental particles, solid state physics, low temperature physics, biophysics, and astrophysics. Lectures by faculty and physicists with research interests in these fields.
   1 unit, Aut (Dimopoulos)

61, 63, 65. Advanced Freshman Physics—Recommended for students contemplating a major in Physics and other students interested in a more rigorous treatment of physics. The fundamental structure of classical physics including Newtonian mechanics, special relativity, and electricity and magnetism; selected topics in heat and light in Spring Quarter. Lectures and small discussion sections. Prerequisites: high school physics and familiarity with calculus (differentiation and integration in one variable); prior or concurrent registration in Mathematics 42. Physics 61, 63, and 65 are all GER: 2a (DR: 5)
   61. 4 units, Aut (Moler)
   63. 4 units, Win (Dimopoulos)
   65. 4 units, Spr (Kallosh)

   1 unit, Win (Thomas)

64, 66. Advanced Freshman Physics Laboratories—Experimental work in mechanics, electricity and magnetism, and optics. Prerequisite: 61.
   64. 1 unit, Win (Dimopoulos)
   66. 1 unit, Spr (Kallosh)

65N. Stanford Introductory Seminar: Statistical Mechanics—Principles and Applications—Preference to freshmen. Faculty led and associated with 65, including material related to 65, but at a slightly more advanced level. Student participation is encouraged in the selection of topics. Enrollment limited to 20 in one section. Corequisite: 65.
   1 unit, Spr (Roodman, Staff)

70. Modern Physics—Relativity, the experimental basis of quantum theory, Schrödinger equation, atomic structure, nuclear structure, high energy physics, elementary particles. Prerequisite: 45. Recommended: prior or concurrent registration in Mathematics 53 or 130. GER: 2a (DR: 5)
   3 units, Aut (Kapitulnik)

72. Modern Physics Laboratory—Pre- or corequisite: 25 or 70.
   1 unit, Aut (Kapitulnik)

80N. Stanford Introductory Seminar: The Technical Aspects of Photography—Preference to freshmen. For those with some background in photography. How cameras record photographic images on film and electronically. The technical photographic processes which the photographer must understand in order to use cameras effectively. Camera types and their advantages, how lenses work and their limitations, camera shutters, light meters and the proper exposure of film, film types, depth of focus, control of the focal plane and perspective, and special strategies for macro and night photography. View cameras and range finder technical cameras. Students exploit the flexibility of these formats to take photographs around campus. Prerequisite: knowledge of elementary physics.
   3 units, Spr (Osheroff)

83Q. Stanford Introductory Seminar: The Physics of Terrorist Bomb Detection—Preference to sophomores. The bombing of Pan Am 103 over Lockerbie, Scotland in December 1988 has pushed efforts to
develop a suitable bomb detector to protect airplanes, buildings, tunnels, and other terrorist targets. The limitations imposed on a successful detection system, and the physics principles already tried or under development. Site visits are made to industrial laboratories engaged in making bomb detectors. Prerequisite: high school background in physics.

3 units

84Q. Stanford Introductory Dialogue: On Growth and Form—Preference to sophomores. Introduces important concepts in physics by analyzing the shapes of objects and growth mechanisms from a statistical mechanics point of view. Concepts such as self similarity, fractals, and random processes describe the objects. Simple computer simulations study and visualize objects. Demonstrations by instructor and the students.

1 unit

105,106,107. Intermediate Physics Laboratory Seminars—Sequence in experimental techniques required of all Physics majors. Topics: electronics, detectors and radioactive sources, optics and lasers, statistics and data handling. Lectures/labs. 106 consists of independent experiments. Prerequisites: 46 or 64 and 66; prior or concurrent registration in 48 and the 120 series.

105. Laboratory Seminar I: Electronics 3 units, Aut (Fam)

106. Laboratory Seminar II: Particle Physics Experimental Techniques 3 units, Win (Moler)

107. Laboratory Seminar III: Optics—(WIM) 3 units, Spr (Fejer)

110,111, Intermediate Mechanics—The mechanics of systems of particles and rigid bodies. Coordinate transformation and vectors; Newtonian mechanics; linear and nonlinear oscillations; Hamilton’s principle, Lagrangian and Hamiltonian dynamics; central forces, planetary motion; collisions; non-inertial reference systems; rigid body dynamics; coupled oscillations; and introductory fluid mechanics. Prerequisites: 41 or 61, and Mathematics 53 or 130.

110. 4 units, Win (Shen)

111. 4 units, Spr (Vuletic)

120,121,122. Intermediate Electricity and Magnetism—Vector analysis, electrostatic fields, including multipole expansion; dielectrics. Special relativity and transformation between electric and magnetic fields. Maxwell’s equations. Static magnetic fields, magnetic materials. Electromagnetic radiation, plane wave problems (free space, conductors and dielectric materials, boundaries). Dipole and quadrupole radiation. Wave guides and cavities. Prerequisites: 45 or 63; concurrent or prior registration in Mathematics 53, 130 or 131 with Physics 120 and 121, respectively. Recommended: concurrent or prior registration in Mathematics 103.

120. 4 units, Aut (Peskin, Staff)

121. 4 units, Win (Peskin, Staff)

122. 4 units, Spr (Peskin, Staff)

130,131,132. Quantum Mechanics—The origins of quantum mechanics, wave mechanics, and the Schrödinger equation. Heisenberg’s matrix formulation of quantum mechanics, solutions to one-dimensional systems, separation of variables and the solution to three-dimensional systems, the central field problem and angular momentum eigen-states, spin and the coupling of angular momentum, Fermi and Bose statistics, perturbation theory and other approximation techniques. Scattering theory: partial wave expansion, Born approximation, Green’s functions. Reference to problems in atomic and nuclear physics explaining the basic phenomenology of these disciplines. Invariance principles and conservation laws in the context of quantum theory. Prerequisites: 70 or equivalent and 110,111; concurrent or prior registration in 120,121,122, and Mathematics 53 or 130, 131.

130. 4 units, Aut (Burchat)

131. 4 units, Win (Burchat)

132. 4 units, Spr (Fetter)

135. Computational Physics—The development of computational methods with application to problems in classical, electro-, quantum, and statistical mechanics. Numerical integration; solution of ordinary differential equations including the Runge-Kutta method; solutions of the heat equation and Poisson’s equation with relaxation methods, etc.; Monte Carlo methods; matrix methods and eigenvalue problems. Short introduction to Basic programming; class projects may be programmed in Basic, Fortran Pascal, or C. Offered occasionally. Prerequisites: 110, 111, 121; Mathematics 53 or 130.

3 units, Aut (Doniach)

150. Applied Quantum Mechanics I—(Graduate students register for 222; enroll in Applied Physics 150.) 4 units, Aut (Miller)

151. Applied Quantum Mechanics II—(Graduate students register for 223; enroll in Applied Physics 151.) 4 units, Spr (Miller)


3 units, Spr (Dixon)

170,171. Thermodynamics, Kinetic Theory, and Statistical Mechanics—The derivation of laws of thermodynamics from basic postulates; the determination of the relationship between atomic substructure and macroscopic behavior of matter. Temperature; equations of state, heat, internal energy; entropy; reversibility; applications to various properties of matter; absolute zero and low-temperature phenomena. Distribution functions, transport phenomena, fluctuations, equilibrium between phases, phase changes, the partition function for classical and quantum systems, Bose-Einstein condensation, and the electron gas. Cooperative phenomena including ferromagnetism, the Ising model, and lattice gas. Irreversible processes. Prerequisites: 47 or admission to Advanced Sequence, and Mathematics 53 or 130.

170. 4 units, Aut (Silverstein, Staff)

171. 4 units, Win (Laughlin)


3 units, Spr (Greven)

181. Introduction to Modern Optics—(Enroll in Applied Physics 268.) 3 units, Aut (Byer)

190. Independent Study—Undergraduate research in experimental or theoretical physics under the supervision of a faculty member. Prerequisites: superior work as an undergraduate physics major; approval of the instructor and of the Undergraduate Study Committee of the department.

1-15 units, any quarter (Staff)

192. Introductory Biophysics—(Enroll in Applied Physics 192.) 3 units, alternate years, given 2001-02

201,203. Advanced Physics Laboratory—Experiments in atomic, nuclear, solid state, and low-temperature physics; optics; and particle...
204. Senior Seminar in Theoretical Physics—Topics of recent interest in theoretical physics: Bose-Einstein condensation of atoms, high Tc superconductivity of cuprates, quantized Hall effect, quantum chaos, superfluidity of 3He. Work in the seminar may provide a basis for an honors project in theoretical physics. Prerequisite: 132 or consent of instructor.

3 units, Aut (Laughlin)

205. Honors Undergraduate Research—Experimental or theoretical project and thesis in physics under supervision of a faculty member. Planning of the thesis project should begin no later than middle of the junior year. Successful completion of an honors thesis leads to graduation "with departmental honors." Prerequisites: superior work in physics as an undergraduate major and approval of the honors committee.

1-12 units, any quarter (Staff)

207. Laboratory Electronics—(Enroll in Applied Physics 207, 208.)

207. 3 units, Win (Fox)
208. 3 units, Spr (Fox) alternate years, not given 2001-02

208. Advanced Particle Mechanics—The Lagrangian and Hamiltonian dynamics of particles (a review), small oscillations, and rigid body motion. Transition to continuum mechanics. Prerequisites: 111, 122.

3 units, Aut (Fetter)


3 units, Win (Wagoner)


3 units, Spr (Laughlin)

212. Numerical Methods for Physicists and Engineers—(Enroll in Applied Physics 215.)

3 units, alternate years, given 2001-02

215. Back of the Envelope Physics—Survey of topics intended to develop the ability to do simple, physically based calculations with undergraduate physics. Goal: sharpen ones physical intuition and promote a synthesis of physics at the undergraduate level through the examination of problems normally not usually included in undergraduate physics. Topics: practice in making order of magnitude estimates, applications of statistical mechanics, astrophysics and cosmology, biological physics, scaling concepts in physics, quantum interference and quantum measurement, geophysics, etc. Prerequisites: mechanics, statistical mechanics, electricity and magnetism, and quantum mechanics at the undergraduate level.

3 units, Aut (Linde)

220. Classical Electrodynamics—Electrostatics and magnetostatics: conductors and dielectrics, magnetic media, electric and magnetic forces and energy. Maxwell’s equations: electromagnetic waves, Poynting’s theorem, electromagnetic properties of matter, dispersion relations, wave guides and cavities, magnetohydrodynamics. Special relativity: Lorentz transformations, covariant, equations of electrodynamics and mechanics, Lagrangian formulation, Noether’s theorem and conservation laws. Radiation: dipole and quadrupole radiation, electromagnetic scattering and diffraction, the optical theorem, Liénard-Wiechert potentials, relativistic Larmor’s formula, frequency and angular distribution of radiation, synchrotron radiation. Energy losses in matter: Bohr’s formula, Cherenkov radiation, bremsstrahlung and screening effects, transition radiation. Prerequisites: 122 or equivalent; Mathematics 106 and 132, or concurrent registration in Physics 210 and 211.

210. 3 units, Win (Silbergleit)
211. 3 units, Spr (Zhang)

222. Applied Quantum Mechanics I—Graduate section; see 150.

3 units, Aut (Miller)

223. Applied Quantum Mechanics II—(Graduate section; enroll in Electrical Engineering 223.) See 151.

3 units, Spr (Miller)

230,231,232. Quantum Mechanics—Prerequisites: 132 and a strong course on differential equations.

230.—Fundamental concepts. Introduction to Hilbert spaces and Dirac’s notation. Postulates are applied to simple systems, including those with periodic structure. Symmetry operations and gauge transformation. The concept of propagators and path integral quantization. Problems related to measurement theory. The quantum theory of angular momenta and central potential problems (hydrogen, quarkonium).

3 units, Aut (Shenker)


3 units, Win (Chu)


3 units, Spr (Shenker)

240. Asymptotics Methods in Physics Problems—Use of the notion of asymptotics in physics. Algebraic equations, branching (eigenfrequencies of small oscillations). Asymptotic estimates of integrals (short and long time behavior, near and far field, group velocity and energy transport by waves); uniform asymptotics. Asymptotic methods for ODEs: coordinate and parameter asymptotics, regular and singular perturbations; WKB method (quasiclassical approximation, one-dimensional wave propagation); Poincare method, “fast” and “slow” variables (perturbation of periodic orbits, weak dissipation, adiabatic invariants); matched asymptotic expansions—boundary layers (problems of electrodynamics, heat conductivity, elasticity, etc.). Asymptotic methods for PDEs: ray method for multi-dimensional linear wave propagation (rays, wavefronts, least-time path principle, caustics for waves of different physical origin); matched asymptotic expansions—boundary layers and “thin” bodies (applications to electrodynamics, hydrodynamics and MHD, linear elasticity, etc.); multi-scale expansions: homogenization, effective parameters for composite bodies. Examples from various branches of physics (astrophysics and general relativity).

3 units

252. Introduction to High Energy Physics—Graduate section; see 152.

3 units, Spr (Dixon)

260. Introduction to Astrophysics—The basic properties of stars, galaxies, and the universe. Physical processes for production of radiation from cosmic sources. The structure and evolution of the universe and its
constituent galaxies and stars. Models of the early universe and the relation between particle physics and cosmology. Prerequisites: 111, 122, 171.
3 units

262. Introduction to Gravitation—Tensor analysis: special relativity, the energy-momentum tensor, and curvature. Einstein’s equations: weak fields, tests, spherically-symmetric solutions, gravitational waves. Cosmology, black holes, stellar structure, and other topics in astrophysics, as time permits. Prerequisites: 111, 122.
3 units

271. Introduction to Solid State Physics—Reviews key discoveries in condensed matter physics in the past 15 years, with emphasis on experiment. Topics: sliding charge density waves in layer compounds, the first pressure-induced Mott transition, the first organic superconductor, the discovery of superfluid 3H, quasicrystals, the Sharvin effect, the quantum hall effect, and re-entrant superconductivity. Journal club format, with presentations by students on assigned topics. Offered occasionally.
3 units

3 units, Aut (Harrison)

3 units, Win (Harrison)

290. Research Activities at Stanford—Required of all first-year physics graduate students and strongly suggested for junior physics majors for 1 unit; no registration needed for graduate students. Review of research activities in the department and elsewhere at Stanford at a level suitable for entering graduate students.
1-3 units, Aut (Gratta)

291. Practical Training—Opportunity for practical training in industrial labs. Arranged by student with the research advisor’s approval. A brief summary of activities is required, approved by the research advisor.
3 units, Sum (Staff)

293. Literature of Physics—Intensive study of the literature of any special topic. Preparation, presentation of reports. If taken under the supervision of a faculty member outside the department, approval of the Physics chair is required. Prerequisites: 25 units of college physics, consent of instructor.
1-15 units, any quarter (Staff)

294. Teaching of Physics Seminar—Required of all teaching assistants in Physics prior to or concurrent with the first quarter of the teaching appointment; registration not required. Techniques of teaching physics by means of weekly seminars/discussions, simulated teaching situations, and evaluation of in-class teaching performance.
1 unit, Aut (Pam)

301. Astrophysics Laboratory—Combined seminar/lab investigating the fundamental observational basis of physical models of astronomical objects. Observational component uses the 24-inch telescope at the Stanford Observatory and ancillary photometric and spectroscopic instrumentation. Emphasis is on spectroscopic and photometric observation of main sequence, post-main sequence, and variable stars. Limited enrollment. Offered occasionally. Prerequisite: consent of instructor.
3 units, Sum (Staff)

312. Basic Plasma Physics—For the nonspecialist who needs a working knowledge of plasma physics for space science, astrophysics, fusion, or laser applications. Topics: orbit theory, the Boltzmann equation, fluid equations, MHD waves and instabilities, EM waves, the Vlasov theory of ES waves and instabilities including Landau damping and quasilinear theory, the Fokker-Planck equation, and relaxation processes. Advanced topics in resistive instabilities and particle acceleration. Prerequisite: 210 or 220, or consent of instructor.
3 units, Spr (Staff)

320. Quantum Optics and Selected Topics in Atomic Physics—Quantization of the electromagnetic field, photon states, and vacuum fluctuations and atomic transitions of real atoms. Two-level atoms, the Optical Bloch Equations, dressed states, coherent transients, resonance fluorescence, laser cooling and trapping of atoms and ions, tests of quantum mechanics and Bell’s Theorem, photon statistics, coherence, antibunching, squeezed states, and parity non-conservation and time-reversal invariance tests in atomic physics. Offered occasionally.
3 units

3 units

322. Laser Cooling and Trapping—The fundamental principles of laser cooling and atom trapping. The general treatment of optical forces on atoms, the various forms of laser cooling, atom optics and atom interferometry, ultra-cold collisions, and Bose condensation of dilute gases. Emphasis is on the development of the general formalisms currently used to treat these topics. Applications of the cooling and trapping techniques: atomic clocks, internal sensors, measurements that address high-energy physics questions, studies of many-body effects, polymer science, and biology. Prerequisite: 231 or equivalent.
3 units

324. Introduction to Accelerator Physics—(Enroll in Applied Physics 324.)
3 units, alternate years, given 2001-02

330,331,332. Quantum Field Theory—Introduction to the concepts and methods of quantum field theory. Prerequisites: 210, 221, 232.
3 units, Aut (Kallosh)
331.—Loop diagrams, electron (g-2), renormalization, Ward Identities, the renormalization group, perturbation theory anomalies.
3 units, Win (Kallosh)
3 units, Spr (Linde)

351. Introduction to the Standard model—Features of high-energy interactions of hadrons; deeply inelastic lepton-hadron scattering; structure functions; the parton model; QCD, gluons, and scaling violations; jets and quark fragmentation in rr(LC) and e+e- annihilation to hadrons; radiative corrections in QED and QCD; running coupling
352.—Hadron spectroscopy in the static quark model; properties of heavy quarks and quarkonium systems. Weak interactions: muon, pion, and beta decay; weak mixing angles; the $K_L - K_S$ system on CP violation; charged and neutral current neutrino scattering; the standard model of electroweak interactions; determinations of $\sin^2(\theta_W)$; properties of $W$ and $Z$ bosons; gauge symmetries and the Higgs mechanism; properties of Higgs particles. Introduction to topics beyond the standard model: grand unification, proton decay, super-symmetry.

3 units

360. Physics of Astrophysics—Theoretical concepts and tools for modern astrophysics. Radiation transfer equations, and scattering and absorption processes: Compton, synchrotron photoionization, lines, and Bremsstrahlung. Equations of state of ideal, interacting, and degenerate gasses. Particle kinetic equations (Boltzmann, Fokker-Planck) and mechanisms for particle acceleration and transport. Application to ionization and dust scattering in HII regions and high-energy astrophysics sources such as accretion disks, x-ray and radio sources. Prerequisites: 122, 171.

3 units, Win (Petrosian)

361. Stellar and Galactic Astrophysics—Basic astronomical data on stars, star clusters, interstellar medium, and the Milky Way galaxy. Basic theory of stellar structure; hydrostatic equilibrium, radiation balance, and energy production. Stellar formation, Jean’s mass and protostars. Evolution of stars to the main sequence and beyond to red giants, white dwarfs, neutron stars, and black holes. Structure of the Milky Way; the disk and spiral arms, central bulge or bar, black hole, the halo, and mass of the galaxy. Prerequisites: 221, and 260 or 360.

3 units, Spr (Petrosian)

362. Extragalactic Astrophysics and Cosmology—Basic observational data on galaxies and their activities, cosmic microwave background radiation, gravitational lensing and dark matter in the universe. Models of the origin, structure, and evolution of the universe based on the theory of general relativity. Test of the models. Physics of the early universe, inflation, Baryosynthesis, nucleosynthesis, and galaxy formation. Prerequisites: 210, 211, 260 or 360, 262.

3 units

363. Solar and Solar-Terrestrial Physics—Structure, mechanisms, and properties of the sun’s interior and atmosphere; solar wind and its variability; solar activity; coronal mass ejections; UV, x-ray, and high-energy particle emission. Earth’s magnetosphere. The interaction of the solar wind with the earth’s magnetosphere and its terrestrial effects. The sun’s electromagnetic radiation effect on the terrestrial environment. Prerequisite: 221 or equivalent.

3 units (Kosovichev) alternate years, given 2001-02


3 units, Aut (Wagoner)


3 units

372. Condensed Matter Theory I—(Enroll in Applied Physics 372.)

3 units, alternate years, given 2001-02

373. Condensed Matter Theory II—(Enroll in Applied Physics 373.)

3 units, alternate years, given 2001-02


3 units
463. Special Topics in Astrophysics—Research-level discussions of current topics in astrophysics. Content varies each quarter and year, depending on the interests of staff and students. Topics to be announced. Offered occasionally.

3 units

473A. Condensed Matter Physics—(Enroll in Applied Physics 473A.)
2 units, Aut (Greven)

Spr (Kapitulnik)

3 units, Win (Kapitulnik)

3 units, Spr (Doniach)

490. Research Orientation—Familiarizes students with the activities of one or more research groups, within the department or outside. Registration limited to one quarter per research group with overall limitation of two quarters. Prerequisite: consent of student's advisor.

1-15 units, any quarter (Staff)

491. Research—Open only to graduate physics major students, with consent of instructor. Work is in experimental or theoretical problems in research, as distinguished from independent study of a non-research character in 190 and 293. If taken under the supervision of a faculty member outside the department, Physics Graduate Study Committee approval required.

1-15 units, any quarter (Staff)

POLITICAL SCIENCE


Chair: Barry R. Weingast


Associate Professors: James D. Fearon, Luis R. Fraga, Scott D. Sagan Assistant Professors: Claudine Gay, Simon Jackman, Beatriz Magalonni (on leave 2000-01), Isabela Mares, Michael A. McFaul (on leave Autumn), Rob Reich, Michael A. Tomz, Carolyn Wong, Anne Wren

Professor (Research): Norman Nie

Courtesy Professors: David P. Baron, Jonathan B. Bendor, Coit Blacker, Bruce Bueno de Mesquita, Gerhard Casper, Steven H. Chaffee, Larry Diamond, Gerald Dorfman, Jean-Pierre Dupuy, Lawrence Friedman, Keith Krehbiel, Gail Lapidus, James Morrow, Roger Noll, Michael Oksenberg

Courtesy Associate Professors: Michael J. Gosecose, Debra M. Saiz

Senior Lecturer: Stephan Steedman

Lecturers: Alison Alter, Adrienne Jamieson

Visiting Professors: Norman Jacobson, Barry O'Neill, Walter J. Stone

Affiliated Professors: Michael W. Kirst, Michael M. May

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

To receive an A.B. in Political Science, a student must:

1. Begin by submitting an application for the Political Science major to the undergraduate administrator. Forms are available in Building 160, room 161H1. For additional information, drop by or phone (650) 723-1608.

2. Complete 60 units, at least 50 of them in Political Science courses. Up to 10 units may be from courses outside the department that are related to the student's interests in political science and are not entry-level courses in other disciplines (such as Economics I or Psychology I). All courses counted for the degree must be taken for a letter grade.

3. Satisfy a depth requirement. Each major should declare a primary concentration in one subfield and take at least 20 units in this concentration, including the introductory course for that subfield. Subfields include:

- Public Administration and Public Policy (100-109, 206-209)
- Comparative Politics (110-129, 210-229)
- International Relations (130-149, 230-249)
- Political Theory (150-169, 250-269)
- American Politics (170-198, 270-298)

A student may propose an individual primary concentration in a special subfield, for example, politics in advanced industrial democracies, political organizations, public policy, the politics of development, or formal models in political science. This concentration proposal is subject to the approval of the Director of Undergraduate Studies.

4. Satisfy a breadth requirement. Each major should declare a secondary concentration in another subfield, with at least 10 units in that concentration.

Each major should take at least 5 units in a third subfield. A secondary concentration may be designed by the student and is subject to the approval of the Director of Undergraduate Studies.

5. Demonstrate the capacity for sustained research and writing in the discipline. This requirement is satisfied by taking a Political Science course which has been designated a Writing in the Major (WIM) course.

6. Take at least one 5-unit seminar in Political Science.

7. A maximum of 20 units of transfer work may be given Political Science credit toward the major.

8. Directed reading units may not be used to fulfill a distribution requirement, and no more than 10 units of directed reading may count toward the 50 Political Science units.

9. All courses counting toward the 60-unit requirement must be taken for a letter grade, although units in excess of the required 60 may be taken on a credit/no credit basis.

MINORS

Students must complete their declaration of the minor no later than the last day of the quarter two quarters before degree conferral. For example, a student graduating in June (Spring Quarter) must declare the minor no later than the last day of Autumn Quarter of the senior year.

To receive a minor in Political Science, a student must complete a minimum of 18 unduplicated units. All units must be in courses listed or taken on a credit/no credit basis.

All units are for a letter grade.

Concentration—The student selects a subfield in which three courses are taken. Ordinarily one of these courses is at the introductory level (numbered under 100), the other two at the advanced level (numbered above 100). Where a linked set of advanced courses is offered (as with the Political Theory 151A, B, C series), an introductory course need not be taken.

Ordinarily the concentration corresponds to one of the subfields the department already has in place, namely, American politics, compara-
tive politics, international relations, political organizations, and political theory. An alternative way of defining a subfield is acceptable, however, if a sufficient number of courses is offered and if the student’s proposal is accepted by the department.

Distribution—Three courses must be in the area of concentration, as specified above, for 15 units. An additional 10 units of advanced courses (100 level or above) must be in two additional subfields.

Transfer Work—A maximum of 10 units of transfer work may be given Political Science credit toward the minor, upon approval.

PRIZES

There are four annual prizes for undergraduate students: the Edwin A. Cottrell Memorial Prize for the best student in Political Science 1, the Arnaud B. Leavelle Memorial Prize for the best paper in the History of Political Thought sequence (Political Science 151A,B,C), a cash prize for the best thesis written in political theory, and the Lindsay Peters, Jr., Memorial Prize for the outstanding student each year in Political Science 10.

HONORS PROGRAM

This program offers qualified students an opportunity to conduct independent research and to write a thesis of superior quality summarizing the results of their research. It provides for close contact between students and their advisers, so that students can receive intensive guidance and assistance throughout their research and writing. The aim is to help students through the process of research, analysis, drafting, rethinking, and redrafting essential to excellence in writing.

The basic requirement for admission to the program is that students secure the agreement of a regular faculty member to be their thesis adviser. No faculty member can effectively supervise more than a few honors theses each year. Application to the program should therefore be made as early as possible, preferably by Spring Quarter of the junior year. Application forms can be obtained from the department office, should be countersigned by both the student and his or her thesis adviser, and then approved by the Director of the Honors Program. Normally, the thesis adviser is a faculty member with whom the student has already worked. To be eligible for the program, students must have at least a 3.5 grade point average (GPA) in Political Science courses when they apply. They should enroll in the program at the start of the Autumn Quarter of the senior year and take Political Science 199R, a 2-unit Autumn Quarter seminar focusing on research and writing skills. If a student is not on campus during that quarter, an equivalent to 199R should be taken.

The program is based on the assumption that good writing takes time. Students are, therefore, strongly discouraged from attempting to complete an honors thesis in less than three quarters. While details are worked out on an individual basis between students and their advisers, the following patterns are typical: (1) if a student already has substantial background on the thesis topic, the honors thesis program can be completed in two or three quarters (for a total of 10-15 units); (2) if a student has done little or no previous work on the topic, then the program should be spread over three quarters (for a maximum of 15 units).

Successful completion of honors in Political Science requires (1) completion of all requirements for the major, (2) enrollment in Political Science 199R, and (3) successful completion of a thesis of honors quality ('B+' or better). Honors work done for credit (Political Science 199) may not be counted toward the required 50 units in Political Science but may be counted as all or part of the additional 10 units which relate to the student’s interest in political science.

GRADUATE PROGRAMS

Admission—Prospective graduate students should write to Graduate Admissions, the Registrar’s Office for application materials. All applicants are required to submit a sample of their writing and to take the General Test of the Graduate Record Examination. Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL) and the Test of Spoken English (TSE). The TOEFL and TSE requirements are waived for applicants who have recently completed two or more years of study in an English-speaking country. For details concerning these tests, see the Guide to Graduate Admission. The application deadline is January 1. Admission is offered for the Autumn Quarter only. The department expects all students to pursue a full-time program except for time devoted to teaching or research assistantships.

MASTER OF ARTS

The University’s basic requirements for the master’s degree are discussed in the “Graduate Degrees” section of this bulletin.

Applicants for the A.M. program are selected on the basis of the same criteria as Ph.D. candidates. Financial aid is not available to applicants for the A.M. program. The department offers a terminal A.M., or the A.M. degree may be pursued as part of a joint degree program with one of the University’s professional schools. Students interested in a joint degree should apply for admission to the A.M. program in Political Science during Autumn Quarter of the first year in the Stanford professional school.

Terminal A.M. students, and doctoral candidates who wish to apply, are awarded the A.M. degree when they have met the following requirements:

1. Completion of at least three quarters of residency as a graduate student with 45 units of credit, of which at least 25 units must be taken in Political Science graduate seminars of 200-level and above. Not more than 25 units of the 45-unit requirement may be taken in a single field.
2. The student shall take at least two seminar seminars in each of two fields and at least one seminar seminar in a third field.
3. Of the remaining 20 units, not more than 10 units of work from related departments may be accepted in lieu of a portion of the work in political science. Not more than 10 units can be taken as directed reading.
4. Courses must be numbered above 100.
5. A grade point average (GPA) of 'B-' or better must be attained for directed reading and all course work.

Students receiving the A.M. degree from Stanford are not given preference for admission to the Ph.D. program. They must apply for admission in the regular manner and are subject to the same selection process as other applicants. The department does not offer a coterminal bachelor’s and master’s degree program.

MASTER OF ARTS IN TEACHING

The A.M. of Arts in Teaching is offered jointly by this department and the School of Education. The degree is intended for candidates who have a teaching credential or relevant teaching experience and wish to further strengthen their academic preparation. The program consists of a minimum of 25 units in Political Science courses and 12 units in the School of Education. A student’s program must be approved by the Director of Graduate Studies before the courses are taken. Detailed program requirements are outlined in the “School of Education” section of this bulletin.

DOCTOR OF PHILOSOPHY

The University’s basic requirements for the Ph.D. degree are discussed in the “Graduate Degrees” section of this bulletin.

Programs of study leading to the Ph.D. degree are designed by the student, in consultation with advisers and the Director of Graduate Studies, to serve his or her particular interests as well as to achieve the general department requirements. A student is recommended to the University Committee on Graduate Studies to receive the Ph.D. degree in Political Science when the following program of study has been completed:

1. The candidate for the Ph.D. degree must offer three of the following concentrations in political science: American politics, comparative politics, international relations, political theory, and public organizations. Upon petition, a special field (for example, methodology, public law, or urban politics) may be offered as a third concentration. Students concentrate on two of these areas by fulfilling, depending on the concentration, combinations of the following: written qualifying examinations, research papers, research design, or course work. The requirement for the third concentration may be satisfied by taking either a written examination in that area or by offering a mini-
1. The candidate must complete a dissertation satisfactory to the Dissertation Reading Committee and the University Committee on Graduate Studies.

2. The Ph.D. candidate is required to demonstrate competence in a language and/or skill that is likely to be relevant to the dissertation research. The level of competence needed for successful completion of the research is determined by the student's adviser. All candidates must complete 5 units of statistical methods or its equivalent. Students who are in the concentration of international relations, American politics, or public organizations are required to take an additional 5 units of methods. Previous instruction can be counted towards this requirement only if approved by the Director of Graduate Studies.

3. If the candidate has not completed at least one year of previous undergraduate instruction in political theory, or at least 5 quarter units of graduate political theory, he or she must take 5 quarter units of graduate instruction in political theory.

4. By the start of the fourth quarter in residence, each first-year graduate student submits to the student's adviser a statement of purpose. This statement indicates the student's proposed major concentrations of study, the courses taken and those planned to be taken to cover those fields, the student's plan for meeting language and/or skill requirements, plans for scheduling of comprehensive examinations and/or research papers, and, where possible, dissertation ideas or plans. This statement is discussed with, and must be approved by, the student's adviser. In the Autumn Quarter following completion of their first year, students are reviewed at a regular meeting of the department faculty. The main purposes of this procedure are, in order of importance: to advise and assist the student to realize his or her educational goals; to provide an incentive for clarifying goals and for identifying ways to achieve them; and to facilitate assessment of progress toward the degree.

5. When both the student and adviser feel that the student is ready, he or she takes comprehensive examinations in two concentrations and completes one research paper. Comprehensive examinations are offered at the discretion of the faculty. If scheduled, they are given in the third week of Autumn and Winter quarters, and in the seventh week of Spring Quarter. Students should normally expect to complete these examinations and the research paper by the end of their second year.

6. Upon completion of one research paper and two comprehensive exams in his or her two major concentrations, the student files an Application for Admission to Candidacy for the Ph.D. which details program plans and records. This document, along with a student's examination performance, is reviewed by the faculty at a regular meeting. If it is approved, the student is advanced to candidacy. Students must be approved to candidacy by the completion of their sixth quarter as a full-time student.

7. During the third year, a formal dissertation proposal is submitted by the student to a thesis committee of three faculty members, including the principal adviser.

8. A candidate for the Ph.D. in Political Science is required to serve as a teaching assistant (TA) in the department for a minimum of two quarters.

9. Doctoral candidates who apply for the A.M. degree are awarded that degree on completion of the requirements outlined in the description of the A.M. program.

10. The candidate must pass the University oral examination on the area of the dissertation at a time, after the passing of the written comprehensive examinations, suggested by the candidate's dissertation committee.

11. The candidate must complete a dissertation satisfactory to the Dissertation Reading Committee and the University Committee on Graduate Studies.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

Summer Quarter—During Summer Quarter, the Department of Political Science offers a variety of courses and seminars. The specific offerings depend on the faculty available during the Summer Quarter.

The department uses the following course numbering system:

1-99 Introductory Courses

100-199 Advanced Courses and Undergraduate Seminars (at the instructor's discretion, graduate students may enroll and be given graduate credit when additional work is assigned and the appropriate department Graduate Credit Authorization form is completed)

200-299 Graduate Undergraduate Seminars (principally for graduate students; at the instructor's discretion, undergraduates may be admitted)

300-400 Graduate Seminars

Course information is accurate when the Stanford Bulletin goes to press; however, students should be aware that there may be changes and should check the quarterly Time Schedule for up-to-date information.

INTRODUCTORY

1. Introduction to Political Science—Alternative public policies in selected areas, including control of monopoly, poverty, and foreign policy. The political process: the influence of cultural, economic, and political factors and the location of political power in determination of public policy.

5 units (Staff) given 2001-02

10. American National Government and Politics—The role and importance of the ideal of democracy in the evolution of the American political system. American political institutions (the Presidency, Congress, and the Court) and political processes (the formation of political attitudes and voting) are examined against the backdrop of American culture and political history. The major areas of public policy in the current practice of the ideal of democracy. GER:3b (DR:9)

5 units, Win (Ferejohn, Fiorina)

20. Comparing Political Systems—In what ways are political systems similar? How do they differ? What are some of the causes and consequences of the differences? How and why do governance patterns change? These questions are addressed through a systematic study of political institutions and processes in several countries.

5 units (Staff) given 2001-02

21N. Stanford Introductory Seminar: The Politics of Labor in Advanced Industrial Democracies—Preference to freshmen. The emergence of compromise between labor and capital in post-war Europe
and its impact on economic performance. What was the role of labor in the development of solidaristic wage policies and the expansion of a redistributive welfare state? What are the obstacles faced by social-democratic governments in their pursuit of full-employment policies during the last two decades? How do the new constraints posed by increased economic globalization and the creation of a common market affect the political sustainability of this cross-class-compromise? GER:3b (DR:9)

3 units, Spr (Reich)

24N. Stanford Introductory Seminar: The Politics of Economic Development—Preference to freshmen. The politics of economic development in lower income countries. The tools of political science and economics explain the economic policies that governments adopt, and the extent these policies help or hinder economic performance. The origins and consequences of fiscal and monetary policies, environmental regulations, welfare programs, and openness to international finance and trade. Conceptual and historical material from different geographic regions, focusing on Latin America.

5 units, Spr (Tomz)

25. Colonialism and Nationalism in the Third World—Comparative historical analysis of European exploration, conquest, and colonial rule in Latin America, the Caribbean, Africa, and Asia. Factors affecting the timing, character, and effectiveness of nationalist movements in the Third World. The impact of colonialism on postcolonial political and economic systems.

5 units (Abermethy) given 2001-02

28. East Asia in the Age of Imperialism—(Same as 128.) Designed primarily for freshman and sophomores; with supplementary reading can be taken as upper-level course. Interdisciplinary introduction to E. Asian political, social, cultural, and economic evolution 1840 to 1945. The various responses in China, Japan, and Korea to Western penetration of the region. (WIM)

5 units (Okkeng, Duus) not given 2000-01

29. Contemporary East Asia—(Same as 129M.) Designed primarily for freshmen and sophomores; with supplementary reading can be taken as upper-level course. An introduction of E. Asian history and cultures from the end of WW II to the present. Focus is on long-standing interactions among Japan, Korea, China, and the peripheries of Central, S.E., and S. Asia. Issues: politics, economic development, and common challenges for the region as whole. GER:3b (DR:9) (WIM)

5 units, Spr (Staff)

35. International Politics—(Same as 135.) Approaches to the study of world politics including realism, liberalism, and decision-making theories. WW I, the nuclear weapons debate, and contemporary and economic problems. The normative and policy implications of different theories.

GER:3b (DR:9)

5 units, Aust (Mitchell)

51D. Introduction to Political Philosophy/Theory—(Enroll in Philosophy 30, Public Policy 103A.)

5 units, Aust (Satz)

52Q. Stanford Introductory Seminar: Ethical Issues in Public Service—Preference to sophomores. The ethical issues that arise in public service work. Are good motivations or intentions enough to bring about good outcomes? Is service best seen as a response to misfortune or injustice? Would service be necessary in a just world? What is the connection between theory and practice? Students participate in service work and bring those experiences to bear on readings designed to foster reflection and dialogue. Prerequisite: 159R.

5 units, Spr (Reich)

60. The American Dream—Critical analysis of America's dominant ideology, the American Dream, as experienced by women, minorities, labor, Indians, and immigrants. GER:3b,4b (DR:5 or 9)

5 units, Win (Manley)


3 units (Fraza) not given 2000-01


5 units, Win, Spr (Moe)

93N. Stanford Introductory Seminar: Politics and Economic Inequality in Advanced Industrial Democracies—Preference to freshmen. How does government partisanship influence patterns of economic performance and economic inequality? Do political parties representative of different ideological traditions choose to pursue different types of economic and distributional goals? How do they interact with organized labor and capital interests in the pursuit of these goals? Are they considered in the type of goals they can pursue by the structure of the international economy? By the preferences of voters and the structure of the electorate? Or by international institutions such as the EU? Covers Western Europe and N. America.

5 units, Spr (Wren)

95A. Introduction to Political Data Analysis I—Introduction to applied data analysis techniques commonly employed by political scientists and policy analysts. Emphasis is on application and hands-on experience with political data, rather than mathematical derivations and statistical theory. Computer applications that support data analysis in the social sciences. The basic elements of research design and causal analysis using survey data on the American electorate and data on other substantive problems.

5 units (Stone) not given 2000-01

95B. Introduction to Political Data Analysis II—Introduction to applied regression analysis using a variety of substantive examples and data from political science and policy analysis. The logic of hypothesis testing and control in post-hoc designs commonly used by political scientists and policy analysts. Topics: the graphical presentation of data, bivariate and multivariate regression analysis, inference, and assumptions. Emphasis is on the application of the techniques to data analysis and research problems. Prerequisite: 195A or consent of instructor.

5 units (Stone) not given 2000-01

95C. Introduction to Political Data Analysis III—Review of data sources in political science and related fields, including archived data, data sources on the Web, and documentary sources. Emphasis is on developing each student's independent experience with research, applying appropriate principles of research design, data management, data analysis, and on the presentation and evaluation of results. Prerequisite: 195B or consent of instructor.

5 units (Stone) not given 2000-01

ADVANCED UNDERGRADUATE

Advanced undergraduate courses are open to undergraduates who have the necessary prerequisites, and to graduates where advisable. Undergraduate seminars have limited enrollments and admission generally requires consent of instructor. They are intended for juniors and seniors, but may admit graduate students. Sign-up sheets for undergrad-
bureaucrats, and interest groups shape government policies in various fields, including nonlinear estimation, large sample theory, and applications to political science and public policy.

**GENERAL**

**100A. Statistical Methods I**—(Same as 200A.) Introduction to probability and statistical inference, with applications to political science and public policy. Prerequisite: elementary calculus.
- 5 units, Aut (Fearnan)

**100B. Statistical Methods II**—(Same as 200B.) Understanding and using the linear regression model in a social-sciences context: properties of the least squares estimator; inference and hypothesis testing; assessing model fit; presenting results for publication; consequences and diagnosis of departures from model assumptions; outliers and influential observations; graphical techniques for model fitting and checking; interactions among explanatory variables; pooling data; extensions for binary responses.
- 5 units, Win (Staff)

**100C. Statistical Methods III**—(Same as 200C.) Models for discrete outcomes, time series, measurement error, and simultaneity. Introduction to nonlinear estimation, large sample theory.
- 5 units (Jackman) not given 2000-01

**POLITICAL ORGANIZATIONS**

The courses and seminars listed below are open to all undergraduates in the University regardless of major. There are no prerequisites. There are no formal course sequences in public administration.

**101P. Politics and Public Policy**—(Same as Public Policy 101.) The domestic policy-making process, emphasizing how elected officials, bureaucrats, and interest groups shape government policies in various areas including tax, environmental, and social-welfare policy, given their goals and available tactics. How public policies are formulated and implemented. The results of this process using equity and efficiency criteria. Prerequisite: 1 or 10.
- 5 units, Spr (Brady)

**103R. Managing Public Policy: Seminar**—(Enroll in Public Policy 185.)
- 5 units, Aut (Printup)

**104. Seminar: Urban Policy**—Issues of public finance, housing, education, transportation, and crime in major metropolitan areas in the U.S. Students are placed in internships in government departments, social service agencies, or community-based organizations. Required policy brief to the organization. (WIM)
- 5 units, Aut (Fraga)

**109. Directed Reading/Research in Political Organizations**—Advanced individual study in public administration. Any quarter (Staff)

**COMPARATIVE POLITICS**

Undergraduate courses and seminars in comparative politics generally fall into two groups: those dealing with a particular country or region, and those dealing with major political problems or processes. Students concentrating in comparative politics are encouraged to take courses from both groups, and are also urged to do course work in more than one country or region.

**110. Methodology in Comparative Politics**—Explanations for cross country differences on several political outcomes (e.g., whether a country has become democratic, or nationally homogeneous, or whether it has experienced a revolution). Case studies in five countries are used as tests of alternative theories that seek to explain differences in outcome.
- 5 units, Win (Laitin)

**111D. British Politics**—Britain has experienced a remarkable cycle of change in its politics the last two decades. After a prolonged period of political and economic instability, Prime Minister Thatcher and her Conservative Party established in 1979 a one-party dominance that persisted until 1997. Changes in British policy, and the revival of political competition in the years ahead. GER:3b (DR:9)
- 5 units, Spr (Dorfman)

**112M. Latin American Politics**—The last two decades have witnessed a wave of democratization and a fundamental shift in economic policy in virtually all Latin American countries. Competitive elections have established themselves as a means to elect governments at a time when runaway inflation, balance-of-payment crises, and other symptoms of macroeconomic instability led governments to embrace so-called "neoliberal" economic policies and market reforms. The determinants of individual voting behavior in such "transitional" contexts, how institutions and electoral rules shape emerging party systems, the dynamics of electoral competition, and the effects of partisan governments and regular elections on public policies and political-economic outcomes.
- 5 units (Magaloni) not given 2000-01

**113A. Politics and Development in Latin America**—Survey of political, economic, and social development in selected Latin American countries (normally Brazil, Mexico, Argentina, and Cuba) and analysis of policy and theoretical issues such as ideologies of development, democracy and its alternatives, constraints on national autonomy, and civil-military, state-society, and state-market relations. Student papers on any country in the region.
- 5 units, Win (Packenham)

**114K. Political Economy of Development**—Introduction to the major theories of political development, emphasizing the interplay between political economic processes, and national and international factors from Latin America, Africa, and Asia. Cases: S. Africa, Chile, Brazil, Mexico, Taiwan, China, India, and the oil-exporting countries.
- 5 units (Karl) not given 2001-02

**115A. China under Mao**—(Enroll in Sociology 117A; same as 215A.)
- 5 units, Aut (Walder)

**115B. Chinese Politics: The Transformation and the Era of Reform**—(Same as 215B.) The content, process, and consequences of reform in China from 1976 to the present. Changes in property rights, markets, credit, and the role of the state in economic development.
- 5 units, Win (Oi)

**116L. Comparative Democratic Development**—(Same as 216L.) The social, cultural, political, economic, and international factors favorable to the development and consolidation of democracy, in historical and comparative perspective. Worldwide development and the reemergence of democracy in the past decade. Case studies of individual country experiences with democracy.
- 5 units (Diamond) given 2001-02

**117K. The Global Politics of Human Rights**—The global development of human rights and the rise of an international human rights movement. The changing nature of rights and various dilemmas, e.g., conflicts between national sovereignty and rights, conflicts between various types of rights, etc., through specific case studies, including genocide in Rwanda, holding torturers accountable in Chile and El Salvador, factory workers vs. Nike, and the rights of women in South Africa.
- 5 units, Win (Karl)

**118A. Political Change in Tropical Africa**—The colonial situation, growth of nationalism, achievement of political independence, ethnic patterns in new states, civilian and military leadership, the role of party and bureaucracy, movements for electoral democracy, succession strug-
gles and civil war, problems in stimulating economic development, and efforts at regional integration. GER:4a (DR:2)
5 units (Abernethy) given 2001-02

118B. The Politics of Race and Class in Southern Africa—The political history of the region's 10 countries, emphasizing relations among racial and ethnic groups. Diplomatic, economic, and military interactions among these states. The impact of movements, corporations, and international organizations based outside the region. Domestic politics in South Africa, emphasizing struggles over the character of post-apartheid society. GER:3b (DR:9)
5 units, Aut (Abernethy)

119M. Seminar: Revolutions—While "revolutions" mark important turning points in the modern world, the causes and consequences of revolutions are poorly understood. Given the limited number of cases, theorizing about revolutions is underdeveloped, underspecified, and outdated. Seeks a study of revolutions as a legitimate focus for theoretical inquiry by reviewing structural, institutional, cultural, and rational choice approaches. Case studies focus on testing and applying recent theories of political change to classic revolutionary cases. (WIM)
5 units, Win (McFaul)

120A. Comparative West European Institutions—(Same as Public Policy 160, International Relations 160.) How institutions shape politics and policies in Western Europe. Electoral laws, parliamentary systems, and government institutions at the national level influence the quality and nature of representation, political competition, and policy outcomes. Institutional developments at the subnational level and within the European Union challenge the domestic politics and policies of the European nation states.
5 units, Aut (Alter)

121A. Seminar: Comparative Political Economy of Post-Socialist Transitions—(Same as Public Policy 161, International Relations 161.) The post-Socialist economic and political transitions ongoing in Eastern Europe and the former Soviet Union, investigating attempts to build market economies and democratic governments. The politics of constitutional choice and variation in reform strategies and outcomes across the cases. Prerequisites: Economics 1, Political Science 1 or 10.
5 units, Aut (Alter)

121M. Russian Politics—The evolution of the present Russian political system. The Soviet system, tracing its collapse. Attempts at reform of the Soviet system, beginning with Khrushchev and ending with Gorbachev. The emergence of Russian post-communist political institutions, including the Russian federal system, executive-legislative relations, political parties, and lobbies. The relationship between political and economic reform in post-communist Russia.
5 units, Spr (McFaul)

122W. Politics and Economic Policy in Advanced Industrial Democracies—Political economic approaches to the understanding of patterns of economic policy-making and performance in the advanced industrial democracies of Western Europe and N. America. What is the role of political ideology and government partisanship in influencing economic outcomes? How do the political parties interact with organized interest groups in the formation of economic strategies? Can voters influence patterns of economic policy-making and, if so, how is this influence felt? How heavily should domestic factors be weighed in explanations of economic outcomes? What are the cross-national impacts of "globalization" and the increasing openness of trade and capital markets? What constraints are placed on domestic political actors by the development of supranational political organizations like the EU?
5 units, Win (Wren)

124M. Seminar: European Political Development—An analysis of the central processes behind the development of modern European states. Topics: transitions from feudalism, the development of modern bureau-
disciplines and critical analyses to the study of peace; and to prepare students to think critically and to act responsibly and effectively on behalf of peace. Eight sections: challenges, enemies, theoretical understandings, justice, security, non-violence, public peace processes, peace and you. Seminar format once a week. Limited enrollment. GER:3b (DR:9)

134A. Strategy, War, and Politics—Traditional and modern theories on the causes of war and sources of peace. Contrasting explanations for the origins of WW I and II; alternative theories of deterrence in the nuclear age; the causes of war in the Persian Gulf, ethnic conflicts, and terrorism in the post-Cold War era. GER:3b (DR:9) (WIM)

134B. America and the World Economy—Analysis of American foreign economic policy. Issues: the evolution of American tariff and trade policy, the development of mechanisms for international monetary management, and American foreign investment policy reflected in the changing political goals pursued by American central decision-makers. Prerequisite: 35 or equivalent. GER:3b (DR:9) (WIM)

134P. Technology in National Security—(Enroll in Management Science and Engineering 193; same as 234P.)

3 units, Aut (Perry)

135. International Politics—See 35. Limited to students with graduate standing.

5 units, Aut (Mitchell)

137F. Nationalism and International Conflict—Nationalism is a leading candidate as the most important source of conflict between and within states after the Cold War. How the scholarly literatures on nationalism and war might be integrated and used to shed light on post-Cold War international politics. Theories and evidence on war and the international system, largely from Europe since 1648. Theories and evidence on the nature and origins of nationalism. Arguments about how nationalism causes (and is caused by) international conflict. The application of these ideas in several regions. (WIM)

5 units (Fearon) not given 2000-01

138. International Security in a Changing World—(Same as Management Science and Engineering 195.) Surveys the major international and regional security problems in the modern world. Interdisciplinary faculty lecture on the political and technical issues involved in arms control, the military legacy of the Cold War, regional security conflicts, proliferation of advanced weapons capabilities, ethnic conflicts, and peacekeeping efforts. GER:3b (DR:9)

5 units, Win (Blacker, May, Perry, Sagan)

138B. International Negotiation—Almost every major international event or continuing institution has been shaped by a negotiation. A negotiator can balance the push for a favorable outcome against the risk of a disagreement. Topics: agency in negotiation, coalitions, threats and promises, the agenda, symbolic moves, single- vs. multi-issue negotiations, the relevance of information about the other party, bargaining chips, mediation, bargaining in good faith, and honesty. Experiential learning, where students take on assigned roles in negotiation, then analyze and discuss their strategies and experiences.

5 units, Spr (O’Neill)

139A. Japanese Foreign Policy—Analysis of the origins of WW II in the Pacific; Japan’s role in international security; and the U.S.-Japan trade conflict.

5 units, Aut (Okimoto)

139B. Seminar: Foreign Policy Decision-Making—Foreign policy events are unusually well documented; sometimes transcripts of leaders’ deliberations are available, making these cases uniquely valuable ways to explore theories of real decision-making. Cognitive psychology, organizational behavior, and decision analysis are joined with history and international relations. Topics: belief systems and operational codes; symbolic, analogical, and metaphorical thinking; counterfactual reasoning; motivated misperception, hindsight, probability biases and other heuristics; utility theory, and its alternatives, including prospect theory and other approaches; decision making under the pressure of a crisis; and organizational influences on decisions.

5 units (O’Neill) not given 2000-01

140M. Chinese Foreign Policy—(Same as 240M.) Introductory. The origins of Chinese foreign policy. China’s intentions, capabilities, and strategies in world affairs since 1949, Chinese crisis behavior, and national security institutions and processes.

5 units (Oksenberg) not given 2000-01

143F. Explaining Ethnic Violence—Two forms of “ethnic violence” have been particularly deadly since 1945: violence associated with civil wars where the combatants claim to represent ethnic groups, and violence associated with ethnic riots. Case studies of examples, and a survey of theoretical work on the sources and nature of ethnic violence. (WIM)

5 units, Win (Fearon)

143S. Major Issues in International Conflict Management—Surveys contemporary issues of international conflict management: conflict prevention, mediation and implementation of peace agreements, peacekeeping, peacemaking, and humanitarian intervention. Topics: ethical dilemmas of conflict management, evaluation of international, regional, and non-governmental organizations in conflict management, the future of the UN, and the use of economic sanctions.

5 units, Win (Stedman)

149. Directed Reading/Research in International Relations—Advanced individual study in international relations. any quarter (Staff)

POLITICAL THEORY

Note—151A,B,C may be taken independently of one another.

151A. History of Political Thought I: Ancient, Classical, and Christian Worlds—(Same as 251A.) The changing relationship between political rule and individual achievement in Greek, Roman, and early Christian thought. Readings: Plato, Aristotle, Sophocles, Cicero, the Bible, Augustine, and Aquinas. GER:3a (DR:8)

5 units, Win (Connolly)

151B. History of Political Thought II: The Origins of Modern Democracy—(Same as 251B.) An analysis of early modern political theory, focused on major thinkers such as Machiavelli, Hobbes, Locke, and Rousseau. How the ideas of equality and liberty developed in two distinct though sometimes intertwined modes of thought about politics: republicanism and liberalism. How political thought became secularized during the period from the Renaissance to the French Revolution. GER:3a (DR:8)

5 units, Aut (Jacobson)

151C. History of Political Thought III: The Age of Revolutions—(Same as 251C.) The intellectual struggles since the French Revolution regarding the possibility and desirability of founding a new, rational political authority which respects individual freedom and rights, an authority not bound by tradition. Readings: Burke, Paine, Marx, Mill, Dostoyevsky, Arendt, Camus, Nietzsche. GER:3a (DR:8)

5 units, Spr (Hardin)

155S. Seminar: Rousseau and His Times—(Same as 255S.) A close reading of many of Rousseau’s major writings about politics (broadly understood) against the backdrop of the French Enlightenment. By reading Discourses, The Social Contract, Emile, part of La Nouvelle
Heloise, the Letter to Monsieur d’Alembert on the Theater, Reveries, and a few shorter writings, his thought is understood in its intellectual and political context. A background in the French Enlightenment and 18th-century political and social history. Rousseau’s short works or parts of works by his contemporaries, and the interconnections between Rousseau’s psychology and life experience with his thoughts about love, the arts, gender, and politics.

5 units (Okin) not given 2000-01

157. Seminar: Morality and Law—Is there a moral basis to law? The contemporary arguments of Richard Posner and Ronald Dworkin, focusing on positive or legal rights. The institutions for regulating various interactions. The justifications for rights and institutional arrangements. Strategic and normative considerations. The forms of justificatory argument under various moral theories and the differences between purely proceduralist and substantive justifications. The game theoretic or strategic structures of social interactions. Cases and legislative enactments according to the apparent strategic structures of the problems being adjudicated or addressed by legislation. The differences between the justification of a policy and the justification of actions under the policy. The difference between institutional and individual level justifications in the law, including alternative rights assignments, corrective justice, and professional ethics.

5 units, Win (Hardin)

158R. Children’s Citizenship: Justice across Generations—The notion of children’s citizenship, focusing on the major social institutions that assume responsibility for the civic education of children: schools, families and communities, and civil society. How does each institution develop citizenship? What is the relationship between civic education in its current forms and the reproduction of social equality and/or inequality? Do children’s rights as citizens differ from the rights of adult citizens? Readings: political theorists on justice, feminist theorists on the family and children, several court cases on the tensions between the state’s interests and communities’ interests in education, and social critics on the practice of civic education.

5 units (Reich) given 2001-02

159R. Ethics and Politics in Public Service—Provides the basis for a connection between an undergraduate’s service activities and his or her academic experiences at Stanford; especially for freshmen and sophomores who participate (or intend to participate) in service activities through the Haas Center or enroll in courses with service learning components. What does it mean to “do” public service? Why should or should not citizens do volunteer work? Is public service by definition a good thing? The history, hazards, responsibilities, and dilemmas of doing public service. A historical context of public service work in the U.S., introducing the range of ethical concerns involved with service.

5 units, Win (Reich)

161S. Seminar: Democratic Theory—The major questions in modern democratic theory, including obedience to authority, alienation, participatory democracy, and political tolerance.

5 units, Spr (Sniderman)

162. Seminar: Capitalism and Democracy—The attacks on, and defense, of the workings of the American political economy, emphasizing competing theories of democracy.

5 units, Win (Manley)

163H. Seminar: Constitutionalism—Theories of constitutionalism and why constitutions fail or succeed in various contexts. The history of the U.S. constitution and contemporary constitutional experiences. Constitutionalism is related to political philosophical arguments about social order and its sources.

5 units, Aut (Hardin)

167. Seminar: Gender, Development, and Women’s Human Rights in International Perspective—(Same as 267.) The intersections of gender and development theory and practice. The evolution of development theory from modernization to neoliberal, and the parallel growth of feminist critiques. The effects of specific economic, social, educational, and environmental development policies on women, and women’s activism around these policies at the national and international levels. Examples from the developing regions: Asia, Africa, Latin America, and the Middle East. GER:4c (DR:1)

5 units (Okin) not given 2000-01

169. Directed Reading/Research in Political Theory—Advanced individual study in political theory.

any quarter (Staff)

AMERICAN POLITICS

170. Judicial Politics and Constitutional Law: The Federal System—The interaction of law and politics, and the role of the U.S. Supreme Court in constitutional interpretation and the political system generally. Focus is on major court cases dealing with separation of powers and federalism. Prerequisites: 10 or equivalent, and sophomore standing.

5 units (Staff) not given 2000-01

171. Judicial Politics and Constitutional Law: Civil Liberties—The role and participation of courts, primarily the U.S. Supreme Court, in public policy making and the political system. Judicial activity in civil liberty areas (religious liberty, free expression, race and sex discrimination, political participation, and rights of persons accused of crime). Prerequisites: 10 or equivalent, and sophomore standing.

5 units (Staff) not given 2000-01

172J. Undergraduate Colloquium: Thomas Jefferson and His World—(Enroll in History 250C.)

5 units (Rakove) not given 2000-01

172R. Undergraduate Colloquium: Constitutional Interpretation in History and Theory—(Enroll in History 250B.)

5 units, Win (Rakove)

173M. Critical Overview of American Political History—Critics and defenders of American “democratic capitalism,” from colonial times to present. Prerequisite: 10 or consent of instructor.

5 units, Spr (Manley)

174M. Seminar: The American Dream—Open to juniors and seniors. The American dream in American history. Weekly meetings discuss readings and individual research projects. Prerequisite: 60, or consent of instructor.

5 units, Spr (Manley)

175B. Seminar: Judicial Biography in the Study of Law and Courts—The Life and Times of Justice Thurgood Marshall—Overview of the use of judicial biography in understanding the nature and functions of courts and law in American politics and society, with an intensive study of the life and times of Justice Thurgood Marshall. Prerequisite: advanced undergraduate or graduate standing with two or three courses in law, or law-related courses, and/or consent of instructor.

5 units (Barker) not given 2000-01

176. Seminar: The Supreme Court—Intensive study of the U.S. Supreme Court and its role in the governing system. Topics: the court as a political-legal institution, judicial recruitment and selection, the nature and dynamics of judicial decision-making in individual and collegial contexts, and the differential role and responsiveness of the court as compared to other governing institutions. Prerequisites: 170 or 171, and junior standing, or consent of instructor.

5 units, Aut (Barker)

177. Seminar: Courts, Politics, and Public Policy—The role and interaction of courts with other political institutions and interests in the formulation and implementation of public policy. Prerequisites: 170 or
171. and junior standing, or consent of instructor.
5 units (Staff) not given 2000-01

178. Environmental Policy and Law—(Enroll in Human Biology 125.)
5 units, Spr (Rosencranz)

178R. Natural Resources Policy and Law—(Enroll in Human Biology 131.)
5 units, Win (Rosencranz)

179D. Campaign 2000—The various themes and issues surrounding the 2000 presidential and congressional elections. Each week, a guest lecturer with real on-the-ground campaign experience fleshes out one or more of these themes.
2 units, Aut (Braudy)

179G. Black Politics in the Post-Civil Rights Era—The shift among Black Americans from protest to politics. Emphasis is on the development and use of political resources as the means to achieve policy objectives. Topics: black political attitudes and political participation, voting rights and representation, party politics, multi-racial coalition building. Original data analysis using recent public opinion surveys of the black electorate.
5 units, Win (Gay)

180. Seminar: Courts, Color, and the Constitution—A political-legal analysis of the role of the judiciary, especially the U.S. Supreme Court, in dealing with matters relating to race. Focus is on the development and application of jurisprudential doctrines in historical and contemporary perspective; and how legal concepts have influenced public policy and public discourse on race. Prerequisites: 10 or consent of instructor, sophomore standing and some relevant background social science course.
5 units, Aut (Barker)

180R. Global Environment Policy and Law—(Enroll in International Relations 134.)
5 units, Aut (Rosencranz)

181R. South Asia: Environment, Development, and Security—(Enroll in Anthropological Sciences 165.)
5 units, Spr (Rosencranz)

182F. Introduction to American Law—(Same as American Studies 179, Law 106.) American law for undergraduates. The structure of the American legal system, including the courts; American legal culture; the legal profession and its social role, the scope and reach of the legal system, the background and impact of legal regulation, the relationship between the American legal system and American society in general. Prerequisite: 10 or consent of instructor. GER:3b (DR:9)
5 units, Aut (Friedman)

184W. Issues of Representation in American Politics—How the mass citizenry and organized interests are represented in American politics and the policy making process. Focus is on problems of representations in controversies over social and economic policies that evoke economic and ethic cleavages in society. Problems of minority representation, including a comparison of the issues confronting Asian American, Chicano/a, Native American, and African American groups. Prerequisite: 10 or consent of instructor. GER:3b (DR:9)
5 units, Win (Wong)

5 units, Spr (Wong)

186. Urban Politics—Introduces the major actors, institutions, processes, and policies of sub-state government in the U.S., focusing primarily on city general-purpose governments through a comparative examination of historical and contemporary politics. The issues related to federalism, representation, voting, race, poverty, housing, and finances. Prerequisite: 10 or consent of instructor. GER:3b (DR:9)
5 units, Aut (Fraga)

187. Introduction to the Politics of Educational Analysis—(Enroll in Education 220B.)
4 units, Spr (Kirst)

188I. Analysis of Presidential Campaigns—(Enroll in Communication 162/262.)
5 units, Aut (Iyengar)

192F. Seminar: Politics of Race and Ethnicity in the United States—Examines the historical and contemporary politics of selected communities of color to comprehensively understand American political development and important issues in current American politics. Topics: educational opportunity, vote dilution, and immigration.
5 units (Fraga) not given 2000-01

193. Politics by the Numbers—Analysis of the uses of statistics in political argument and in political science. Elementary statistical concepts (e.g., research design, sampling, correlation, inference, and threats to validity). The "political" uses of statistics in settings such as polling data in political campaigns, and in evaluating public policy (e.g., education, welfare, the environment). Research and analysis paper. Prerequisite: 10 or consent of instructor.
5 units (Jackman) not given 2000-01

194C. The Press and the Political Process—(Enroll in Communication 160.)
5 units, Spr (Iyengar)

196. Issues of Race in American Politics—Surveys the forms that racism takes in contemporary American political thinking, emphasizing the connections, if any, between central values in the American political tradition (e.g., self-reliance and individualism, attitudes toward Blacks, and ideas about racial policies). Recent, large-scale surveys of the opinions and attitudes of Americans. Prerequisite: 10 or consent of instructor.
5 units (Sniderman) not given 2000-01

197P. Seminar: Political Beliefs and Values of Black Americans—An examination, based on original analysis and research, of the view of African Americans on current issues and controversies.
5 units, Win (Sniderman)

197S. Seminar: Prejudice and Group Conflict—An opportunity to engage in original data analysis on problems of significant social and political interest. Focus is on the analysis of prejudice, e.g., the views of white Americans toward Black Americans and Blacks toward white Americans.
5 units (Sniderman) not given 2000-01

198. Directed Reading/Research in American Politics—Advanced individual study in politics. Prerequisite: 10 or equivalent.
any quarter (Staff)

199A, B, C. Senior Project—Students conduct independent research work towards a senior honors thesis. See "Honors Program" above.
any quarter (Staff)

199R. Seminar: Senior Research Project—Required for students writing honors theses. Focus is on acquisition of research skills and development of an appropriate research design. (WIM)
3 units, Aut (Abernethy)
GRADUATE-UNDERGRADUATE SEMINARS

Conducted as seminars or colloquia, and open to advanced undergraduates and graduates. Non-majors and majors are usually welcome, but enrollments are limited. Sign-up sheets for these courses are posted in the department office on class list sign-up days. Sheets should be checked for specific enrollment information.

GENERAL

200A. Statistical Methods I—For graduate students; see 100A.
5 units, Aut (Fearon)

200B. Statistical Methods II—For graduate students; see 100B.
5 units, Win (Staff)

200C. Statistical Methods III—For graduate students; see 100C.
5 units (Jackman) not given 2000-01

201A. Seminar: Foundations of Political Economy—(Same as Business 680.) First in a three-part sequence and a prerequisite for the remaining courses. Political economy is the study of collective decision-making and the institutions used to make and implement those decisions. The central issues and techniques in the political economy, laying a foundation for original research using methods of positive political science. Topics: social choice, majority rule, strategic behavior, agendas, institutions, interest groups, and lobbying. Material is somewhat technical but accessible to most graduate students in political science, economics, and business.
5 units, Aut (Groseclose)

201B. Seminar: Economic Analysis of Political Institutions—(Same as Business P681.) Continuation of 201A, applying the techniques of microeconomic analysis and game theory to the study of political behavior and institutions, including information economics, games of incomplete information, sequential bargaining theory, repeated games, and rational expectations. Applications include agenda formation in legislatures, the implications of legislative structure, government formation, lobbying, electoral competition and interest groups, the control of bureaucracies, interest group competition, and collective choice rules.
5 units, Win (Baron)

201C. Seminar: Applied Formal Models—Congressional Decision-Making—(Same as Business 682.) Focus is on empirical applications of formal models to the study of legislatures. Objective: to learn how such skills can be applied to obtain a more comprehensive and systematic understanding of collective decision-making. Prerequisites: 201A,B, or equivalent technical skills.
5 units, Spr (Krehbiel)

202. Graduate Seminar: Introduction to Game Theoretic Methods in Political Science—Primarily for graduate students; undergraduates admitted with consent of the instructor. The basic concepts and tools of non-cooperative game theory as developed in the last 15 years by economists, using primarily political science examples to illustrate their application. How modern game theory works. Problems that might be usefully examined with these methods. The intuition and substance behind the formalizations. A methods rather than a survey of applications or philosophy-of-the-approach.
5 units, Win (Fearon)

203. Topics in Statistical Modeling—Possible topics: multivariate analysis, multidimensional scaling, ideal point estimation, duration models, generalized linear models, trends and non-stationarity, causality testing, nonparametric and robust methods, bootstrapping. Bayesian methods, statistical computing.
5 units (Jackman, Rivers) not given 2000-01

POLITICAL ORGANIZATIONS

206. Seminar: Politics and Organization—Provides an analytical foundation for understanding organized activity as it reflects the organization of political life. Coverage of theories is eclectic and interdisciplinary. Emphasis is on political institutions and formal organizations generally, and the norms, expectation, and routines characteristic of informal political structure.
5 units, Win (Moe)

206W. Seminar: New Economics of Organization—Survey of economic approaches to organization, emphasizing theory and application, with attention to politics.
5 units, Spr (Weingast)

207. Seminar: Organizational Decision-Making—Behavioral theories of organization. Emphasis is on the institutional implications of bounded rationality. Models of incrementalism; evolutionary models of change; organizational learning. The differences between predictions of theories of perfect rationality and those of imperfect rationality. Organizational responses (constructive and pathological) to constraints on information-processing. Institutional contexts: public agencies and firms.
5 units, Spr (Bendor)

207A. Topics in Organizational Adaptation—(Enroll in Education 378X.)
2-5 units (March) not given 2000-01

209. Directed Reading in Public Administration
any quarter (Staff)

COMPARATIVE POLITICS

210. Seminar: Political Culture—Culture that emphasizes its equilibrium attributes. This entails working through the relationship of culture, choice, coordination, and common knowledge. The implications of this approach to culture for the study of political processes and institutions. Paper combines theories of culture with evidence about its purported implications.
5 units, Spr (Laitin)

211M. Seminar: Comparative Party Politics and Elections—Critical theoretical and empirical research on party politics and voting behavior. The determinants of individual voting behavior, the internal dynamics of parties, and the way they shape the operation of government in different institutional settings, e.g., parliamentary and presidential systems. The institutional constraints in which parties operate and how electoral rules and social cleavages shape party systems. Why people vote, whether voters choose parties rationally to represent their points of views, and in which way government performance shapes voting choices. Why politicians seek to further their goals and ambitions through the party, the strategies they follow to mobilize electoral support, and in what way partisan government shapes economic performance and peoples’ welfare. Research and models are developed from advanced industrial democracies to understand party politics in new democracies.
5 units (Magaloni) not given 2000-01

212M. Seminar: Comparative Political Institutions—Overview of the range of existing political institutions and their impact on political-economic outcomes. The roles of political institutions and what determines their stability, how they are chosen, and which processes enable their transformation over time. The main variances in institutional settings, emphasizing the menu of democratic institutions, e.g., parliamentary, semi-presidential, and presidential systems; electoral rules; bicameralism; federalism; and legislative-executive relations. The effect of political institutions on economic growth and political stability.
5 units (Magaloni) not given 2000-01

213P. Seminar: Economic Reform and Development in Latin America—Theoretical and policy approaches to Latin American development
in recent decades, with an emphasis on issues raised, and positive and normative theories in use since the economic crises of the 1980s. Prerequisite: consent of instructor.
5 units, Spr (Packenham)

214M. Seminar: Chinese Communist Revolution—(Enroll in Sociology 217B.)
5 units (Walder) given 2001-02

215A. China under Mao—(Enroll in Sociology 217A; same as 115A.)
5 units, Aut (Walder)

215B. Chinese Politics: The Transformation and the Era of Reform—(Same as 115B.)
5 units, Win (Oi)

215D. Graduate Seminar: Approaches to Chinese Politics—Provides bibliographic control of the major secondary literature on Chinese politics, organized around theoretical concepts and issues found in studies of the Chinese political system. Prerequisite: basic knowledge of the government and politics of post-1949 China.
5 units, Win (Oi)

215E. Graduate Seminar: Political Economy of Reform in China—The content, process, and problems of China’s post-Mao reforms. Changes in property rights, markets, credit, and the role of the state in economic development. Comparative insights about reform in the Chinese communist system that distinguishes it from the experience of regimes in Eastern Europe and the former Soviet Union. Readings in Chinese and English. Prerequisite: basic knowledge of the government and politics of post-1949 China.
5 units, Spr (Oi)

216L. Comparative Democratic Development—For graduate students; see 116L.
5 units, Win (Diamond) given 2001-02

216M. Seminar: Environmental Politics in the Asia/Pacific Region—Focus is on the evolving ecology of Asia/Pacific from 1400 to the present (topography, climate, flora and fauna, and human populations); traditional patterns of managing and perceiving environmental issues; recent environmental consequences of industrialization and modern agriculture (problems in water, air, and soil quality; land use; and coastal water quality); contemporary policies of Asian countries concerning their environmental problems (improved water management and effluent discharge standards, soil conservation, auto emission controls, national energy policies, transportation policies, and policies on population growth and migration); and bureaucracies, interest groups, transitional actors, and the environmental politics of Asian/Pacific countries. Emphasis is on Japan, China, Indonesia, Thailand, India, and the small Pacific island nations. Policy making and implementation processes in the environmental area: the structures and institutions established in recent years; their efficacy; and the political, economic, and cultural obstacles and inducements to implementing environmental policies. Prerequisite: consent of instructor.
5 units (Oksenberg) not given 2000-01

217. Seminar: Russia in Transition
5 units, Win (McFaul)

5 units, Win (Oksenberg, Miller)

217L. Seminar: Ethnicity and Nationalism in Soviet and Post-Soviet Politics—The major theoretical approaches to the study of ethnicity and nationalism in the Soviet system and how they attempt to explain the strategies and institutions utilized by the Soviet state to manage its “nationality problem;” the impact of Gorbachev’s reforms in precipitating national movements which contributed to the dissolution of the Soviet system; and the role of ethnicity and nationalism in the new states of the region.
5 units (Lapidus) not given 2000-01

219A. Seminar: European Integration—(Same as Public Policy 205, International Policy Studies 206.) Seminar on the political and economic factors shaping European integration from its conception to the present day. The evolution of the European Union and its governing institutions through the lens of several policy areas. Agricultural, regional, monetary, regulatory, and foreign policy. The debates about democratic accountability, the future of the European Union, and the interplay between EU institutions and the domestic political arenas of member states. Prerequisites: Economics 1, Political Science 1 or 10.
5 units, Win (Aller)

220W. Graduate Seminar: Politics, Economic Policy and Economic Performance in Advanced Industrial Democracies—Critical evaluation of key theoretical approaches to the understanding of fundamental differences in economic policy and performance across the advanced industrial democracies. What is the relative importance of government partisan and ideology, social cleavages, and institutional structures in explaining patterns in economic policy and outcomes? How do these “political” models compare with models emphasizing economic variables such as capital market integration, trade openness, or technological change? 5 units, Spr (Wren)

221K. Seminar: Comparative Democratization—Latin America and Other Regions—Critical issues of democracy, its definition, problems of transition and consolidation, and comparison. The relationship between democracy and the military, the economy, and the interstate system.
5 units, Win (Karl)

223. Seminar: Japanese Politics—The primary institutions in Japanese politics (the bureaucracy, legislature, political parties, and interest groups) through the lens of the major theories that have been used to explain their structure and behavior (statism, pluralism, elitism, and network theory).
5 units (Okimoto) not given 2000-01

223M. Seminar: Political Economy of Post-Communism—The sources of the collapse of the communist states in Eastern Europe and the former Soviet Union. Issues facing the formation and consolidation of post-communist states and societies, including democratization, privatization, nationalism, and foreign relations between newly independent states. Models and historical analogues for analyzing the emergence of post-communist politics. Prerequisite: 121M.
5 units, Spr (McFaul)

224. Seminar: States and Markets in Development—Research-oriented, focusing on recent trends in most of the world toward market-oriented policies and models of national development: what has happened, why, what it means and how to evaluate it. Prerequisite: consent of the instructor.
5 units (Packenham) not given 2000-01

225. The Rise of Industrial Asia—See 125. Limited to graduate students.
5 units, Aut (Oi, Okimoto, Oksenberg, Rohlen, Rowen)

226. Seminar: The Politics of Welfare State Expansion and Reform—Critical evaluation of the main theories explaining the development of the welfare state and its impact on the organization of the political economy. The relative importance of institutional variables, social cleavages, partisanship, and ideology, and the role of economic openness in explaining cross-national differences in social policy. The recent politics of social policy adjustment, and the extent existing differences...
among welfare states endure in the face of unfavorable economic and demographic developments and common political pressures towards welfare state retrenchment.

5 units, Win (Mares)

227D. Seminar: Consolidating Democracy—Problems and processes in consolidating new or recently restored democracies. Examples and illustrations from Europe, Asia, Africa, and Latin America, with emphasis on the new democracies of the post-1974 "third wave" period. The nature of consolidation and its relationship to legitimation; legacies of authoritarian rule and the transition; design of political institutions; (re)building political parties; crafting agendas and constructing coalitions; problems of democratic governance (delivering accountability, a rule of law, electoral integrity); the relationship between consolidation and structural economic reform, managing ethnic and regional conflict; establishing civilian control over the military; developing a democratic civil society and political culture; and the role of international actors. Research paper on an individual country.

5 units, Win (Mares)

227D. Seminar: Consolidating Democracy—Problems and processes in consolidating new or recently restored democracies. Examples and illustrations from Europe, Asia, Africa, and Latin America, with emphasis on the new democracies of the post-1974 "third wave" period. The nature of consolidation and its relationship to legitimation; legacies of authoritarian rule and the transition; design of political institutions; (re)building political parties; crafting agendas and constructing coalitions; problems of democratic governance (delivering accountability, a rule of law, electoral integrity); the relationship between consolidation and structural economic reform, managing ethnic and regional conflict; establishing civilian control over the military; developing a democratic civil society and political culture; and the role of international actors. Research paper on an individual country.

5 units, Win (Mares)

228D. Seminar: Non-Governmental Organizations and Development in Poor Countries—How might non-governmental organizations affect economic growth, equity, political stability, and prospects for democracy in poor countries? Do NGOs actually contribute to these goals? What is reasonable and appropriate to expect from the NGO sector? Interactions among NGOs from wealthy countries; NGOs based in poor countries, governments, international financial institutions, and multinational corporations.

5 units (Abemethy) given 2001-02

229. Directed Reading in Comparative Politics any quarter (Staff)

INTERNATIONAL RELATIONS

234P. Technology in National Security—(Enroll in Management Science and Engineering 193; same as 134P.)
3 units, Aut (Perry)

233S. Seminar: Security in South Asia after the Cold War—The historical and current security problems of India and Pakistan. Topics: internal security concerns, Cold War relationships, nuclear weapons policies, arms control, and military doctrines.
5 units, Spr (Cheema)

5 units (Stiedman) given 2001-02

239. Game Theory Applications in Political Science—Game theory applications in international relations, legislative decision-making, the development of institutions, etc. The philosophy and the mechanics of game models. Goal: the ability to read critically articles using the approach, and to promote student skill in formulating such models themselves. Recommended: prior course in game theory.
5 units (Staff) not given 2000-01

240M. Chinese Foreign Policy—For graduate students only; see 140M.
5 units (Oksenberg) not given 2000-01

241. Seminar: Issues in International Political Economy—Open to master's students and to advanced undergraduates. Critical examination of the major contemporary issues of global economic relations.
5 units, Win (Goldstein)

241B. Seminar: Decision Making in U.S. Foreign Policy—(Enroll in International Policy Studies 241B.)
5 units, Spr (Blacker)

242F. Graduate Seminar: The Politics of Ethnicity—Why do political coalitions form along ethnic lines in some places and at some times but not others? Why do conflictual but peaceful interethnic relations become violent at some times and in some places but not others?
5 units (Fearon) not given 2000-01

243A. Graduate Seminar: International Relations Theory—Introduction to contemporary theories of international politics. Micro and macro approaches to the study of conflict and cooperation in world politics, including the work of Carr, Waltz, Gilpin, Keohane, and Bueno de Mesquita. Format emphasizes student oral and written presentations of assigned readings.
5 units, Aut (Fearon)

243B. Seminar: Theoretical Issues in International Security—Critical examination of the major theories concerned with international security. The theories are reviewed at a variety of levels of analysis (systemic, domestic politics, organizational, and psychological). Short research design papers and a longer literature review essay.
5 units, Win (Sagan)

243C. Seminar: Theoretical Issues in International Political Economy—For Ph.D. students only. Major contemporary theories affecting global economic relations and related national policies.
5 units, Spr (Goldstein)

244. Graduate Seminar: International Monetary and Financial Relations—the political aspects of international monetary and financial relations. The role of government in setting exchange rates and regulating the movement of international capital. The enforcement of international financial contracts, including loans to sovereign governments and direct investments in foreign countries. The political origins and consequences of cross-border financial crises.
5 units, Spr (Tomz)

5 units, Spr (Rice)

5 units, Spr (Lewis)

249. Directed Reading in International Relations any quarter (Staff)

POLITICAL THEORY

Graduate students in Political Theory should also see courses numbered 150-169.

251A. History of Political Thought I: Ancient, Classical, and Christian Worlds—For graduate students; see 151A.
5 units, Win (Connolly)

251B. History of Political Thought II: The Origins of Modern Democracy—For graduate students; see 151B.
5 units, Aut (Jacobson)
Recent philosophical works on multiculturalism, with attention to mul-
cultural education: What is multiculturalism? How does it differ from
education? Readings from Charles Taylor, Will Kymlicka, Amy Gut-
ness of inequality between the sexes. The ways in which assumptions about
sexual difference have shaped the essential concepts of our tradition,
including reason, nature, politics, justice, and the separation of public
from private life. The different and sometimes contrasting interpreta-
tions of the primary works read. Enrollment limited. Prerequisite: a
course in political theory. GER:4c (DR:1)
5 units (Okin) not given 2000-01

267. Seminar: Gender, Development, and Women's Human Rights
in International Perspective—(Same as 167.)
5 units (Okin) not given 2000-01

268. Seminar: Contemporary Theories of Justice—Social and polit-
cal justice. Facilitates an understanding of the major contemporary
debates in political theory. The major recent works that develop the
principles of justice, and the political arrangements that best satisfy their
requirements. Enrollment limited. (WIM)
5 units, Spr (Reich)

269. Directed Reading in Political Theory
any quarter (Staff)

AMERICAN POLITICS
272R. Graduate Colloquium: Creating the American Republic—
(Enroll in History 372.)
4-5 units (Rakove) not given 2000-01

279D. Seminar: Election 2000—The various themes and issues sur-
rounding the 2000 presidential and congressional elections. Each week,
a guest lecturer with real campaign experience fleshes out a variety of
campaign and/or political themes. The elections (and lectures) are placed
into a broader framework for understanding the relationship between
candidates, voters, and elections. Papers, project. Enrollment limited.
5 units, Aut (Brady)

281P. Graduate Seminar: Introduction to Political Psychology—For
second-year graduate students and beyond. Current issues in the study of
public opinion and political psychology, introducing the design and
analysis of experiments embedded in survey research. Focus is on
reviewing the research literature one week, then analyzing relevant data
sets the next.
5 units, Spr (Sniderman)

289M. Seminar: The Presidency—A wide-ranging exploration of the
American presidency, including: the history of the office, constitutional
and statutory powers, electoral politics, relations with Congress and
pursuit of legislation, the rise of the institutional presidency, manage-
ment and control of the bureaucracy, leadership in foreign policy and
war, formulation of the domestic agenda, appointments to the courts, etc.
5 units, Spr (Moe)

290F. Seminar: Politics of the Administrative State—Recent research
on congressional, judicial, and administrative politics in the modern
administrative state. Empirical applications to the U.S. with some focus
on European. Modeling political behavior in complex institutional
settings.
5 units, Win (Ferejohn, Fiorina)

291F. Seminar: Urban Politics and Policy—Graduate and undergrad-
uate. The major theoretical approaches used in the analysis of urban
politics and policy. Assesses the fundamental conclusions about Amer-
ican politics reached by urban scholars and how subsequent interpreta-
tions continue to set the context for much scholarly debate about
American political development generally.
5 units (Fraga) not given 2000-01

291J. Seminar: The Politics of the American Macro-Economy—
(Same as 191J.)
5 units (Jackman) not given 2000-01
292A. Graduate Seminar: Approaches to the Study of American Politics—Theories of American politics, focusing on Congress, the presidency, the bureaucracy, and the courts.
   5 units, Aut (Fiorina)

292B. Graduate Seminar: Topics in American Political Behavior—For graduate students with some background in American politics and behavior, leading to the completion of a significant scholarly paper. Corequisites: 292A,B.
   5 units, Aut (Gay, Sniderman)

292C. Graduate Seminar: American Political Institutions—Students undertake supervised research in American politics and political behavior, producing a research proposal, and conducting research leading to the completion of a significant scholarly paper. Prerequisites: 292A,B,C.
   5 units, Win (Gay, Sniderman)

292D. Research and Writing—Students undertake supervised research in American politics and behavior, leading to the completion of a significant scholarly paper. Corequisites: 292A,B,C.
   5 units, Aut (Iyengar, Wong)

293. Graduate Seminar: Models of Political Choice—Recent research on political reasoning in mass publics. The nature of ideology, the role of political values, the framing of political issues, informational constraints, and alternative conceptions of the process of political choice.
   5 units (Sniderman) not given 2000-01

294. Graduate Seminar: Politics of Social Policy and Race—The politics of social policy-making in the U.S. Topics: partisan conflict over social policy; the role of budgeting in the making of welfare policy, interest group influence and the nature of public opinion. Focus is on the relationship between the politics of race and welfare policy. Social policy issues include welfare policy, health care, affirmative action, and language policy.
   5 units, Spr (Wong)

294C. The Press and the Political Process—(Enroll in Communication 260.)
   4 units, Spr (Iyengar)

296. Seminar: Racial and Ethnic Politics in the U.S.—Focus is on the evolution of racial and ethnic politics in the U.S., examining the political development of the American polity generally. Goal: the construction of a comprehensive theory of American political development which can incorporate race and ethnicity.
   5 units (Fraga) given 2001-02

297. Graduate Seminar: The Political Economy of Immigration—The theoretical and empirical literature on migration politics and the economic causes and effects of migration. The political economy of American immigration in comparative perspective. The immigration dilemmas of governments in Western Europe, Asia, and Australia.
   5 units (Wong) not given 2000-01

298. Directed Reading in American Politics
   any quarter (Staff)

GRADUATE SEMINARS

Seminars numbered 300 and above are limited to graduate students. Instructors should be consulted before enrolling.

300. Thesis
   any quarter (Staff)

311. Graduate Seminar: Major Theories in Comparative Politics—Required for all Political Science Ph.D. students with comparative politics as a first or second concentration; others by consent of instructor. The major theoretical approaches in comparative politics including modernization, institutionalist, class, rational choice, cultural, and new institutionalist theories; also theories about major regime types (democracy, authoritarianism, totalitarianism) and transitions between them. Enrollment limited to 14.
   5 units, Aut (Packenham)

312. Seminar: Comparative Political Analysis—For Political Science Ph.D. candidates. Required of all students with comparative politics as a first or second concentration. Qualified Ph.D. candidates in other departments and A.M. candidates in Political Science may be admitted with consent of the instructors. Enrollment limited.
   5 units, Win (Laitin)

313. Workshop in Comparative Politics and Historical Analysis
   5 units, Aut, Win, Spr (Laitin)

313H. Graduate Seminar: Historical Approaches to Social Science—(Enroll in History 482.)
   4-5 units (Haber) not given 2000-01

314K. Seminar: Political Economy of Development—The major development theories in the area of comparative politics, emphasizing the interplay between global and domestic factors, and economics and politics in the developing world.
   5 units (Karl) not given 2000-01

315F. Graduate Seminar: Topics in Chinese Politics—In depth examination of selected topics in Chinese politics. Content varies each year.
   5 units (Oi) not given 2000-01

315K. Research in Latin America and Other Regions
   5 units, Spr (Karl)

315O. Graduate Seminar: Methods for Social Science Research in China—For doctoral students. A hands-on examination of the major methods used for social science research in contemporary China. Strategies for fieldwork, interviewing, surveys, documents, and general archival work in primary sources.
   2 units, Win (Oi, Olzenberg, Walder)

340. Seminar: New Approaches to International Security—Live televised seminar between Stanford and the universities of Minnesota and Wisconsin. Innovative interdisciplinary approaches to security from the political science, sociology, anthropology, history, and engineering perspectives. Issues relating to war, nationalism, ethnic conflict, conflict resolution, democratization, and sustainable development. Approaches and issues are related to changing understandings of international security and conflicting disciplinary assumptions and methodologies.
   5 units, Aut (Eden, O'Neill)

343A,B,C. Research Seminar: International Security and Social Science—Advanced graduate students, faculty, and visitors present current research on contemporary problems in international security.
   1 unit, Aut, Win, Spr (Eden, Sagan)

380A. Workshop on Political Economy
   5 units, Aut (Weingast)

380B,C. Workshop on Political Economy
   5 units, Win, Spr (Ferejohn)

401. Seminar: Graduate Orientation—Open to first-year graduate students in Political Science.
   1 unit, Aut (Staff)
OVERSEAS STUDIES
Courses approved for the Political Science major and taught overseas can be found in the "Overseas Studies" section of this bulletin, or in the Overseas Studies office, 126 Sweet Hall.

MORRISON INSTITUTE FOR POPULATION AND RESOURCE STUDIES
Faculty: (Director) Marcus W. Feldman (Biological Sciences); Carl Djerassi (Chemistry), William Durham (Anthropological Sciences), Paul R. Ehrlich (Biological Sciences), Lawrence H. Goulder (Economics, Institute for International Studies), Mary Lake Polan (Gynecology and Obstetrics)
Consulting Professor: Shripad Tuljapurkar

Although Stanford University does not have a formal degree program in population studies, it does have scholars of international reputation in such specialties as demographic history, demographic methods, economic demography, epidemiology, population biology, population genetics, and the sociology and anthropology of populations.

The Morrison Institute for Population and Resource Studies is an interdisciplinary group serving three major functions: (1) encouraging graduate work in population studies through fellowship grants and supervision, (2) instituting courses and seminars in population studies, and (3) bringing visiting faculty to Stanford to strengthen existing course offerings. The institute also organizes an interdisciplinary Colloquium on Population Studies to introduce upper-division undergraduates and graduate students to a variety of issues in population-related specialties.

For the convenience of interested students, offerings of population and resource studies at Stanford are listed below.

COURSES

ANTHROPOLOGICAL SCIENCES

7. Marriage and Kinship
5 units, Win (Wolf)

8. Introduction to Anthropological Genetics
5 units, Win (Mountain)

9. Human Environments and Adaptations
3-5 units (Staff) not given 2000-01

112. Human Diversity: A Linguistic Perspective—(Same as Human Biology 118.)
3 units, Spr (Ruhlen)

124. Perspectives on Sustainable Development in Latin America
5 units, Win (Rosset)

150. Population and Society
5 units (Wolf) not given 2000-01

151. Demography in Anthropology
5 units (Staff) not given 2000-01

153. The Population Question: From Malthus to Rio
3-5 units (Durham) not given 2000-01

154. The Limits to Growth
3-5 units (Staff) not given 2000-01

160. Development and Environment
5 units (Staff) not given 2000-01

161A. Conservation and Development Issues in the Amazon—(Same as Human Biology 136.)
5 units, Win (Stronza, Durham)

161B. Human Ecology of the Amazon
5 units (Lu) not given 2000-01

162. Indigenous Peoples and Environmental Problems
3-5 units (Durham) not given 2000-01

163. Community-Based Conservation
5 units (Staff) not given 2000-01

164. Ecological Anthropology—(Same as Human Biology 134.)
5 units (Durham) not given 2000-01

165. South Asia: Environment, Development, and Security
5 units, Spr (Rosencranz)

166B/266B. Fishing for Solutions: Issues in Marine Conservation
3-5 units, Win (Novy)

168A. Ecology and Equity
5 units, not given 2000-01

168B. Environmental Justice
5 units, Aut (Lu)

170/270. Medical Anthropology
5 units, Aut (Barnett)

204. Culture and Politics in South Asia
5 units (Staff) not given 2000-01

213. Topics in Linguistic Anthropology
5 units, Aut (Fox)

237. Climate and Human Evolution
5 units (Staff) not given 2000-01

250. Advanced Ecological Anthropology
5 units, Win (Durham)

251. Anthropological Solutions to Environmental Problems
5 units (Staff) not given 2000-01

252. Political Ecology
5 units (Durham) not given 2000-01

266. Human Evolutionary Ecology
5 units, Spr (Lu)

BIOLOGICAL SCIENCES

13N. Stanford Introductory Seminar: Environmental Problems and Solutions
3 units, Spr (Ehrlich)

15N. Stanford Introductory Seminar: Environmental Literacy
3 units (Schneider) alternate years, given 2001-02

16N. Stanford Introductory Seminar: Island Ecology
3 units, Win (Vitousek) alternate years, not given 2001-02

43. Physiology, Ecology, and Behavioral Biology
5 units, Spr (Vitousek, Gordon, Heller, Jones, Ray)

117. Biology and Global Change—(Same as Earth Systems 111.)
3 units, Win (Matson, Vitousek, Mooney)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Terms</th>
<th>Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>125</td>
<td>Ecosystems of California</td>
<td>3-4</td>
<td>Spr (Mooney)</td>
<td></td>
</tr>
<tr>
<td>138</td>
<td>Ecology and Evolution of Plants</td>
<td>3-5</td>
<td>Spr (Ackerly)</td>
<td>alternate years, given 2001-02</td>
</tr>
<tr>
<td>140</td>
<td>Population Biology of Butterflies</td>
<td>2-5</td>
<td>Spr (Ehrlich)</td>
<td></td>
</tr>
<tr>
<td>142/242</td>
<td>Principles of Ecology—(Same as Geophysics 142.)</td>
<td>4</td>
<td>Aut (Roughgarden)</td>
<td></td>
</tr>
<tr>
<td>146</td>
<td>Colloquium on Population Studies</td>
<td>1</td>
<td>Win (Feldman)</td>
<td></td>
</tr>
<tr>
<td>147</td>
<td>Controlling Climate Change in the 21st Century—(Same as Human Biology 147.)</td>
<td>3</td>
<td>Aut (Schneider, Rosencranz)</td>
<td></td>
</tr>
<tr>
<td>173H/273H</td>
<td>Marine Conservation Biology</td>
<td>3</td>
<td>B. Block)</td>
<td>alternate years, given 2001-02</td>
</tr>
<tr>
<td>175H</td>
<td>Problems in Marine Ecology and Ecophysiology</td>
<td>8</td>
<td>Spr (Watanabe, Denny, Micheli, Somero, Epel, B. Block)</td>
<td></td>
</tr>
<tr>
<td>194/294</td>
<td>Seminar in Environmental Policy Research</td>
<td>3</td>
<td>Ehrlich)</td>
<td>alternate years, given 2001-02</td>
</tr>
<tr>
<td>216</td>
<td>Ecosystem Ecology and Global Biogeochemistry</td>
<td>3</td>
<td>Spr (Vitousek)</td>
<td>alternate years, not given 2001-02</td>
</tr>
<tr>
<td>217</td>
<td>Climate Theory, Modeling, Applications, and Implications</td>
<td>3</td>
<td>Schneider)</td>
<td>alternate years, given 2001-02</td>
</tr>
<tr>
<td>302,303,304</td>
<td>Current Topics in Ecology and Evolution</td>
<td>1-3</td>
<td>Aut, Win, Spr (Bohannan)</td>
<td></td>
</tr>
<tr>
<td>383</td>
<td>Seminar in Population Genetics</td>
<td>1-3</td>
<td>Aut, Win, Spr (Feldman)</td>
<td></td>
</tr>
<tr>
<td>384</td>
<td>Seminar in Theoretical Ecology—(Same as Geophysics 385Y.)</td>
<td>1-3</td>
<td>Spr (Roughgarden)</td>
<td></td>
</tr>
<tr>
<td>459</td>
<td>Frontiers in Interdisciplinary Biosciences</td>
<td>2</td>
<td>Aut, Win, Spr (S. Block)</td>
<td></td>
</tr>
<tr>
<td>CIVIL AND ENVIRONMENTAL ENGINEERING</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>61Q</td>
<td>Stanford Introductory Dialogue: Big Dams, the City Hall, and the Sierra Club</td>
<td>2</td>
<td>Aut (Kitanidis)</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Air Pollution: From Urban Smog to Global Change</td>
<td>3</td>
<td>Spr (Jacobson)</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Environmental Science and Technology</td>
<td>3</td>
<td>Spr (Luthy)</td>
<td></td>
</tr>
<tr>
<td>99A,B,C</td>
<td>Environmental-Issues Seminar</td>
<td>1</td>
<td>Aut, Win, Spr (Monismith)</td>
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</tr>
<tr>
<td>169</td>
<td>Environmental and Water Studies Design</td>
<td>5</td>
<td>alternate years, given 2001-02</td>
<td></td>
</tr>
<tr>
<td>171</td>
<td>Environmental Planning Methods</td>
<td>3</td>
<td>Win (Ortolano)</td>
<td></td>
</tr>
<tr>
<td>172</td>
<td>Air Quality Management</td>
<td>3</td>
<td>Win (Hildemann)</td>
<td></td>
</tr>
<tr>
<td>173A</td>
<td>Energy Resources</td>
<td>4</td>
<td>Aut (Woodward)</td>
<td></td>
</tr>
<tr>
<td>173B</td>
<td>Seminar: The Coming Energy</td>
<td>3</td>
<td>Woodward)</td>
<td>alternate years, given 2001-02</td>
</tr>
<tr>
<td>265</td>
<td>Sustainable Water Resources Development</td>
<td>3</td>
<td>Win (Ortolano)</td>
<td></td>
</tr>
<tr>
<td>266</td>
<td>Environmental Policy Design and Implementation</td>
<td>4</td>
<td>Ortolano)</td>
<td>given 2001-02</td>
</tr>
<tr>
<td>CULTURAL AND SOCIAL ANTHROPOLOGY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>Environmental Politics and Development</td>
<td>5</td>
<td>Gupta)</td>
<td></td>
</tr>
<tr>
<td>133A,B,C</td>
<td>Ethics of Development in a Global Environment (EDGE)—(Same as Engineering 297A,B,C.)</td>
<td>1-4</td>
<td>Aut, Win, Spr (Lusignan, Gupta)</td>
<td></td>
</tr>
<tr>
<td>EARTH SYSTEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Introduction to Earth Systems</td>
<td>3-5</td>
<td>Win (Ernst)</td>
<td></td>
</tr>
<tr>
<td>101</td>
<td>Energy and the Environment—(Same as Petroleum Engineering 101.)</td>
<td>3</td>
<td>Spr (Kovscek)</td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>Energy Resources—(Same as Civil and Environmental Engineering 173A.)</td>
<td>4</td>
<td>Aut (Woodward)</td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>Biosphere—(Same as Biological Sciences 117.)</td>
<td>3</td>
<td>Win (Matson, Vitousek, Mooney)</td>
<td></td>
</tr>
<tr>
<td>150/240</td>
<td>Seminar in Sustainable Agriculture</td>
<td>1-2</td>
<td>Matson, Naylor, Kennedy)</td>
<td>alternate years, not given 2001-02</td>
</tr>
<tr>
<td>170/270</td>
<td>Multidisciplinary Perspectives on Environmental Justice</td>
<td>2-3</td>
<td>Thompson)</td>
<td>not given 2000-01</td>
</tr>
<tr>
<td>ECONOMICS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>99Q</td>
<td>Stanford Introductory Seminar: State, Market, and Development</td>
<td>5</td>
<td>Aut (Meier)</td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>The World Food Economy</td>
<td>5</td>
<td>Falcon, Naylor</td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>The Economics of Development</td>
<td>5</td>
<td>Aut (Chun)</td>
<td></td>
</tr>
<tr>
<td>121</td>
<td>Development Economics, with Special Reference to East Asia</td>
<td>5</td>
<td>Spr (Lau)</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>Environmental Economics and Policy—(Same as Earth Systems 112.)</td>
<td>5</td>
<td>Spr (Goulder)</td>
<td></td>
</tr>
<tr>
<td>165</td>
<td>International Economics</td>
<td>5</td>
<td>Kumhof)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Razin)</td>
<td></td>
</tr>
<tr>
<td>214</td>
<td>Microeconomic Issues in Economic Development</td>
<td>5</td>
<td>Win (A. Krueger)</td>
<td></td>
</tr>
<tr>
<td>243</td>
<td>Economics of the Environment</td>
<td>5</td>
<td>Aut (Goulder)</td>
<td></td>
</tr>
</tbody>
</table>

541
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Term(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>248</td>
<td>Health, Medical Care, and Aging</td>
<td>5</td>
<td>not given 2000-01</td>
</tr>
<tr>
<td>44N</td>
<td>Stanford Introductory Seminar: Emerging Issues in Global Environmental Change</td>
<td>3</td>
<td>Matson alternate years, given 2001-02</td>
</tr>
<tr>
<td>45N</td>
<td>Stanford Introductory Seminar: Environment Quality, Is It Getting Better or Worse?</td>
<td>3</td>
<td>Switzer alternate years, not given 2001-02</td>
</tr>
<tr>
<td>133</td>
<td>Introduction to Assessment of Environmental Risk</td>
<td>3</td>
<td>Bernknopf</td>
</tr>
<tr>
<td>160</td>
<td>Introduction to Statistical Methods for Earth and Environmental Sciences</td>
<td>4</td>
<td>Switzer</td>
</tr>
<tr>
<td>170</td>
<td>Environmental Geochemistry</td>
<td>4</td>
<td>Brown</td>
</tr>
<tr>
<td>223</td>
<td>Seminar in Sustainable Agriculture</td>
<td>2-3</td>
<td>Matson, Naylor alternate years, given 2001-02</td>
</tr>
<tr>
<td>257</td>
<td>Climate Variability and Forcing Mechanisms of the last 10,000 Years: Implications for Life in the 21st Century</td>
<td>3</td>
<td>Dunbar alternate years, given 2001-02</td>
</tr>
<tr>
<td>89Q</td>
<td>Stanford Introductory Seminar: Cross-Cultural Issues in Medicine</td>
<td>3</td>
<td>I. Corso</td>
</tr>
<tr>
<td>229</td>
<td>Occupational and Environmental Epidemiology</td>
<td>3</td>
<td>Switzer</td>
</tr>
<tr>
<td>65</td>
<td>Introduction to Comparative Studies in Race and Ethnicity</td>
<td>5</td>
<td>Camarilla</td>
</tr>
<tr>
<td>80</td>
<td>Culture, Politics, and Society in Latin America</td>
<td>5</td>
<td>Wirth</td>
</tr>
<tr>
<td>186A</td>
<td>Modern South Asia: History, Society, Cultures—(Same as Cultural and Social Anthropology 75/175.)</td>
<td>5</td>
<td>Mancall, Pandya</td>
</tr>
<tr>
<td>202D</td>
<td>Undergraduate Colloquium: Biological Approaches to History</td>
<td>5</td>
<td>Lopez-Alonso</td>
</tr>
<tr>
<td>277</td>
<td>Undergraduate Colloquium: History and Public Policy—The Political Economy of Economic Growth</td>
<td>5</td>
<td>Lopez-Alonso</td>
</tr>
<tr>
<td>278</td>
<td>Undergraduate Colloquium: Historical Aspects of Underdevelopment in Latin America</td>
<td>5</td>
<td>Haber</td>
</tr>
<tr>
<td>281A/381A</td>
<td>Undergraduate/Graduate Colloquium: Environmental History of the Americas</td>
<td>5</td>
<td>Wirth</td>
</tr>
<tr>
<td>282/382</td>
<td>Undergraduate/Graduate Colloquium: The Agrarian Origins of Underdevelopment in Latin America</td>
<td>5</td>
<td>Summerhill</td>
</tr>
<tr>
<td>118</td>
<td>Human Diversity: A Linguistic Perspective—(Same as Anthropological Sciences 112.)</td>
<td>3</td>
<td>Ruhlen</td>
</tr>
<tr>
<td>119</td>
<td>Conservation Biology</td>
<td>3-4</td>
<td>Boggs, Launer</td>
</tr>
<tr>
<td>125</td>
<td>Environmental Policy and Law</td>
<td>5</td>
<td>Rosencranz</td>
</tr>
<tr>
<td>131</td>
<td>Natural Resources Policy and Law</td>
<td>5</td>
<td>Rosencranz</td>
</tr>
<tr>
<td>136</td>
<td>Conservation and Development Issues in the Amazon—(Same as Anthropological Sciences 161A.)</td>
<td>5</td>
<td>Stronza, Durham</td>
</tr>
<tr>
<td>141</td>
<td>Race, Poverty, and the Environment</td>
<td>5</td>
<td>Rosencranz</td>
</tr>
<tr>
<td>143</td>
<td>Globalization, Labor, and the Environment</td>
<td>4</td>
<td>Rosencranz</td>
</tr>
<tr>
<td>147</td>
<td>Controlling Climate Change in the 21st Century—(Same as Biological Sciences 147.)</td>
<td>3</td>
<td>Schneider, Rosencranz</td>
</tr>
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<td>150</td>
<td>Gender-Specific Perspectives on Birth Control</td>
<td>6</td>
<td>Djerassi</td>
</tr>
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<td>152</td>
<td>Environmental Policies and Institutions in Developing Countries</td>
<td>5</td>
<td>Rosencranz</td>
</tr>
<tr>
<td>160W</td>
<td>Seminar in Federal Health and Environment Programs/Agencies</td>
<td>3</td>
<td>Lee</td>
</tr>
<tr>
<td>167</td>
<td>International Health</td>
<td>3</td>
<td>Wang</td>
</tr>
<tr>
<td>172</td>
<td>Indigenous Forest Management</td>
<td>5</td>
<td>Irvine</td>
</tr>
<tr>
<td>181</td>
<td>Evolutionary Anthropology</td>
<td>5</td>
<td>Durham</td>
</tr>
<tr>
<td>215</td>
<td>International Environmental Politics</td>
<td>5</td>
<td>Mitchell</td>
</tr>
<tr>
<td>129</td>
<td>International Health Policy: Comparative National Health-Care Systems</td>
<td>3</td>
<td>Lee</td>
</tr>
<tr>
<td>134</td>
<td>Global Environmental Policy and Law</td>
<td>5</td>
<td>Rosencranz</td>
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<tr>
<td>215</td>
<td>International Environmental Politics</td>
<td>5</td>
<td>Mitchell</td>
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<td>87Q</td>
<td>Stanford Introductory Seminar: Urbanization, Poverty, and Children in Latin America</td>
<td>5</td>
<td>Morrison</td>
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MANAGEMENT SCIENCE AND ENGINEERING

192Q. Stanford Introductory Seminar: International Environmental Policy
4 units, Aut (Weyant)

194/294. The Role of Analysis in Environmental Policy Decisions
3-5 units, Spr (North)

5 units, Win (Blacker, May, Perry, Sagan)

248. Economics of Natural Resources
4 units (Sweeney) not given 2000-01

249. Growth and Development
3 units, Sum (de La Grandville)

298. Technology, Policy, and Management in Newly-Industrializing Countries—(Same as Science, Technology, and Society 279.)
2-4 units (Forbes) given 2001-02

446. Transportation, Energy, and Environment Research Roundtable (TEERR)
1 unit (Sweeney) not given 2000-01

OVERSEAS STUDIES

MOSCOW
21. Ethnic Moscow
3 units, Aut (Abashkin)

120X. Economic Reform and Economic Policy in Modern Russia
5 units, Aut (Mau)

PUEBLA
114X. Developmental Macroeconomics: The Mexican Case
5 units, Win (Cárdenas)

SANTIAGO
106H. Man-Environment Interactions: Case Studies from Central Chile
5 units, Aut (Hajek)

130X. Latin American Economics in Transition
5 units, Aut (Muñoz)

160X. Latin America in the International Economy
5 units, Win (Di Filippo)

162X. Core Seminar: Ecology-Policy Studies
5 units, Win (Hajek)

TOKYO
176K. Energy and Climate Change: The Japanese Approach
3 units, Spr (Masters)

PETROLEUM ENGINEERING

101. Energy and the Environment—(Same as Earth Systems 101.)
3 units, Spr (Kovscek)

260. Groundwater Pollution and Oil Spills: Environmental Problems in the Petroleum Industry
3 units (Staff) not given 2000-01

PHILOSOPHY

77. The Ethics of Social Decisions: Issues in Surrogate Decision-Making
4 units, Spr (Rosner)

POLITICAL SCIENCE

5 units, Win (Blacker, May, Perry, Sagan)

167/267. Seminar: Gender, Development, and Women’s Human Rights in International Perspective
5 units (Okin) not given 2000-01

213P. Seminar: Economic Reform and Development in Latin America
5 units, Spr (Packenham)

216M. Seminar: Environmental Politics in the Asia/Pacific Region
5 units (Oksenberg) not given 2000-01

297. Graduate Seminar: The Political Economy of Immigration
5 units (Wong) not given 2000-01

5 units, Aut (Eden, O’Nettl)

PUBLIC POLICY

50. Current Trends in Policy Making
3 units, Spr (Noll)

SCIENCE, MATHEMATICS, ENGINEERING CORE

5. Food and Water for a Changing Earth
4 units, Win (Knight, Staff)

4 units, Spr (Daily, Ehrlich)

SCIENCE, TECHNOLOGY, AND SOCIETY

110. Ethics and Public Policy
5 units, Win (McGinn)

279. Technology, Policy, and Management in Newly-Industrializing Countries—(Same as Management Science and Engineering 279.)
2-4 units (Forbes) given 2001-02

SOCIOLOGY

134. Education and the Status of Women: Comparative Perspective—(Same as Education 197.)
4-5 units, Win (Wotipka)

217. China’s Social Transformation
5 units (Walder) given 2001-02

PROGRAM ON URBAN STUDIES

182. Urban Environmental Policy
4 units, Win (Hall, Kibel)

183. Land-Use Control
4 units, Spr (Hall)

PSYCHOLOGY

Emeriti: (Professors) Albert H. Hastorf, Ernest R. Hilgard, Eleanor E. Maccoby, David L. Rosenhan, Roger N. Shepard, Carl Thoresen; (Senior Lecturers) Lyn K. Carlsmith

Chair: Mark R. Lepper

The courses and research opportunities in the Department of Psychology introduce students to the vast corpus of data on, and explanations of, human nature and human behavior. Through the study of abnormal behavior, aging, child development, cognitive processes, decision-making, emotion, group behavior, infancy, language and memory, personality, social perception, visual perception, and other related topics, students are introduced to the properties of sensory, cognitive, and affective systems, and of their interrelationships; to the reciprocal effects of one person on another; and to the effects on behavior of the physical, social, and cultural environment. The research programs of the faculty and students focus on the study of basic psychological mechanisms and, where appropriate, on relating basic research to the analyses and solutions of important societal problems.

The department, housed in Jordan Hall, maintains shop facilities and many computer-equipped laboratories. Bing Nursery School, located on campus at 850 Escondido Road, provides a laboratory for child observation, training in nursery school teaching, and research. It was constructed with funding from the National Science Foundation and a special grant from Mrs. Anna Bing Arnold and Dr. Peter Bing.

The department provides (1) courses designed for the general student, (2) a major program leading to the degree of Bachelor of Arts, including options for honors and a specialization in one of four content area tracks, (3) a minor program, (4) a coterminous master’s degree program leading to the degree of Master of Arts, and (5) programs of graduate study and research leading to the degree of Doctor of Philosophy. Applications are not accepted for the master’s degree except as noted below.

**UNDERGRADUATE PROGRAMS**

**BACHELOR OF ARTS**

**Major Requirements**—All students declaring a major in Psychology must complete a minimum of 55 units of course work in psychology. All courses taken to satisfy the 55-unit requirement must be taken for a grade of 'C-' or better (including the grades of 'S' and 'CR'). All majors complete Psychology 1, Introduction to Psychology, and one course in statistics. Beyond these two required courses, students must complete at least five of the following nine core Psychology courses:

20. Introduction to Brain and Behavior  
30. Introduction to Perception  
40. Introduction to Cognitive Psychology  
50. Introduction to Human Neuropsychology  
60. Introduction to Developmental Psychology  
70. Introduction to Social Psychology  
80. Introduction to Personality Psychology  
90. Introduction to Abnormal Psychology  
153. Introduction to Clinical Psychology

Students must take one writing intensive course (designated WIM) in psychology, and should check the *Stanford Bulletin* yearly as these courses may change.

Students may count up to 10 units of independent study and practica through Psychology 194 and 195, which are graded on a mandatory satisfactory/no credit basis. Students enrolled in the senior Honors program may take up to 15 units in independent study and practica, including Psychology 197 and 198.

Transfer students must take at least 28 units of course work in the department in order to receive the department’s recommendation for graduation. Such students may receive transfer units for courses completed in psychology at any accredited university or college provided that the courses were taught by a regular faculty member and were approved by the Transfer Credit Office. All students must satisfy the five-course core requirement through courses completed at Stanford.

**Beyond the Minimal Requirement**—Many students want a "stronger" program than the minimal requirements listed above. This may be achieved in any or all of these ways:

1. Within the general major, the student may take advanced undergraduate or graduate courses. The student may also take advantage of widespread opportunities for directed research, working closely with individual faculty and graduate students.
2. The student may apply to the senior honors program, described below.
3. The student may elect to pursue one of four specialization tracks: Cognitive Sciences; Health and Development; Mind, Culture, and Society; or Neurosciences.
4. The department strongly recommends that all majors take at least one seminar.

The training obtained from the pursuit of any of these options is valuable not only for students considering graduate work in psychology, but also for those thinking of professional careers outside of psychology.

**Note**—Students who declared the psychology major before Autumn Quarter 1996-97 have the option of completing their major requirements as described in the *Stanford Bulletin* 1995-96.

**MINORS**

**Declaration**—Students who wish to declare a minor field of concentration in Psychology must do so no later than the deadline for their application to graduate.

**Requirements**—Completion of a minimum of seven courses in psychology is required for the minor. Beyond Psychology 1 and 10, the minor must include three of nine core courses (20, 30, 40, 50, 60, 70, 80, 90, and 153) and at least two other courses within the department. All courses to be counted toward the minor must be passed with a grade of 'C-' or better.

**SPECIALIZATION TRACKS**

Students in the major program, including those in the honors program, may elect to specialize in one of four tracks, namely, Cognitive Sciences; Health and Development; Mind, Culture, and Society; and Neurosciences. Students must meet the general requirements for the major (Psychology 1, 10, and the five core courses) plus the requirements designated for the specialization track. Typically the courses required for the track include one or two required courses and four to six recommended courses in psychology, one or two advanced seminars, along with three to four courses in related disciplines. (Psychology courses completed for the track count toward satisfying the major requirements.) In the ideal case, the student who specializes would acquire an understanding of the range of psychological processes, as well as an appreciation of the significance of these processes in the chosen area of application. In this way, specialization could facilitate the student’s preparation for a professional career in, for example, medicine, business, or counseling, or for graduate work in psychology and a more academic career. Information about the required and recommended courses for each track is available from the undergraduate coordinator.

**HONORS PROGRAM**

The senior honors program is designed for exceptionally able students who wish to pursue a year of intensive supervised independent research. Admission to the program is made at the end of the student's junior year.
on the basis of (1) excellent academic performance, (2) previous research experience, and (3) recommendations by faculty and/or graduate students. An information meeting about the program is held in Winter Quarter.

Students interested in the program should involve themselves in research as early as possible and acquire a broad general background in psychology and a deep background in their chosen area. The program is particularly appropriate for students planning to go to graduate school in psychology and in other social sciences, as well as computer science, business, law, and medicine.

During Autumn and Spring Quarters of the senior year, students participate in a weekly seminar. In the autumn, the seminar is concerned with general methods and issues in psychological research. At the same time, students plan for research under the supervision of a prearranged faculty member, and proposals are presented orally at the seminar for discussion. A written copy of the proposal is turned in at the end of Autumn Quarter. During Winter and Spring quarters, students are primarily involved in completing research, presenting it to the seminar, and writing the honors thesis. Students present completed projects at a colloquium at the end of Spring Quarter, attended by students, faculty, and visitors.

GRADUATE PROGRAMS

MASTER OF ARTS

University requirements for the master’s degree are described in the “Graduate Degrees” section of this bulletin.

The Department of Psychology normally offers a Master of Arts degree only to students concurrently enrolled in its Ph.D. program or students concurrently pursuing A.B. or A.M. degrees. All applicants must satisfy University residency requirements for the degree and are responsible for consulting with their primary departments or the Financial Aid Office about the effects of the proposed program on their current funding.

Stanford undergraduate students who would like advanced training in psychology may apply for a coterminal A.M. degree in psychology. To do so, students should consult with the Student Services Officer in the department. Along with a coterminal program application, applicants must submit (1) a statement of purpose, (2) a preliminary program plan specifying the courses in which they intend to enroll to fulfill degree requirements, (3) at least two letters of recommendation from Stanford faculty members familiar with their academic work, (4) a current Stanford undergraduate transcript, and (5) a written agreement by a member of the Psychology faculty to serve as the student’s master’s degree adviser. This program is limited in size and admissions are selective. Students should apply to this program between the eighth and eleventh quarters of undergraduate study. The department’s deadline for the submission of an application to the coterminal program is March 20.

In exceptional cases, students concurrently enrolled in another doctoral or professional program at Stanford may also apply for the A.M. degree. Such applicants should also consult with the department’s Student Services Officer, and need to submit (1) a written agreement by a member of the Psychology faculty to serve as the student’s adviser, (2) a statement of purpose, (3) a preliminary program plan specifying the courses in which they intend to enroll to fulfill degree requirements, (4) at least two letters of recommendation from Stanford faculty members familiar with their academic work, (5) complete undergraduate transcript(s), (6) a current Stanford transcript, and (7) GRE (or professional school test) scores.

Students must complete at least 36 units of psychology courses for the degree. (For coterminal degree students, course work for the master’s degree may not duplicate courses taken for the undergraduate degree.) Of these 36 units, at least 18 must be in psychology courses numbered 200 or above. Units from Psychology 275 (Graduate Research) may not be counted toward these 18 units; service as a teaching assistant, through registration in 281 (Practicum in Teaching), may be counted for up to 3 of these 18 units. Two of the graduate courses must be selected from the courses listed as “core course” requirements. In addition, at least one statistics course beyond the introductory level is required. The course must be approved by the student’s adviser. All courses to be counted toward the master’s degree must be passed with a grade of ‘B’ or better (unless the course is offered only on a satisfactory/no credit basis). Demonstration of competence in the design and execution of psychological research is also required for receipt of the master’s degree. Normally, this demonstration entails completion of a master’s thesis. However, evidence of other research experience (notably the completion of a senior honors thesis) may be substituted for a formal master’s thesis upon approval of the department’s Committee on Graduate Studies. Participation in graduate research is required for the master’s degree. Students enrolled in the coterminal program must meet the University’s residency requirement.

DOCTOR OF PHILOSOPHY

There are no specific course requirements for admission to the doctoral program. However, an applicant should have research experience as an undergraduate, as well as the equivalent of an undergraduate major in psychology. The major focus of the doctoral program is on research training, and admission is highly selective.

Applicants for admission must submit their scores on the Graduate Record Examination (both general and psychology subject tests) as part of the application. This examination may be taken at most universities and colleges.

University requirements for the Ph.D. are described in the “Graduate Degrees” section of this bulletin. In addition to fulfilling the residence requirement for the degree, the following requirements are stipulated.

First-Year Course Requirements—During the first year of graduate study, the student must take 207 (Proseminar for First-Year Ph.D. Graduate Students), at least one approved graduate statistics course, and at least two core courses from the list below. (Social Ph.D. graduate students must take 212, 215, and 259.)

- 202. Neuroscience
- 205. Foundations of Cognition
- 211. Developmental Psychology
- 212. Social Psychology
- or 215. Mind, Culture, and Society
- or 259. Emotions: History, Theories, Research
- 213. Personality

The student is expected to spend at least half of the time in research from the beginning of the first year of graduate study to the completion of the Ph.D., normally taking no more than 9 units of course work each quarter. At the end of the first year of graduate study, the student must file with the department a written report of the first-year research activities.

Second-Year Course Requirements—During the second year of graduate study (or as additional courses during the first year), the student must complete the core courses listed above and take a second approved graduate course in statistics.

Third-Year Major Area Paper—During the first week of Autumn Quarter of the fourth year, the student must turn in a Conceptual Analysis of the Dissertation Area (CADA). This paper provides a general framework for the research topic of the dissertation, addresses the central issues within the specialty area, and reviews the pertinent literature. Typically, the analysis has the kind of scope found in the opening chapters of the more traditional dissertations, but the exact format and scope of the paper is a joint decision made by student and adviser.

Prior to Autumn Quarter, the student should select two faculty members to read the paper and give feedback and commentary on it. These should be two faculty members most likely to serve on the later oral committee of the dissertation. A portion of the paper, revised as appropriate, can then become the first section of the actual dissertation proposal. If the student should radically change the area of the dissertation research after the CADA has been written, the formal CADA procedure does not need to be repeated for the second dissertation topic. The student is still expected to be knowledgeable about the literature and problems of any research topics being pursued for the dissertation.
Minor Requirements—The candidate must complete either a University minor satisfactory to the minor department, or elect to have the minor waived by selecting 12 approved units outside the department. A student designating a program of 12 units outside the Department of Psychology is expected to do so in consultation with the adviser.

Dissertation Reading Committee—The candidate must select a dissertation reading committee satisfactory to the department. The minimum membership of this committee must be (1) the principal dissertation adviser, (2) a second member from within the department, and (3) a third member chosen from Psychology or another department.

Orals—The candidate must pass the University oral examination, which is based on the dissertation proposal, not on the completed dissertation. The reason for this policy is to permit the oral examination to serve the function of guiding and improving the proposed research. This function can best be served if the oral examination is scheduled early in the year in which the dissertation research is conducted. It is therefore expected that the oral examination will be taken by the end of the Autumn Quarter of the fourth year.

Dissertation Requirements—The candidate must complete a dissertation satisfactory to the dissertation reading committee.

Ph.D. candidacy expires five years after admission to candidacy by the University Committee on Graduate Studies. Reapplication requires department reexamination.

STUDENT EVALUATIONS

First-Year Evaluation—It is the department’s policy to evaluate the progress of each graduate student at the end of the first year of graduate study. As part of the procedure, each student is required to file with the department a report of the first-year research activities.

Students should discuss this report and the evaluation procedures with their adviser as early as possible in their first year. The report is due on June 1. If the student fulfills the academic promise displayed upon entrance, he or she is invited to continue to the doctorate.

The first-year evaluation is primarily based on three factors:
1. Quality of research carried out in the first year
2. Performance in courses (especially required courses)
3. Recommendations of the adviser (including a commitment on the part of that adviser to continue in that role)

Second-Year Evaluation—A similar evaluation is conducted at the end of the second year of graduate training involving the same criteria as the first year; however, the student is not required to submit a paper. Students who do not make satisfactory progress during the second year may be dropped from the program.

THE DOCTORAL TRAINING PROGRAM

As indicated by the requirements described above, a student may concentrate in any one of several areas within psychology. Regardless of area, however, the training program places emphasis on the development of research competence, and students are encouraged to develop those skills and attitudes that are appropriate to a career of continuing research productivity.

Two kinds of experience are necessary for this purpose. One is the learning of substantial amounts of technical information. A number of courses and seminars are provided to assist in this learning, and a student is expected to work out a program, with his or her adviser, to attain this knowledge in the most stimulating and economical fashion.

A second aspect of training is one that cannot be gained from the courses or seminars. This is firsthand knowledge of, and practical experience with, the methods of psychological investigation and study. These methods include ways of behaving with the people or animals being studied. Students are provided with whatever opportunities they need to reach those levels of competence representative of doctoral standing. Continuing research programs, sponsored by members of the faculty, offer direct opportunities for experience in fields represented by the faculty’s many research interests.

Each student achieves competence in unique ways and at different rates. Each student and adviser share in planning a program leading to the objectives discussed. The student is expected to spend half of his or her time on research and normally takes no more than 9 units of course work per quarter.

TEACHING REQUIREMENT

The department views experience in supervised teaching as an integral part of its graduate program. Regardless of the source of financial support, all students serve as teaching assistants for four Psychology courses during their graduate study. Of the four courses, one of them should be Psychology 1, General Psychology, and another should be Psychology 10, Statistical Methods. Students are discouraged from participating in teaching during the first year of graduate study. Students typically progress from closely supervised teaching to more independent work. They usually begin by teaching sections of General Psychology and Statistics and then progress to more advanced courses in their area of specialization. They may offer a supervised, but essentially independent, seminar during their final year of graduate study.

Ph.D. MINOR

Candidates for the Ph.D. degree in other departments may elect a minor in psychology. To obtain a minor, the student must complete 20 units of course work at the graduate level in the Department of Psychology, excluding Psychology 275 (graduate-level research). Cross-listed graduate courses can be used to satisfy this requirement. All courses counting toward the Ph.D. minor must be passed with a grade of ‘B-’ or better (unless the course is offered only on a satisfactory/no credit basis).

COGNITIVE SCIENCE PROGRAM

Psychology is participating, along with the departments of Computer Science, Linguistics, Philosophy, and the School of Education, in an interdisciplinary program of cognitive science. The program is intended to provide students with an interdisciplinary education as well as a deeper concentration in psychology. Doctoral students in psychology are eligible to participate in the Cognitive Science program. Students who complete the requirements receive a special designation in cognitive science along with the Ph.D. in Psychology. To receive this field designation, students must complete 30 units of approved courses, 18 of which must be taken in two disciplines outside of psychology. For information or course approval, see the program adviser, Professor Tenenbaum.

PSYCHOLOGY COLLOQUIUM

The Psychology Colloquium meets on most Wednesday afternoons at 3:45. Speakers from Stanford and other institutions present topics of current interest. Graduate students are expected to attend.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirement.

SUMMER SESSION

The courses announced for the Summer Session are those regularly scheduled in the department curriculum. Additional courses may be announced in the Stanford University bulletin Summer Session 2001, issued in January.

STANFORD INTRODUCTORY SEMINARS

3N. Stanford Introductory Seminar: Culture and Mind—Preference to freshmen. Explore the ideas that cultures and mind make each other up, including the role of culture in cognition, emotion, and motivation. 3 units (Markus) not given 2000-01

4N. Stanford Introductory Seminar: Affect and Cognition—Preference to freshmen. The psychological processes of emotions as they influence behavior, emphasizing the relation of emotions to other psychological concepts such as cognition and motivation. Conscious and
nonconscious emotional influences. Three units for paper and final exam; 2 units for final exam only.

2-3 units (Zajonc) not given 2000-01


3 units (Zimbardo) not given 2000-01

6N. Stanford Introductory Seminar: Remembering and Misremembering—Preference to freshmen. Discussion of experiments and cases of errors, biases, distortions, and omissions in memory, and understanding them in light of a theory of memory.

3 units, Win (Tversky)

8N. Stanford Introductory Seminar: Evaluating Popular Media Accounts of Social Science Findings—Preference to freshmen. Introduction to the concepts and concerns of social psychology through pop media and user-friendly “trade books,” e.g., Frank Sulloway’s Born to Rebel which deals with the impact of birth order, and Dick Nisbett’s Culture of Honor which deals with the reasons for high homicide rates in the American south. Critical considerations of articles, books, and documentary film are intended for lay people that deal with findings relevant to social psychology and related fields. Documentary films and magazine articles deal with the impact of parents on delinquency and achievement, and with various social problems and policy issues, e.g., affirmative action and crime. Limited enrollment.

3 units (Ross) not given 2000-01

9N. Stanford Introductory Seminar: The Social Psychology of Race, Gender, and Culture—Preference to freshmen. Focus is on the role that one’s social context (one’s position in society and social identity) plays in shaping the psychology of the individual and the collective psychology of society more generally.

3 units (Steele) not given 2000-01

11N. Stanford Introductory Seminar: Origin of Mental Life—Preference to freshmen. Mental life begins in infancy, so understanding the human mind requires discovering how thinking originates. How do babies construe the objects, events, people, and language that surround them? Recent advances in psychological theory and methods permit answers to questions once thought intractable. The methods, hypotheses, and evidence about how the human mind develops in infancy. Student summaries and critiques of studies that have been the most influential in the field of infant cognition.

3 units, Spr (Markman)

12Q. Stanford Introductory Dialogue: Emotion—Preference to sophomores. What is emotion? Why do we have emotions? Can we change our emotions? How do different people’s emotions differ? Can emotions make us sick? Focus is on experimentally tractable questions, and empirical research findings relevant to these questions, emphasizing critical thinking and writing skills. Limited enrollment.

2 units, Aut (Gross)


3 units, Aut (Hastorf)


3 units, Aut (R. Fernald)

OPEN TO ALL STUDENTS

Additional courses not listed here are frequently offered by selected postdoctoral or terminal Ph. D. personnel in the areas of their special research. These are listed in the quarterly Time Schedule; the course descriptions are circulated in advance.

1. Introduction to Psychology—The scientific study of behavior, focusing on psychological research and theory. Topics: the biological bases of behavior, sensation and perception, emotion, learning, memory, cognition, child development, psychopathology, and social psychology. (Sections optional) GER:3b (DR:9)

4-5 units, Aut (Gross)

Win (Zimbardo)

Spr (Staff)

3. Practicum in Effective Teaching Methods and Style—Enrollment limited to advanced undergraduates serving as teaching assistants in Psychology 1. Discussions on teaching methods and style, selected readings on teaching effectiveness, student presentations to class sections, preparation of exams, and grading essays and term papers.

3 units, Win (Zimbardo)

10. Introduction to Statistical Methods—(Same as Statistics 60.) Emphasis is on techniques for organizing data, computing, and interpreting measures of central tendency, variability, and association. Estimation, confidence intervals, tests of hypotheses, t-tests, correlation, and regression. Possible topics: analysis of variance and chi-square tests, computer statistical packages. GER:2c (DR:4)

5 units, Aut (Holmes)

Win (Staff)

Spr (Walther)

20. The Introduction to Brain and Behavior—How the brain regulates behavior and in turn is influenced by behavioral interactions. Behavior is described in physiological terms, organized with respect to evolutionary principles. Topics: neurons, transmission of neural information, anatomy and physiology of sensory and motor systems, regulation of body states and the biology of learning, memory, and psychopathology. Recommended: 1. GER:2a (DR:5)

3 units, Aut (R. Fernald)


4 units, Win (Gabrieli)

40. Introduction to Cognitive Psychology—Survey and analysis of major topics in cognitive psychology, including perception, memory, problem solving, and reasoning. Emphasis is on contemporary research and theory. Recommended: 1 and 10. GER:3b (DR:9)

4 units, Win (Speler)

30. Introduction to Perception—Perceptual psychology and sensory neuroscience, emphasizing vision and hearing. Topics: anatomy and physiology of the eye and ear, and of the visual and auditory areas of the brain, pitch and loudness perception, speech perception, color vision, depth perception, visual motion perception, etc. Recommended: 1. GER:3b (DR:9)

3 units, Aut (Heeger)


4 units, Win (Gabieli)

60. Introduction to Developmental Psychology—Psychological development from birth to adulthood, emphasizing infancy and the early and middle childhood years. The nature of change during childhood and theories of development. Recommended: 1. GER:3b (DR:9) (WIM)

3 units, Aut (Flavell)
60A. Introduction to Developmental Psychology Section—Guided observation of children age 2-6 at Bing Nursery School. Corequisite: 60.
2 units, Aut (Hartman)

70. Introduction to Social Psychology—Surveys, theory, and empirical research on social psychological topics: attitudes and persuasion, identity, person perception, compliance, obedience, aggression, interpersonal and intergroup relationships, social conflict, prejudice, stereotyping, roles, attribution, and social judgment. Two lectures plus section each week. Original research proposal. Recommended: 1. GER:3b (DR:9) (WIM)
4 units, Spr (Ross, Steele)

80. Introduction to Personality Psychology—A broad, balanced introduction to the study of personality. Key concepts and research methods, major theoretical approaches, and related empirical findings. Includes psychodynamic, trait, biological, humanistic, behavioral, social-learning, cognitive, and cultural perspectives. Recommended: 1.
3 units, Win (Tsai)

90. Introduction to Abnormal Psychology—The nature, origin, and treatment of a variety of psychological disturbances, examined from psychodynamic, behavioral, cognitive, and biomedical perspectives. Historical and current controversies in the field. Recommended: 1. GER:3b (DR:9)
3 units (Staff)

102. Statistical Methods for Behavioral and Social Sciences—See 252.
103. Statistical Theory, Models, and Methodology—See 253.
110. Research Methods and Experimental Design—Experimental research methods and principles in psychology. Structured research exercises and the design of an individual research project. Prerequisite: consent of instructor. (WIM)
5 units, Spr (M. Lepper)

112. Research Methods in Cognitive Psychology—Focus is on conceptual and methodological issues that arise in research in the areas of cognitive science and cognitive neuroscience. Training in the logic and techniques of research provides students with the skills necessary for research in cognitive science. Students conduct several experiments, analyze their data, and interpret the results.
5 units, Aut (M. Lepper)

120. Cellular Neuroscience: Cell Signaling and Behavior—Survey of neural interactions underlying behavior. Prerequisites: 1 or equivalent, and elementary biology.
4 units, Aut (Wine)

121. Ion Transport and Intracellular Messengers—(Graduate students register for 228.) Ion channels, carriers, ion pumps, and their regulation by intracellular messengers in a variety of cell types. Lab demonstrations and brief hands-on introduction to some techniques (e.g., patch clamping). Recommended: 120 or introductory course in biology or human biology.
3 units, Spr (Wine)

122. Human Behavioral Biology—(Enroll in Biological Sciences 150.)
6 units (Sapolsky) alternate years, given 2001-02

123. Graduate Seminar in Cognitive Neuroscience—See 222. Prerequisite: consent of instructor
1-3 units, Aut, Spr (Gabrieli) Win (Staff)

124. Seminar on Psychophysiology—See 236. Prerequisite: consent of instructor.
4 units, Win (Gross)

126. Sleep and Dreams—(Enroll in Human Biology 11.)
3 units, Win (Dement)

131. Language and Thought—The psychology of language, including production and understanding in utterances; from speech sounds to speaker’s meaning; children’s acquisition of the first language; and the psychological basis for language systems. Language functions in natural contexts and their relation to the processes by which language is produced, understood, and acquired. Prerequisite: 1 or Linguistics 1. GER:3b (DR:9)
4 units, Aut (Clark)

132. Language Processing—Influential theories, computational models, major issues, and research in psycholinguistics. Emphasis is on sentence- and word-level processes in human language comprehension and production. Prerequisite: 40.
4 units, Win (Griffin)

134. Seminar on Language and Deception—Deceptive, exploitative, and other noncooperative uses of language. How is language used to deceive or exploit? Where are these techniques practiced and why? What are the personal, ethical, and social consequences of these practices?
Prerequisite: 131, Linguistics 1, or Philosophy 181.
3 units, Win (H. Clark)

136. Cognition and Aging—(Graduate students register for 225.) Survey of research examining the influence of aging on cognition. Topics: the influence of aging on attention, language, memory, and the cognitive effects of age-related neurological disorders such as Alzheimer’s and Parkinson’s disease. Prerequisite: 40.
3 units, Spr (Sirpler)

141. Cognitive Development—Topics and issues on cognitive development, developmental changes in memory, conceptual organization, logical reasoning, and communication skills. Prerequisite: 1. GER:3b (DR:9)
3 units, Spr (Johnson)

142. Social Development—Socialization and the development of social behaviors. Review of research concerning conscience and conduct, altruism and aggression, cooperation and competition, achievement motivation, and self-control.
3 units (M. Lepper) not given 2000-01

144. Conceptual Organization and Development—See 242. Prerequisite: 141 or consent of instructor.
1-3 units (Markman) not given 2000-01

145. Seminar on Infant Development—For students interested in research skills. Focus is on conceptual and methodological issues related to research on early development; training in experimental design, lab, and observational procedures; and the collection, analysis, and interpretation of data. Limited enrollment.
1-3 units (A. Fernald) not given 2000-01

146. Observation of Children—Seminar on learning about children through guided observations at Bing Nursery School, Psychology’s lab for research and training in child development. Physical, emotional, social, cognitive, and language development. Recommended: 60.
3-5 units, Win, Spr (Hartman)

147. Development in Early Childhood—Supervised experience with young children at Bing Nursery School. Three units require four hours per week in Bing classrooms throughout the quarter; 4 units require seven hours per week; 5 units require 10.5 hours per week. Weekly seminar on
152. Social Conflict: Models and Methods of Mediation—Conceptual models of social conflict and approaches to resolving them through mediation. Examples from a spectrum of conflict settings ranging from minor disputes between individuals to intragroup and intergroup tensions. Existing theories and empirical research. Students generate examples from the Stanford community, and role play methods of mediation in resolving social conflict.

3 units, Spr (Horowitz, Martinez)

153. Introduction to Clinical Psychology—Survey and analysis of topics in clinical psychology: the history of clinical psychology, models and assessment of personality, behavior, cognition, psychopathology, and approaches to the treatment of abnormal behavior. Emphasis is on current theory, research, and issues in clinical psychology and on the role of clinical psychology in contemporary society. Recommended: 1.

3 units, Win (Gotlib)

154. Selected Topics in Affective Disorders—See 234.

3 units, Spr (Gotlib)

155. Research Lab on Stereotyping and Prejudice—Two-quarter practicum. Students participate in on-going laboratory research on stereotyping and prejudice. Emphasis is on theoretical and methodological issues, research design, data collection and analysis. Prerequisites: 1, 70, research experience, and consent of instructor.

3 units (Eberhardt) not given 2000-01

156. Applications of Social Psychology—(Graduate students register for 271.) The application of social psychological theory and research to a variety of issues and problems: evaluating the impact of social interventions, strategies, and shortcomings in personal and social decision making; the effects of mass media and other sources of social persuasion; problems of conflict resolution and negotiation; applications of social psychology in legal, medical, educational, and business settings. Prerequisites: 1 and 10, or consent of instructor.

4 units (Ross) not given 2000-01

157. Theoretical Approaches in Social Psychology—(Graduate students register for 279.) The field of social psychological research, organized by the theories and systems that tie together wide-ranging findings and phenomena. Possible topics: how attitudes, beliefs, and self-concepts originate in our actions; the importance of construal and cognition in social-psychological phenomena; and the relationships between thought and emotion, and health. Emphasis is on developing a systematic understanding of the field of social psychology.

3 units (Steele) not given 2000-01

158. Emotions: History, Theories, and Research—See 259. Prerequisite: consent of instructor.

3 units, Spr (Zajonc)

159. Psychological Perspectives on the Self—(Graduate students register for 223.) The evolution of scientific conceptions of the self; developmental approaches; motivational and cognitive self processes; applications of self and self-regulation theory to depression, gender roles, and achievement outcomes. Modernist and postmodernist conceptions of self, and the importance of cultural influence. Changes in the nature and phenomenological experience of the self as a function of historical periods. Prerequisites: 1, 10, 70.

3 units (Steele) not given 2000-01

160. Culture and Self—See 226. Prerequisites: 1, 10, 70.

3 units, Win (Markus) alternate years, not given 2001-02

161. Cultural Psychology—The cultural sources of diversity in thinking, emotion, motivation, self, personality, morality, development, and psychopathology. Prerequisite: 1 or equivalent. GER:4a (DR:2) (WIM)

5 units, Spr (Markus)

162. Psychology of Gender—Research and theory on the socialization and psychological development of women and men. The biological, cultural, and social factors that influence gendered behavior. GER:4c (DR:6)

4 units, Win (Carstensen)

163. The Interpersonal Basis of Abnormal Behavior—The role of interpersonal problems and processes in producing different forms of psychopathology, from neurotic reactions to schizophrenia. The clinical (case study) approach is combined to clarify the origin, nature, and treatment of emotional disorders. Prerequisite: 90.

3 units, Spr (Horowitz)

165. Peace Studies—(Same as Political Science 133.) Interdisciplinary, dealing with the challenges of pursuing peace in a world where the sources of conflict are many, and regional, ethnic, and religious antagonisms are rising. The art of creating and maintaining peace is analyzed from historical, social, psychological, and moral perspectives. Goals: illustrate the current and potential contributions of various academic disciplines and critical analyses to the study of peace; and to prepare students to think critically and to act responsibly and effectively on behalf of peace. Eight sections: challenges, enemies, theoretical understandings, justice, security, non-violence, public peace processes, peace, and you. Seminar format once a week. Limited enrollment. GER:3b (DR:9)

3 units, Spr (Bland, Ross, Holloway)

166. Seminar on Personal and Social Change—Analysis of the social cognitive approaches to personal and social change. Applications of sociocognitive theory to the modification of psychological dysfunctions in familial, educational, medical, and organizational settings. Ethical and value issues in behavior change.

3 units, Spr (Bandura)

167. Seminar on Aggression—Analysis of the causes and modification of individual and collective aggression. Major issues in aggression: social labeling of injurious conduct, social determinants of aggression, effects of the mass media, institutionally sanctioned violence, terrorism, psychological mechanisms of moral disengagement, modification of aggressive styles of behavior, and legal sanctions and deterrence doctrines.

3 units, Win (Bandura)

168. Evolutionary Psychology—See 268.

5 units, Win (Hirschfeld)


3 units, Aut (Gross)

170. Seminar on the Psychology of Gender—(Graduate students register for 238.) In-depth coverage of a specified topic related to the psychology of gender. Prerequisite: 162.

3 units (Carstensen) not given 2000-01

171. Research Seminar on Aging—Two-quarter practicum exposes students to multiple phases of research by participating in a laboratory focusing on social behavior in adulthood and old age. Review of current research and participation in ongoing data collection, analysis, and interpretation. Prerequisites: 1, research experience, and consent of instructor.

4 units, Aut, Win, Spr (Carstensen)

173. Mind, Culture, and Society Research Lab—For undergraduate juniors only, taking Mind, Culture, and Society track. Offered over two
quarters. The first quarter is a lecture series on current research topics in mind, culture, and society. During the second quarter, students participate in a specific research project.  
4-5 units, Win, Spr (Eberhardt)

174. African American Psychology—Introduction to ethnic psychology, specifically, the psychological dimensions of the Black experience in America. Lectures and readings. Black psychology from its evolution as a concentration area in the social sciences to present concerns that impact Black Americans’ mental health. Students are encouraged to expand on the methodological constructs employed in the study of Black Americans. Section offered.  
3-4 units, Aut (McCants)

175. Seminar on Topics in Identity Development—Issues affecting identity development from adolescence throughout adulthood. Lectures/discussion. Topics: the effect of group dynamics on identity; the impact of social factors such as racism, stereotypes, and culture; how a person’s identity affects education and self-esteem.  
3 units, Win (McCants)

176. Carl Jung and Analytical Psychology—Introduction to the person of Jung, his seminal philosophical perspectives, and their impact on modern thought and life. The formation of analytical psychology with regards to Jung’s past relationship with Freud and later emergence as a prominent 20th-century thinker. Emphasis is on the archetypal themes of the shadow, animus/animus (feminine/masculine) and puer/senex (youth/elder). The function of dreams and the interplay between the Jungian paradigm and spirituality.  
4 units (Daheer) not given 2000-01

177. Senior Seminar on Mind, Culture, and Society—For undergraduate seniors only taking Mind, Culture, and Society track.  
3 units (Eberhardt) given 2001-02

178. Stigma and Marginality—See 263.  
3 units (Eberhardt) alternate years, given 2001-02

179. Culture and Cognition—See 278.  
5 units, Aut (Hirschfeld)

180. Social Psychological Perspectives on Stereotyping and Prejudice—See 245. Prerequisites: 1, 10, and 70.  
4 units (Eberhardt) alternate years, given 2001-02

181. Social Influence and Persuasion—(Same as 229.) Theories and research on social influence, conformity, obedience, and persuasion from Aristotle to the present, looking at the relative effectiveness of direct approaches to persuasion, e.g., advertising and political campaigns; and less direct strategies, e.g., inducing individuals to engage in “self-persuasion” in order to justify their own prior actions. Societal issues involving social influence, including attempts at reducing prejudice and curbing aggression, and the subtle forms of persuasion that occasionally take place during police interrogation. Prerequisite: 1.  
3 units, Spr (Aronson)

2 units (Markus, Ross) not given 2000-01

194. Reading and Special Work—Independent study. Can be repeated for credit. Prerequisite: consent of instructor.  
1-3 units, any quarter (Staff)

195. Special Laboratory Projects—Independent study. Can be repeated for credit. Prerequisites: 1, 101, and consent of instructor.  
1-6 units, any quarter (Staff)

196. Contemporary Psychology: Overview of Theory, Research, Applications—For junior and senior psychology majors. The state of the field of psychology in each of the primary areas represented by the department; psychobiology, cognitive neuroscience, cognitive science, developmental psychology, personality and abnormal psychology, and social psychology. Faculty in each area present an overview of current theory, research, and applications in their domain of expertise during weekly lectures, integrating the wide range of knowledge majors have gathered from their more specialized course work. Discussion sections. Recommended: 1.  
3 units, Aut (Thomas, Van der Wege, Zimbardo)

197. Advanced Research—Limited to students in senior honors program. Weekly research seminar, independent research project under the supervision of an appropriate faculty member. A detailed proposal is submitted at the end of Autumn Quarter. Research continues during Winter and Spring quarters as 198. A report demonstrating sufficient progress is required at the end of Winter Quarter.  
1-4 units, Aut (Tversky)

198. Senior Honors Research—Limited to students in the senior honors program. Work includes finishing the research and data analysis, written dissertation, and presentation at the Senior Honors Convention.  
1-4 units, Win, Spr (Tversky)

199. Psychological Aspects of Addiction—The medical, psychological, and social issues involved with alcohol and drug abuse and dependence. Students are presented with the etiological theories and psychological perspectives on addiction. Limited enrollment.  
3 units, Aut (Matano)

PRIMARILY FOR GRADUATE STUDENTS

Undergraduate students admitted only by consent of instructor.

3 units, Spr (Wandell, Gabrieli)

203. Foundations of Vision—The quantitative behavioral and neural aspects of human vision. Image formation by the eye, retinal sampling and wavelength encoding, neural encoding within the retina and cortex; performance measures including spatial contrast sensitivity, localization, color sensitivity, multiresolution representations of image data; color, motion, and depth perception.  
1-3 units (Wandell) alternate years, given 2001-02

205. Foundations of Cognition—Advanced survey of cognitive psychology and cognitive science. Major topics: perception, imagery, attention, memory, similarity, categories and concepts, learning, reasoning, decision making, planning, language, emotions, morality, mate choice, consciousness. Focus is on what computational problems the mind is designed to solve, how it solves them, and how those solutions might be implemented in the brain. Central themes for discussion: the nature of mental representations, inference under uncertainty, rationality vs. irrationality, modular vs. general-purpose design, learning vs. evolutionary origins. Prerequisite: 207 or consent of instructor.  
1-3 units, Aut (Tenenbaum)

206. Behavioral Neuroscience—The biological substrates of behavior, emphasizing topics currently being investigated by resident and visiting neuroscientists at Stanford. Possible topics: neuroanatomical and neurophysiological aspects of vision; audition; motor control, learning, and memory; and hormonal and neurochemical aspects of stress and motivation.  
1-3 units, Spr (Wandell, Wine) alternate years, not given 2001-02
207. Proseminar for First-Year Ph.D. Graduate Students—Required of and limited to first-year Ph.D. graduate students in psychology. Survey of major issues in contemporary psychology with their historical backgrounds.
   2-3 units, Aut (M. Lepper)

210. Memory and Learning—Major topics in human memory, emphasizing information-processing approaches to short-term memory, organization and long-term memory, forgetting, retrieval processes, prose memory, imagery, emotional memory, autobiographical memory, and skills. Prerequisite: graduate standing in psychology or consent of instructor.
   4 units, Win (Bower)

211. Developmental Psychology—Prerequisite: 207 or consent of instructor.
   1-3 units, Win (Flavell, Johnson)

212. Social Psychology—Prerequisite: 207 or consent of instructor.
   1-3 units, Aut (M. Lepper, Ross)

213. Personality—Survey of theory and research in personality. Prerequisite: 207 or consent of instructor.
   3 units (Carstensen) alternate years, given 2001-02

214. Psycholinguistics—Prerequisite: graduate standing in Psychology or consent of instructor.
   1-3 units, Spr (H. Clark)

215. Mind, Culture, and Society—Social psychology from the context of society and culture. Focus: the interdependence of psychological and sociocultural processes; how sociocultural factors shape psychological processes; how psychological systems shape sociocultural systems. Conceptualizations of the interdependence of psychological processes and sociocultural context. Use of theoretical developments to understand social issues, problems, and polity. Works of Baldwin, Mead, Asch, Lewin, Burner, and contemporary theory and empirical work on the interdependence of psychology and social context as constituted by gender, ethnicity, race, religion, region of the country, and part of the world. Prerequisite: 207 or consent of instructor.
   3 units, Win (Markus, Steele)

216. Graduate Abnormal Psychology—The major mental and personality disorders are examined using concepts from contemporary psychological thought. Basic principles are drawn from social learning, and psychodynamic and interpersonal perspectives and are applied systematically to each disorder to clarify its etiology, manifestations, and goals of treatment.
   3 units, Win (Horowitz)

217. Selected Topics and Methods in Cultural Psychology—Discussion and critical examination of conceptual and methodological issues in cultural psychology. Topics: the mechanisms by which culture influences psychological and social processes in monocultural and multicultural contexts; the relations between culture and biology; the measurement of culture; the development of culturally appropriate instruments and tasks; and the use of various questionnaire, interview, observational, and physiological methods to study cultural influence in human behavior.
   1-3 units, Spr (Tsai)

218. Social Psychology Seminar—Discussion of social psychological theories and research. Offered in conjunction with 212. For psychology graduate students only.
   1-2 units, Aut (Eberhardt)

219. Graduate Seminar on Selected Topics in Cognition—Prerequisite: consent of instructor.
   1-3 units, Aut (Tversky)

220. Graduate Seminar: Special Topics in Cognitive Development—Prerequisite: graduate standing in psychology or consent of instructor.
   1-3 units (Markman) not given 2000-01

221. Applied Vision and Image Systems—Lectures/demonstrations illustrate the design and control of color imaging devices (display, printers, cameras, and scanners). Aspects of human vision relevant to software and hardware design. Topics: digital halftoning, color calibration, color metrics, flicker sensitivity, motion compensation, human spatial resolution, visual masking, JPEG principles, printer design, scanner design, color software architecture. Lab.
   1-3 units, Win (Wandell)

222. Graduate Seminar in Cognitive Neuroscience—(Undergraduates register for 123.) For students who are already or planning to become involved in research. Critical reviews of theory and ongoing research in human cognitive neuroscience. Prerequisite: consent of instructor.
   1-3 units, Aut, Spr (Gabrieli) Win (Staff)

223. Psychological Perspectives on the Self—See 159.
   1-3 units (Steele) not given 2000-01

224. Learning and Inference in Humans and Machines—The connections between computational models and experimental studies of human learning and inference in several domains: visual perception, memory and information retrieval, supervised and unsupervised categorization, language acquisition, inductive and causal reasoning. Goals: to reach a better understanding of human learning in computational terms and to bring computational systems closer to the capacities of human learners. Probabilistic models and statistical inference are unifying themes. Lectures, presentations, and discussion, with supplementary computer assignments. Final modeling project or paper required. Prerequisite: consent of instructor. Recommended (one or more): 205, 210; Computer Science 221, 228, 229; Statistics 315A,B,C.
   1-3 units, Spr (Tenenbaum)

   3 units, Spr (Spierer)

226. Culture and Self—(Undergraduates register for 160.) Recent perspectives on the nature and functioning of self; anthropological and psychological literature on the self in various cultural contexts; and the consequences of variation in selfhood for cognition, learning, emotion, motivation, and psychopathology.
   1-3 units, Win (Markus) alternate years, not given 2001-02

227. Seminar on Language Processing—Processing the differences that languages may impose on their speakers; similarities and differences in how speakers of more than one language and monolinguals speak and comprehend. Do speakers of a language with grammatical gender have to prepare words further in advance or operate under a heavier memory load? Under what circumstances might a bilingual's languages interfere with or support each other?
   3 units, Spr (Griffin)

228. Ion Transport and Intracellular Messengers—See 121.
   1-3 units, Spr (Wine) alternate years, not given 2001-02

   3 units, Spr (Aronson)

231. Graduate Seminar: Self-Efficacy—The origins, mediating mechanisms, and diverse effects of people's beliefs in their efficacy to exercise control over events in their lives. Alternative theories of perceived control; the nature and structure of self-efficacy belief systems; major sources of efficacy beliefs; the processes through which they affect human functioning; developmental analysis of efficacy beliefs over life course; the application of self-efficacy theory to cognitive development,
biological, cognitive, and psychological aging. Emphasis is on the bicultural role conflict. Informal supervised experience. Topics: epidemiology and phenomenology of affective disorders, psychodynamic and cognitive theories of depression, gender differences in affective disorders, cognitive and social functioning of depressed persons, psychobiological theories of affective disorders, depression in children, postpartum depression, suicide issues in the treatment of depression, and cultural aspects of affective disorders. Prerequisite: graduate standing in psychology or consent of instructor.

1-3 units (LaFromboise) not given 2000-01

233. Counseling Theories and Interventions from a Multicultural Perspective—(Enroll in Education 233A.)
3 units (LaFromboise) not given 2000-01

234. Selected Topics in Affective Disorders—(Undergraduates register for 154.) Current research topics in the study of affective disorders. Topics: epidemiology and phenomenology of affective disorders, psychological theories of depression, gender differences in affective disorders, cognitive and social functioning of depressed persons, psychobiological theories of affective disorders, depression in children, postpartum depression, suicide issues in the treatment of depression, and cultural aspects of affective disorders. Prerequisite: graduate standing in psychology or consent of instructor.

1-3 units (LaFromboise) not given 2000-01

235. American Indian Mental Health and Education—(Enroll in Education 340X.)
3 units (LaFromboise) not given 2000-01

236. Seminar on Psychophysiology—(Undergraduates register for 124.) Overview of psychophysiology, the empirical study of mind-body relations. Focus is on two response systems (electrodermal and cardiovascular) and applications to lie detection, emotions, and health. Critical thinking skills are emphasized; hands-on lab.

4 units, Win (Gross)

237. Career and Personal Counseling in Culturally Diverse Settings—(Same as Education 234.) Methods of integrating career and personal counseling with clients and counselors from differing backgrounds. Practice with selected assessment instruments. Case studies of bicultural role conflict. Informal supervised experience.

3 units (Krumholz) not given 2000-01

238. Seminar on the Psychology of Gender—See 170. Prerequisite: graduate standing in psychology.
1-3 units (Carstensen) not given 2000-01

240. Language Acquisition I—(Enroll in Linguistics 240.)
4 units, Aut (E. Clark)

241. Language Acquisition II: Lexicon and Syntax in Acquisition—(Enroll in Linguistics 241.)
1-4 units, Win (E. Clark)

242. Conceptual Organization and Development—(Undergraduates register for 144.) Theories and research in conceptual organization and development, critically evaluated. Topics: the acquisition of categories and category terms informed by the general problem of induction, by philosophical and psychological analyses of the nature of human categories (natural kind terms, family resemblances), by recent arguments how the acquisition of category terms is guided by constraints children place on possible word meanings, and by more traditional theories of cognitive development. Prerequisite: graduate standing in psychology or consent of instructor.

1-3 units (Markman) not given 2000-01

243. General Development Seminar—Prerequisite: consent of instructors.
1-2 units, Win (Flavell, Johnson)

244. The Psychology of Aging—Critical examination of theory and research in gerontology. Normal and abnormal changes that occur in biological, cognitive, and psychological aging. Emphasis is on the environmental factors that influence the aging process. Prerequisite: graduate standing in psychology or consent of instructor.

1-3 units (Carstensen) not given 2000-01

245. Social Psychological Perspectives on Stereotyping and Prejudice—Classic and contemporary social psychological approaches to prejudice and stereotyping. Emphasis is on how stereotypes are employed and maintained; and the influence of stereotyping and prejudice on behavior in a variety of domains including education, employment, politics, and law. Limited enrollment.

4 units, Aut (Eberhardt) alternate years, not given 2001-02

246. Perception Lecture Series—Current research topics in perceptual psychology, visual neuroscience, machine vision, and image processing. Speakers from research institutions in the Bay Area and around the world. Prerequisite: 203.

1 unit (Heeger) not given 2000-01

248. Introduction to Test Theory—(Enroll in Education 252.)
3-4 units (Haertel) not given 2000-01

249A. Problems in Measurement: Item Response Theory—(Enroll in Education 353A.)
3 units (Haertel) not given 2000-01

252. Statistical Methods for Behavioral and Social Sciences—(Undergraduates register for 102.) For students who seek experience and advanced training in empirical research. Analysis of data from experimental through factorial designs, randomized blocks, repeated measures; regression methods through multiple regression, model building, analysis of covariance; categorical data analysis through two-way tables. Integrated with the use of statistical computing packages. Prerequisite: 10 or equivalent. (PSE)

1-6 units, Aut (Thomas)

253. Statistical Theory, Models, and Methodology—(Undergraduates register for 103.) Practical and theoretical study of advanced data analytic techniques such as loglinear models, signal detection, meta-analysis, logistic regression, reliability theory, and factor analysis. Prerequisite: 252 or Education 257.

1-3 units (Thomas) not given 2000-01

255. Graduate Seminar: Selected Topics in Personality and Abnormal Psychology—Prerequisite: consent of instructor.
1-3 units, Aut (Horowitz)

257. Supervised Practicum—Satisfies INS requirements for Curricula Practical Training. Relevant experience for graduate students as part of their program of study. Can be repeated for credit. Prerequisites: graduate standing in psychology, consent of adviser.
3-5 units, Aut, Win, Spr, Sum (Staff)

258. Graduate Seminar in Social Psychology Research—For students who are already or are planning to become involved in research on social construal and the role that it plays in a variety of phenomena, notably the origin and escalation of conflict.
1-3 units, Aut, Win, Spr (Zajonc)

259. Emotions: History, Theories, Research—(Undergraduates register for 158 with consent of instructor.) Theoretical and empirical issues in the domain of emotions. The history of emotion theories, current approaches, and the interaction between emotion and cognition.
1-3 units, Spr (Zajonc)

261. Learning and Cognition in Activity—(Same as Education 295.) Introduction to the results and methods of research on learning, understanding, reasoning, problem solving, and remembering, considered as aspects of participation in socially organized activity. Analyses focus is
262. Memory Systems—Recent findings indicate different kinds of memory are mediated by separable neural networks. Different patterns of memory failures are seen in a variety of neurological disorders and in terms of functional consequences for normal memory, such as unconscious learning. Prerequisites: 50, 201, or consent of instructor.
1-3 units (Gabrieli) not given 2000-01

263. Stigma and Marginality—(Undergraduates register for 178.) The perceptions and strategies of the targets of prejudice and discrimination, with emphasis on race and ethnicity. Topics: social perceptions and the judgments of targets, racial identity, behavioral consequences of prejudice and discrimination, and legal/policy implications. Readings from social psychology, African-American studies, sociology, and law. Limited enrollment.
3 units (Eberhardt) alternate years, given 2001-02

264. Selected Topics in Human Learning—Recent empirical and theoretical analyses of verbal learning, learning from text, learning of concepts, and intellectual skills. Emphasis is on information processing theories of memory and retrieval. Readings from recent research journals with topics determined partly by students' interests. Discussion format. Prerequisite: 210 or consent of instructor.
1-3 units, Spr (Bower)

265. Vision and Image Processing—Introduction to image processing through a combination of lectures and hands-on experience in a computer lab. Topics: image representation, sampling and filtering, image segmentation and mosaicing, image warping and morphing, motion analysis, image statistics, restoration, synthesis, and compression.
1-3 units (Heeger) alternate years, given 2001-02

266. Evolutionary Psychology—(Undergraduates register for 168; same as Anthropological Sciences 238.) The natural history of higher-order cognition, using evolutionary theory to evaluate current debates about cognitive architecture. Focus is on analyses relevant to anthropology, emphasizing the relationship between cultural variation and cognitive universals. Enrollment limited to 20.
5 units, Win (Hirschfeld)

267. Graduate Seminar in Personality Research—Can be repeated for credit. Prerequisite: graduate standing in psychology.
1-2 units, Aut, Win, Spr (Gottlib)

271. Applications of Social Psychology—See 156.

272. Special Topics in Psycholinguistics—May be repeated for credit. Prerequisite: consent of instructor.
1-3 units, Win (H. Clark)

275. Graduate Research—Intermediate-level research undertaken with members of departmental faculty. Prerequisite: consent of instructor.
1-15 units (Staff)

276. Computational Neuroscience—Introduction to computational neuroscience: the biophysics of computation, models of vision, audition, learning, and development; self-organizing networks. Emphasis is on theoretical and computational models and how to construct models of neurons and neural systems.
1-3 units (Heeger) alternate years, given 2001-02

277. Seminar on Emotion—(Undergraduates register for 169.) Overview of the scientific study of emotion. Topics: models of emotion, emotion antecedents, emotional responses (facial, subjective, and physiological), functions of emotion, emotion regulation, individual differences, and health implications. Focus is on experimentally tractable ideas.
3 units, Aut (Gross)

278. Culture and Cognition—(Undergraduates register for 179; same as Anthropological Sciences 207.) Theories of culture make strong claims about how people represent the world to themselves and others, particularly claims about perception, memory, and reasoning. The basic anthropological presumptions about cultural knowledge (e.g., that members of different cultures deploy incommensurate world views) in light of recent advances in cognition science, and how well characterizations of thinking and reasoning hold up in a cross-cultural perspective. Enrollment limited to 20.
3 units, Aut (Hirschfeld)

1-3 units (Steele) not given 2000-01

280. Doctoral Research—for dissertation. Prerequisite: consent of instructor.
1-15 units (Staff)

281. Practicum in Teaching—Enrollment limited to students serving as teaching assistants in psychology courses. Can be repeated for credit.
1-4 units, Aut, Win, Spr (Staff)

283. Interdisciplinary Seminar on Conflict Resolution—(Same as Economics 386, Management Science and Engineering 459, Law 611.) Addresses problems of conflict resolution and negotiation from an interdisciplinary perspective. Presentations by faculty and by scholars from other universities.
1-2 units, Win (Alexander, Arrow, Ross, Wilson)

291. Careers in Psychology: Academic and Applied—(Undergraduate students register for 193.) Intended for graduate students and advanced undergraduates who want an opportunity to meet with people who have undertaken academic and nonacademic careers. Speakers discuss their experiences and reflect on their careers and the ways in which their graduate and undergraduate education prepared or failed to prepare them for their careers. (AU)
2 units (Markus, Ross) not given 2000-01

297. Seminar for Coterminal Masters’ Students—Discussion of contemporary issues and student research. Student and faculty presentations.
1 unit, Aut, Win, Spr (Ross)

PUBLIC POLICY PROGRAM

Director: Roger Noll (Economics)
Associate Director: David Brady (Political Science, Business)
Affiliated Faculty: Lucius Barker (Political Science), Donald Barr (Human Biology, Jonathan Bendor (Business), Cori Blacker (Institute for International Studies), Timothy Bresnahan (Economics), John Cogan (Hoover Institution), Andrew Creighton (Sociology), Gregory Dees (Business), Morris Fiorina (Political Science, Hoover Institute), Judith Goldstein (Political Science), Lawrenceoulder (Economics), Mark Hlatky (Health Research and Policy), Daniel Kessler (Business), Michael Kirst (Education), Anne Krueger (Economics), Thomas Macurdy (Economics), Mark McClellan (Economics), Robert McGinn (Science, Technology, and Society), Milbrey McLaughlin (Education), Terry Moe (Political Science), Susan Olzak (Sociology), Leonard Ortolano (Civil and Environmental Engineering), A. Mitchell Polinsky (Law), Nathan Rosenberg (Economics), Geoffrey Rothwell (Economics), Debra Satz (Philosophy), Myra Strober (Education), James Sweeney (Management Science and Engineering), Barton Thompson (Law), Nancy
Government plays an important, ubiquitous role in contemporary society. Moreover, the growing complexity of public policies, the political processes that give rise to them, and the organizations that implement them have created a need in government, business, and the nonprofit sector for people who understand how government operates. The Public Policy Program provides students the foundational skills and institutional knowledge necessary for understanding the policy process, and provides an interdisciplinary course of study in the design, management, and evaluation of public sector programs and institutions. The major in Public Policy is useful as preparation for employment as an analyst in government agencies or business, as a foundation for postgraduate professional schools in business, education, law, and public policy, and as preparation for graduate study in the social sciences, especially economics, political science, and sociology.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The core courses in the Public Policy Program develop the skills that are necessary for understanding the political constraints faced by policy makers, assessing the performance of alternative approaches to policy implementation, evaluating the effectiveness of policies, and appreciating the sharp conflicts in fundamental human values that often animate the policy debate. After completing the core, students apply these skills by focusing their studies in one of several areas of concentration. The areas of concentration may deal with a specific field of public policy, with types of institutions, or with deeper development of the tools of policy analysis. A list of recommended courses for each concentration is available in the Public Policy Program office. Areas of concentration are:

- Advanced Methods of Policy Analysis
- Business Policies
- Design of Public Institutions
- Development and Growth Policies
- Education
- Environment, Resources, and Population
- Health Care
- International Policies
- Law and the Legal System
- Science and Technology Policy
- Social Policy: Discrimination, Crime, Poverty
- Urban and Regional Policy

Completion of the program in Public Policy requires 83 units of course work.

1. Forty-five units of prerequisite courses: Political Science 1 or 10; Economics 1, 50, 51, 102A, 102B; Sociology 160 or Management Science and Engineering 180; and either Mathematics 19 and 20, or 41. In addition, students may be required to take Economics 50M before enrolling in Economics 50, and are encouraged to take Mathematics 42 and 51, and at least one course in linear algebra.

2. The 25-unit sequence of 5-unit core courses, which students should plan to complete by the end of their junior year (see below for descriptions 101-105). To satisfy the core requirement in Organizations, students may take Public Policy 102A or 102B, and to satisfy the core requirement in Philosophy, students may take Public Policy 103A or 103B.

3. During the senior year, majors must complete 15 units of course work in a problem-focused area. The 15 units of post-core course work must be approved by an adviser, who is appointed when the student selects an area of concentration. This usually is done midway through the junior year, and must be done no later than the end of the second week of Autumn Quarter in the senior year.

4. Seniors are required to participate in one quarter of the Senior Seminar (Public Policy 200). Majors also must submit at least one research paper during the senior year and present it before the Senior Seminar. The senior paper may be a term paper for either the senior seminar or another course, or an honors thesis.

5. A maximum of 10 units may be taken on a satisfactory/no credit basis in the prerequisite courses for the Public Policy core. All courses required for Public Policy majors must be taken for a letter grade.

6. Students must complete the Public Policy core and their concentration area courses with a grade point average (GPA) of 2.0 or higher.

7. To become a major in Public Policy and to be nominated for the A.B. degree, students must complete an application, available in the Public Policy Program office. For additional information, drop by or phone (650) 723-3452.

The Public Policy Program offers a two-quarter course sequence to prepare students for making effective academic use of an internship (Public Policy 182A and B). Students may also participate in the Integrated Scholar Intern Program, combining directed reading and research with an internship. Information about this program is available in the Public Policy Program office.

MINORS

The Public Policy Program offers a minor that is intended to provide students with interdisciplinary training in applied social sciences. Students who pursue the minor are required to take at least three of the five core courses, and a total of 35 units in Public Policy and its supporting disciplinary departments. Because University rules prohibit double-counting courses, the requirements for a minor differ according to the student's major requirements.

For students whose major department or program requires no courses in economics, political science, or sociology, the requirements for a Public Policy minor are:

- Course No. and Subject
- Units
- Economics 1, 50, 51; Public Policy 104
- 20
- Public Policy 103
- 5
- Either of the following sequences:
- Political Science 1 or 10 and Public Policy 101; or
- Sociology 160 or Management Science and Engineering 180 and
- Public Policy 102
- 10
- For students who are Economics majors or who satisfy a major requirement by taking Economics 51, but no courses in political science, the requirements for a Public Policy minor are:
- Political Science 1 or 10; Public Policy 101
- 10
- Public Policy 103
- 5
- Public Policy 104
- 5
- Public Policy 105
- 5
- Sociology 160 or Management Science and Engineering 180 and
- Public Policy 102
- 10
- For students who are Political Science majors or who satisfy a major requirement by taking either Political Science 1 or 10, but no courses in Economics, the requirements for a Public Policy minor are:
- Economics 1, 50, 51; Public Policy 104
- 20
- Public Policy 103
- 5
- Sociology 160 or Management Science and Engineering 180 and
- Public Policy 102
- 10
- For Sociology majors, the requirements for a Public Policy minor are:
- Economics 1, 50, 51; Public Policy 104
- 20
- Political Science 1 or 10; Public Policy 101
- 10
- Public Policy 103
- 5
- For students who major in another interdisciplinary program (such as International Relations) and who satisfy major requirements by taking both Economics 51 and Political Science 1 or 10, the requirements for a Public Policy minor are:
- Economics 102B; Public Policy 105
- 10
- Public Policy 101
- 5
- Public Policy 103
- 5
- Public Policy 104
- 5
- Sociology 160 or Management Science and Engineering 180 and
- Public Policy 102
- 10
HONORS PROGRAM

The Public Policy Program offers students the opportunity to pursue honors work during the senior year. In order to graduate with honors in Public Policy, a student must:

1. Apply for admission to the honors program no later than the end of the second week of Autumn Quarter of the senior year.
2. Complete the requirements for the A. B. in Public Policy and achieve a grade point average (GPA) of 3.3 in the following courses: the Public Policy core, the student's concentration area courses, the Senior Seminar, and Public Policy 199 (senior research). Courses not taken at Stanford are not included in calculating the GPA.
3. Enroll in at least 8 but no more than 15 units of Public Policy 199 during the senior year and receive a final grade on the senior thesis of at least a 'B+'.

Students who intend to pursue honors work should plan their academic schedules so that most of the core courses are completed before the beginning of the senior year, and all of the core and concentration courses are completed by the end of Winter Quarter of senior year. This scheduling gives students both the time and the necessary course background to complete a senior research project in Spring Quarter. In addition, juniors who may wish to pursue a senior thesis are encouraged to enroll in Public Policy 197 (Junior Honors Seminar) during Winter Quarter. This course focuses on developing a research plan and the research skills necessary to complete a thesis.

To apply, a student must submit a completed application to the Public Policy Program office with a brief description of the thesis. The student must obtain the sponsorship of a faculty member who approves of the thesis description and who agrees to serve as a thesis adviser. Students intending to write a thesis involving more than one discipline may wish to have two advisers. To be admitted to the honors program, students must:

1. Submit a completed application for honors work to the Public Policy Program office by the end of the second week of Autumn Quarter of the senior year.
2. Achieve a GPA of at least 3.3 in Public Policy courses by the end of the junior year.

The honors thesis must be submitted to both the thesis adviser and the Public Policy Program office. Graduation with honors requires that the thesis be approved by both the adviser and the Director of the Public Policy Program. The role of the director is to assure that the thesis deals with an issue of public policy and satisfies the standards of excellence of the program. However, the grade for the honors thesis is determined solely by the adviser. The thesis adviser sets the deadlines for receiving the final draft of the thesis; the director sets the deadline for theses to be considered for University and department awards. In order to graduate with honors at the Spring commencement, a student must submit a final bound copy of the thesis to the Public Policy Program office no later than Friday, June 1. In order to be considered for awards given to outstanding senior theses, a student must submit a copy of the thesis to the Public Policy Program office no later than Wednesday, May 16.

Members of the core faculty in Public Policy are listed above and are available to provide assistance in selecting a senior thesis topic. For additional information, contact the Public Policy Program office.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

3 units, Spr (Noll)

101. Politics and Public Policy—(Same as Political Science 101P.) The domestic policy-making process, emphasizing how elected officials, bureaucrats, and interest groups shape government policies in various areas including tax, environmental, and social-welfare policy, given their goals and available tactics. How public policies are formulated and implemented. The results of this process using equity and efficiency criteria. Prerequisite: Political Science 1 or 10.
5 units, Spr (Brady)

102A. Organizations and Public Policy—(Same as Sociology 166/266.) Concepts and methods for analyzing the influence of organizations on the setting and implementation of public policy. Varying conceptions of organizations as corporate actors and as social contexts. The roles of organizations in relation to public policy; organizations as decision makers and problems solvers, as change agents, and as clients. Prerequisite: Sociology 160 or Management Science and Engineering 180.
5 units, given 2001-02

102B. Organizations and Public Policy—Analysis of public organizations, stressing problems of effective management and incentives in a non-market environment. Prerequisite: Sociology 160 or Management Science and Engineering 180.
5 units, Win (Bendor)

103A. Introduction to Political Philosophy/Theory—(Same as Philosophy 30.) Critical introduction to issues of state authority, justice, liberty, and equality, approached through major works in political philosophy. Topics: human nature and citizenship, the obligation to obey the law, democracy and economic inequality, equality of opportunity and affirmative action, religion and politics. Readings: Locke, Rousseau, Mill, Marx, Rawls, and some cases of practical application, including Supreme Court cases. GER:3a (DR:8)
5 units, Aut (Satz)

103B. Ethics and Public Policy—(Same as Science, Technology, and Society 110.) Ethical issues in science- and technology-related public policy conflicts. Develops the capacity for rigorous critical analysis of complex, value-laden policy disputes. Topics: the nature of ethics and morality; the nature of and rationales for liberty, justice, and human rights; and the use and abuse of these concepts in recent and current policy disputes. Cases from: biomedicine, environmental affairs, the technical professions, communications, and international relations. If there is sufficient student demand, one of the weekly seminar sections may be offered in French. GER:3a (DR:8)
5 units, Win (McGinn)

104. Economic Analysis I—(Same as Economics 150.) The relationship between microeconomic analysis and public policy making. How economic policy analysis is done and why political leaders regard it as useful but not definitive in making policy decisions. Economic rationales for policy interventions, methods of policy evaluation and the role of benefit-cost analysis, economic models of politics and their application to policy making, and the relationship of income distribution to policy choice. Readings: theoretical foundations of policy making and policy analysis, and applications to the adoption and implementation of programs in several areas. Prerequisite: Economics 51. (WIM)
5 units, Win (Noll)

105. Quantitative Methods and their Application to Public Policy—Applications of statistical methods, rather than methodology per se. Risk assessment in the evaluation of biohazards and medical techniques and technologies; comparisons of such information-gathering techniques as surveys, experiments, or simulation studies; methods of expressing and evaluating uncertainty; and the interpretation of such quantitative techniques of data analysis as regression. Prerequisite: Economics 102A, 102B.
5 units, Spr (Rothwell)

160. Comparative West European Institutions—(Same as International Relations 160, Political Science 120A.) How institutions shape politics and policies in Western Europe. Electoral laws, parliamentary systems, and government institutions at the national level influence the
quality and nature of representation, political competition, and policy outcomes. Institutional developments at the subnational level and within the European Union challenge the domestic politics and policies of the European nation states.

5 units, Aut (Alter)

161. Comparative Political Economy of Post-Socialist Transitions—(Same as International Relations 161, Political Science 121A.) The post-Socialist economic and political transitions ongoing in Eastern Europe and the former Soviet Union, investigating attempts to build market economies and democratic governments. The politics of constitutional choice and variation in reform strategies and outcomes across the cases. Prerequisites: Economics 1, Political Science 1 or 10.

5 units, Aut (Alter)


3 units, Win (Gonzalez)

182A,B. Policy Making and Problem-Solving at the Local and Regional Level—In an era of devolution and calls for “integrated service-provision,” much innovative policy formulation and implementation takes place at the local and regional level. The theory and practice of these processes, focusing on Silicon Valley as a case study. The social, institutional, and organizational landscape within metropolitan regions, and theories of metropolitan politics; alternative theories of community and economic development; collaboration as an approach to policymaking and problem-solving. Weekly seminars; a speaker series; and internships with collaborative community and economic development efforts in Silicon Valley. Enroll both quarters. Prerequisite: consent of instructor after formal application.

5 units, Win, Spr (Stanton)

185. Managing Public Policy: Seminar—The role of public administration in contemporary government. Major issues: administrative structure, control, relations with other branches of government, the problems of internal organization and management, methods of innovation and change, budgeting, and personnel. Enrollment limited to 20. Prerequisite: Political Science 1 or 10.

5 units, Aut (Printup)

186. Social Security and Entitlements, Current Policy and Reform Debate—Limited to advanced undergraduates. Focus is on the nature, issues, and reform options for Social Security and related entitlements, examining fiscal policy implications, differences between public entitlements and private means of preparing for retirement, ideological debate, and politics. Prerequisites: American national government, public policy, public finance, or macro-economics.

3 units, Spr (Koitz)

191. Business Skills for the Social Sector—Recommended for students taking 192. Introduces core concepts in marketing, financial decision making, organizational effectiveness, operations management, and strategy. Focus is on the adaptation of these concepts for use in the social sector, exploring the limits of using business-based methods to serve social objectives. Conceptual articles and some case studies. Prerequisites: Economics 1, junior or senior standing.

4 units, Win (Dees)

192. Social Entrepreneurship—The search for innovative responses to social needs, the role of private initiatives, for-profit and not-for-profit, and the challenges associated with these initiatives. Theoretical issues: defining the social good and assessing the role of market forces, philanthropy, and government. Practical issues: recognizing specific opportunities for social improvement, forming an enterprise that responds to those opportunities, developing organizational and funding strategies, evaluating performance, managing the enterprise, and creating sustained positive impact. Readings: business school cases and a range of theoretical and practical articles. Prerequisites: Economics 1, junior or senior standing.

5 units, Spr (Dees)

194. Technology Policy—The evolution of U.S. technology policy and the way in which policy is made. Students rigorously analyze technology policy issues. Topics: federal technology policy before and after WWII, the debate over using R&D programs and other measures to promote economic growth and competitiveness, the impact of federal policy on the development of the Internet and biotechnology, and nuclear waste disposal and genetic privacy as examples of controversies over the environmental and social impact of technological activities. Prerequisites: Economics 1, Political Science 1 or 10.

5 units, Win (Windham)

195. Business and Public Policy—The multi-faceted relationships between business, government, and interest groups, with emphasis on companies and interest groups as strategic actors in the “nonmarket environment.” Companies attempt to shape public policy through government processes and international politics; interest groups attempt to shape public policy through government processes and by exerting direct influence on businesses; politicians attempt to mediate conflicts of interest between and among businesses and interest groups. Each relationship transcends the conventional view of a business as an exclusively or predominantly market focused entity that takes as given government actions and ignores interest groups and their collective actions. Modules: media and private collective action, business strategies in government arenas, international business and the nonmarket environment, and corporate responsibility and ethics.

5 units, Spr (Staff)

196. The Political Economy of the Federal Budget—Applies the tools of economic analysis to study how the federal government makes its budgetary decisions. The factors that have contributed to the growth in federal spending, taxation, and the national debt; congressional and executive branch budget processes and their effects on government policymaking; spending programs (Social Security, Medicare, welfare, and infrastructure programs). Prerequisites: Economics 51, 52 (Economics 52 may be taken concurrently).

5 units, Win (Cogan)

197. Junior Honors Seminar—Primarily for students who expect to write an honors thesis. Weekly sessions discuss writing an honors thesis proposal (prospectus), submitting grant applications, and completing the honors thesis. Readings focus on writing skills and research design. Students select an adviser, outline a program of study for their senior year, and complete a prospectus by the end of the quarter. Sophomores working on their theses also may enroll and present their research to the seminar participants. Seniors are required to make substantial progress on their thesis by the end of the quarter.

3 units, Win (Rothwell)

198. Directed Readings in Public Policy

1-5 units (Staff)

199. Senior Research

1-15 units (Staff)

200A,B,C. Senior Seminar—Designed to give Public Policy students the opportunity to make oral presentations and to write a seminar-length paper on a topic in public policy. Topic and methods of analysis used are determined by student in consultation with instructor. A limited number of lectures and seminars deal with the question of how to conduct "good"
research in public policy. Prerequisites: completion of core courses in Public Policy or consent of the instructor.

200A. 3 units. Aut (Wallsten)
200B. 3 units. Win (Wallsten)
200C. 3 units. Spr (Wallsten)

205. European Integration—(Same as International Relations 205, Political Science 219A.) Seminar on the political and economic factors shaping European integration from its conception to the present day. The evolution of the European Union and its governing institutions through the lens of several policy areas. Agricultural, regional, monetary, regulatory, and foreign policy. The debates about democratic accountability, the future of the European Union, and the interplay between EU institutions and the domestic political arenas of member states. Prerequisites: Economics 1, Political Science 1 or 10 or consent of instructor.

5 units. Win (Alter)

RELIGIOUS STUDIES

Emeriti: (Professors) René Girard, Edwin M. Good, Van Harvey, David S. Nivison
Chair: Carl Bielefeldt, Robert Gregg (Autumn)
Professors: Carl W. Bielefeldt, Arnold M. Eisen (on leave), Bernard R. Faure, Robert C. Gregg, Gregory Schopen, Thomas Sheehan, Lee Yearley
Associate Professor: Hester G. Gelber
Assistant Professors: Rudy V. Busto, Charlotte Ronfroid, Brent Sockness
Lecturers: Linda Hess, Jacqueline Armijo-Hussein
Acting Assistant Professor: Barbara Pitkin
Consulting Associate Professor: Aviv Bergman
Visiting Associate Professors: Judith Boltz, Ebrahim Moosa
Acting Instructor: Adam Chau

The purpose of Religious Studies is to understand and interpret the history, literature, thought, and social structures of various religious traditions and cultures. The department offers courses at several levels, described below.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The general requirements for an A.B. in Religious Studies are 60 units of course work in the department (no more than 10 units of which can be taken satisfactory/no credit), including 9 to 15 units in introductory courses (numbered 1-89). At least two introductory courses must be in diverse religious traditions (see below). At least 40 units are to be taken in courses numbered above 100, including no fewer than three seminars numbered above 200. All majors are required to take 290, Majors Seminar. Up to 10 units of directed reading may count toward the major.

In meeting these requirements, a student is expected to structure a coherent program of study in consultation with his or her adviser. This may be done in a number of ways. The student may choose to concentrate in one of three areas: religious traditions; ethics and philosophy of religion; or religion, culture, and comparative studies. Religious traditions consists of three sub-fields: East Asian religions, Judaism, and Christianity. Alternatively, the student may construct a self-designed concentration across these (or other) areas, again in consultation with the adviser.

The student is expected to take a minimum of 25 units in the area of concentration. Relevant courses listed in one area may, with the written consent of the Undergraduate Director, be counted in another. Approved courses offered by other departments may also be counted.

MINORS

The minor requires at minimum seven courses of 3 or more units for a minimum of 30/maximum of 36 units of graded work. Students must complete two introductory courses (numbered 1-89), at least two topics in religion courses (numbered 101-189) and at least one seminar (numbered 201-289). Remaining units must be taken in courses numbered 101 and above. One course in directed reading (199) may count towards the minor, and students may petition for other Stanford courses to fulfill minor requirements. Students are strongly encouraged to focus their program of study in one of the established department areas of concentration, but may also design the minor to supplement their major. Examples of minor concentrations are available from the department administrator. Minors must take courses from at least two Religious Studies faculty members. Students must declare the minor no later than the last day of the quarter two quarters before degree conferral.

It is possible for minors to write a senior essay in Religious Studies, but only with the consent of the Undergraduate Director and the student’s major adviser. Students writing the senior essay are required to complete 197 (Senior Essay) in addition to the minor course requirements, and should plan on one directed reading course as part of their program requirements (199).

SENIOR ESSAY/HONORS

Majors in Religious Studies (RS) are encouraged to write a senior essay in Religious Studies. The essay allows students to apply knowledge and skills learned in the classroom to a topic of personal interest. It also provides a focused research experience under the tutelage of a Religious Studies faculty member, thereby offering students a chance to improve research and writing skills indispensable to graduate work in the humanities and useful in a wide variety of professions.

The essay may be on any approved topic in Religious Studies. Students should begin conversations about the senior essay with Religious Studies faculty and the Undergraduate Director soon after declaring the Religious Studies major. While the bulk of the essay is generally written during the senior year, students are advised to begin conceptualizing a project at the end of the junior year in order to take advantage of summer research opportunities. Students unsure about which faculty member would be most knowledgeable in the area of interest should ask the undergraduate assistant in the department for a copy of the leaflet, Religious Studies at Stanford. A proposal for the senior essay, consisting of a completed application form, a copy of the transcript, and a one-to-two page description of the topic signed by the prospective essay adviser, should be submitted by the end of Spring Quarter of the junior year, and in no case later than the end of third quarter prior to graduation. The application is then reviewed by the Undergraduate Director who either approves the project or requests resubmission with revisions.

Students must take 197 (Senior Essay) for a letter grade and 3 to 5 units in the senior year while writing the thesis. These units are in addition to the total number of units (60) required for successful completion of the major. Students are allowed up to 10 letter grade units in senior essay. Essays-in-progress are also discussed in the Majors Seminar, 290.

Senior essays of exceptional merit are submitted to the Religious Studies faculty for honors consideration. There is no honors essay in Religious Studies; rather, all senior essays are eligible for receiving the honors distinction if the essay receives a grade of “A” or “A-.” Those who successfully earn honors are acknowledged publicly during the department’s commencement exercise, and the honors distinction is also recorded on the final University transcript.

Further details and guidelines for the senior essay are available from the department undergraduate assistant.

MAJOR IN RELIGIOUS STUDIES AND PHILOSOPHY

The departments of Religious Studies and Philosophy jointly nominate for the A.B. students who have completed a major in the two disciplines. See a description of this joint major under the “Philosophy” section of this bulletin, or in the guidelines available from the Undergraduate Director of either department.
GRADUATE PROGRAMS

MASTER OF ARTS

University regulations pertaining to the A.M. are listed in the “Graduate Degrees” section of this bulletin. The following requirements are in addition to the University’s basic requirements.

The student completes at least 36 units of graduate work at Stanford beyond the A.B. degree, including a required graduate seminar (304A or B). Residence may be completed by three quarters of full-time work or the equivalent.

The student’s plan of courses is subject to approval by the Graduate Director. No field of specialization is expected, but students may focus work in particular areas. Advanced and graduate courses in other departments may be taken. No thesis is required; a thesis, if elected, may count for as many as 9 units.

Each student demonstrates reading knowledge of at least one foreign language.

DOCTOR OF PHILOSOPHY

University regulations regarding the Ph.D. are found in the “Graduate Degrees” section of this bulletin. The following requirements are in addition to the University’s basic requirements.

Residence—Each student completes three years (nine quarters) of full-time study, or the equivalent, in graduate work beyond the A.B. degree, and a minimum of 72 units of graduate course work (excluding the dissertation).

Field of Study—The Ph.D. signifies special knowledge of a field of study and potential mastery of an area of specialization within it. The faculty of the department has established certain fields of study in which the department’s strengths and those of other Stanford departments cohere. They are: East Asian religions, Judaic studies, Western religions, and modern Western religious thought. Students who wish to specialize in other fields must obtain early approval by the faculty.

Stages of Advancement—The three stages through which the student advances to the degree are: (1) in the first two years, the student refines an area of specialization within the chosen field of study in preparation for candidacy; (2) after attaining candidacy, the student concentrates on the area of specialization in preparation for the qualifying examination; (3) the student writes a dissertation and defends it in the University oral examination.

Languages—Each student demonstrates a reading knowledge of at least two foreign languages, including French or German. Each student also demonstrates reading knowledge of other ancient or modern languages necessary for the field of study, area of specialization, and dissertation topic.

Courses—Each student satisfactorily completes the two graduate seminars (304A and B) before the candidacy decision. Other courses are taken with the approval of a faculty adviser in consideration of the student’s field of study.

Candidacy—At the end of each academic year, the department’s faculty recommends second-year students for candidacy on the basis of all relevant information, and especially on the student’s candidacy dossier which includes the approved declaration of an area of specialization, certification for one foreign language, and two substantial papers written for courses during the previous two years.

Teaching Internship—At least one teaching internship under the supervision of faculty members is undertaken at a time negotiated with the Graduate Director. Students receive academic credit for the required internship, which is a project of academic training and not of employment.

Qualifying Examination—To qualify for writing a dissertation, the student must successfully pass a comprehensive examination in the chosen field and the area of specialization. The student must complete the second language requirement before taking qualifying examinations.

Dissertation—The dissertation contributes to the humanistic study of religion and is written under the direction of the candidate’s dissertation adviser and at least two other members of the Academic Council. The University oral examination is a defense of the completed dissertation.

Ph.D. MINOR IN RELIGIOUS STUDIES

Candidates for the Ph.D. in other departments may select a Ph.D. minor in Religious Studies. The minor requires at least 24 units in Religious Studies at the 200 level or above. Four of the 24 units should be in “Theories and Methods.”

JOINT PH.D. IN RELIGIOUS STUDIES AND HUMANITIES

Religious Studies participates in the Graduate Program in Humanities leading to the joint Ph.D. in Religious Studies and Humanities, described in the “Interdisciplinary Studies in Humanities” section of this bulletin.

COURSES

Course levels:

1-89 Introductory (4 units)

101-189 Undergraduate Lecture Courses (4 or 5 units)

197-199 Undergraduate Directed Reading (variable units)

201-290 Undergraduate Seminars (4 or 5 units)

299 Graduate Directed Reading (variable units)

301-399 Graduate Seminars, Research, and Teaching (variable units)

INTRODUCTORY

1. Introduction to Religion—Cross-disciplinary approach to the beliefs, practices, experiences, and institutions that, to individuals of diverse epochs and cultures, have comprised the phenomenon called religion. Issues: prophets and founders; God and the gods; scriptures and their interpretation; annual and life-cycle rituals; faith, reason, and mysticism; the impact(s) of modernity. GER:3a (DR:8)

4 units (Gregg) not given 2000-01

3N. Stanford Introductory Seminar: In Search of a Religion—Preference to freshmen. The problems of research in the humanities: one scholar’s struggle (mine) to come to terms with the fact that he cannot find the object (religion, i.e., Indian Buddhism) that he is supposed to be studying. Religious people say or write things, they do things, and they make things. What they say often does not correspond with what they do; it is not clear which actually represents what is called “religion.” Focus is on the problem of recovering “Indian Buddhism” but is applicable to the histories of any religion. Readings: Buddhist literary sources, art, historical and archeological sources, and modern attempts to impose sense on them. GER:3a (DR:8)

3 units, Aut (Schopen)

4N. Stanford Introductory Seminar: The Creation of Woman—Eve, Pandora, and their Interpreters—Eve and Pandora in diverse cultural settings and religious traditions. The biblical story of human creation and its Greek equivalent, the myth of the creation of Pandora (by Hesiod and in later Roman literature); contemporary commentaries. The ways the major stories of Eve and Pandora have been used, interpreted, retold, and readapted. Readings: the New Testament, early rabbinic commentaries, the Qur’an, Kabbalah, Milton, and contemporary interpretations by Jewish and Christian feminists, placed in historical and intellectual context. The ideas about gender and women’s roles that they reflect and attempt to influence. GER:3a (DR:8)

3 units, Win (Fonrobert)

8. Religion in America—Interdisciplinary introduction to the diversity of religious communities in the U.S. Important religious events, figures, and developments in American religions. Topics: indigenous worldviews, popular religions, civil religion, religion and social conflict, and new religious expressions. GER:3a,4b (DR:8,3)

4 units, Spr (Busto)

11. Religious Classics of Asia—Important texts from S. Asia, including discussion of the idea of text; culture-specific ways of receiving and interpreting texts; interactions of such categories as oral and written, classical and folk, elite and popular in Indian traditions. Texts: Upanisads, Sattipathana Sutta, Bhagavad Gita, Ramayana, Devi Mahat...
12. Religions of India—The history of religious traditions in the Indian subcontinent (including indigenous or “tribal” religions, Hinduism, Buddhism, Jainism, Islam, Sikhism, and Christianity), representative texts and practices, and some issues of religious identity and conflict in modern India. GER:3a,4a (DR:2 or 8)
   4 units, Win (Hess)

14. Introduction to Buddhism—The development of the complex clusters of rituals, practices, and world-views called “Buddhism.” Focus is on these clusters as they emerged and were constructed in India. The fate of radical religious ideals in conventional worlds. GER:3a,4a (DR:2 or 8)
   4 units, Aut (Schopen)

15. The Hebrew Bible
   4 units, not given 2000-01

18. Zen Buddhism—Introduction to classical Zen thought in China, its background, origins, and development. GER:3a,4a (DR:2 or 8)
   4 units, Spr (Bielefeldt)

   4 units, not given 2000-01

23. Introduction to Judaism—The historical development of Jewish religious thought and practice, from the biblical period to the present. Various kinds of texts reflecting that development: scriptural, liturgical, midrashic, legal, historical, and philosophical. The Sabbath, and yearly festivals and sacred days. GER:3a (DR:8)
   4 units, Win (Fonrobert)

24. Introduction to Christianity—The historical development of Christian religious thought and practice from Jesus to the present. Emphasis is on the formation of Christianity’s major teachings and their transformation and diverse expressions in the medieval, reformation, and modern periods. Readings focus on primary texts. GER:3a (DR:8)
   4 units, Aut (Pitkin)

25. Introduction to New Testament Literature—The more important writings in the New Testament (and several non-canonical early Christian works) and recent scholarly treatment of this literature. Emphasis is on the historical and social dynamics which influenced the New Testament’s leading ideas, including its differing portraits of Jesus and its several understandings of divine action.
   4 units (Gregg) not given 2000-01

27. Introduction to Islam—The beginning of Islam as a religious tradition and its unfolding into a world religion. Focus is on the history of the founder and the elements that constitute a Muslim world view: beliefs, rituals, scripture, and prophecy. Some tools and insights to understand contemporary Islam. GER:3a (DR:8)
   4 units (Moosa) not given 2000-01

29. Imagining Jewish Civilization—(Same as History 88.) Interdisciplinary introduction to the various forms of Jewish self-expression, literature, religion, and history from the Biblical period to the present. Topics: power and powerlessness, conflicting notions of the divine, evil, beauty, community, gender, and learning through the ages. Guest lectures, films, reading of primary and secondary texts.
   5 units (Eisen, Zipperstein) not given 2000-01

30. Modern Christian Theology: Issues and Problems—Challenges to Christian belief posed by modernity (e.g., the historical reliability of Christian scriptures, the rise of secularism as a world view, the historicization of human thought and culture, the quest for political justice and liberation, the rise of protest atheism, the presence of “other” religions, the meaning of religious discourse in a scientific age) and responses to these challenges by classic and contemporary Christian thinkers since the Enlightenment. Specific issues and figures rotate. GER:3a (DR:8)
   4 units, Spr (Sockness)

42. Philosophy of Religion—Classic and modern questions in the philosophy of religion are traced through Western and Eastern traditions: the coherence of theism, relativism, verification and ethics of belief, and implications of science. Readings from traditional and modern texts.
   GER:3a (DR:8)
   4 units (Gerber) not given 2000-01

53. Jews and Judaism in America—The interaction between the character of the American Jewish community and the forms of Judaism developed in this country is examined against the background of American ethnicity. Historical, literary, sociological, and theological materials. GER:4b (DR:3)
   4 units (Eisen) not given 2000-01

55. Introduction to Chinese Religions—Confucianism, Daoism, Buddhism, and the interchange among these belief systems and institutions. Set against the background of Chinese history, society, and culture, with attention to elite and popular religious forms.
   GER:3a (DR:8)
   4 units (Faure) not given 2000-01

58. Religion and Society in Traditional China—The late medieval period in China, especially how questions of authority marking the political and socio-economic transformations of the Song period were reflected in changing religious perspectives and practices.
   5 units, Aut (Bolitz)

65. Introduction to Christian Ethics—The concepts, sources, and methods employed in the ethical reflections of major Christian thinkers from traditional to contemporary (e.g., Augustine, Aquinas, and Stanley Hauerwas). Their understandings of society, the meaning of our lives, the kind of people we ought to be, and how we make practical moral judgments.
   4 units, not given 2000-01

77. God in the Modern and Postmodern World—The dialogue of philosophy and religion from Kierkegaard’s leap of faith to Heidegger’s pious agnosticism, and beyond.
   4 units (Sheehan) not given 2000-01

80. Introduction to Rabbinic Culture—The genres of rabbinic culture and the issues which have shaped its worldview in different times and places. Selections from rabbinic texts (in English translation): midrash, Mishna, Talmud, codes, and responsa. The legitimacy of rabbinic authority and its institutions, the value of oral Torah and discipleship, the nature and place of dissent, diaspora vs. Israel, perceptions of other religions and cultures, the tension between family-life and study, the status of women, the relationship between custom and law, the expansion of the realm of norms, the challenge of modernity.
   GER:3a (DR:8)
   4 units, Win (Fonrobert)

UNDERGRADUATE LECTURES

ASIAN RELIGIONS

105. Popular Religion in Contemporary East Asia—Survey of modern East Asian societies and cultures (mainland China, Taiwan, Japan, Korea, Hong Kong, Vietnam, Malaysia), exploring them through the lens of popular religion. Popular religious beliefs and practices: fengshui, shamanism, mediumism, spirit possession, divination, magical healing, exorcism, and self-mortification. Anthropological themes and methods are used and critiqued.
   4-5 units, Win (Chau)
113. Introduction to the Daoist Religion—The major schools and practices of Daoism, China's indigenous higher religion. The historical framework, with the texts of Laozi and Chuangtzu, cosmology, and a variety of beliefs and practices of various periods. Modern Daoist liturgy and its relationship with popular religion.
4 units, not given 2000-01

116. Japanese Buddhism—The history and teachings of Buddhism in Japan, emphasizing the early and medieval periods. GER:3a (DR:8)
5 units, Win (Faure)

117. Syncretism and Sectarianism in Chinese Buddhism—Dialectical relationships between sectarian and syncretic tendencies, conservative and subversive elements, and orthodoxy and heterodoxy in the development of Chinese Buddhism. Prerequisite: consent of instructor.
3 units (Faure) not given 2000-01

118. Ritual in East Asian Buddhism—Rituals and symbolic representations of the relationship between the sacred and profane in E. Asian religious traditions.
4 units (Faure) not given 2000-01

119. Gandhi and Non-Violence—M. K. Gandhi, widely known as “Mahatma” (saint or holy man), is one of the most influential figures of the 20th century and is especially associated with the development of ahimsa (nonviolence) as a political force and social ideal. Violence/nonviolence in Hinduism, Buddhism, and Jainism. Gandhi, his life, ideas, and influence, through his own autobiography and writings, and through writings by others.
GER:3a (DR:8)
4 units, not given 2000-01

5 units, Win (Faure)

136. Buddhist Yoga—Introduction to Buddhist models of spiritual practice, with emphasis on issues in the interpretation of the contemplative path. Limited enrollment.
4 units (Bielefeldt) not given 2000-01

150. Mahayana Buddhism—Introduction to the Lotus school of Mahayana; its Indian sources, Chinese formulation, and Japanese developments.
GER:3a (DR:8)
5 units (Bielefeldt) not given 2000-01

151. Indian Religious Poetry—Between the 7th and 17th centuries, splendid devotional poets flourished in vernacular languages throughout India, associated with a movement called bhakti, the fervent devotion to a personal God. The major bhakti poets in translation; the skills needed to read the poetry; representations of God (Shiva, Vishnu, Krishna, Rama, Kali, Allah, the no-form God); sectarian formations and histories started by saint-poets; the performance of the poetry as song and dance.
GER:3a (DR:8)
5 units, Spr (Hess)

156. Religious Lives of South Asian Women—Emphasis is on religious texts and practices in which women are the main actors and the principal or only participants. The process of making “women’s spaces” and the circumstances in which women experience and exercise their own agency. The boundaries of these spaces, the implied contrasts with mainstream traditions, and constructions of gender from various perspectives. Hindu, Muslim, Sikh, and Jain communities. Student research projects on any religious tradition in any S. Asian country.
4 units, not given 2000-01

161. Modern Jewish Thought: Political-Theological Engagements—How Jewish and non-Jewish thinkers from Spinoza to the present have situated Judaism with, in, or against modern culture and society. What is the value of modernity from a Jewish perspective rooted in ancient traditions and communities? What is the value of Judaism when judged by principles and practices such as technical progress and liberal democracy? Readings from Spinoza, Mendelssohn, Kant, Marx, Nietzsche, Ahad Ha’am, Rosenzweig, Horkheimer, Levinas, Strauss.
5 units, Spr (Kaplan)

170. Sex and Gender in East Asian Religions—How Asian religions (Buddhism and Taoism) dealt in theory and practice with the questions of sex and gender. The normative views found in each tradition; the models transmitted through mythology, ritual, and hagiography; the monastic definition of sexual norms and transgression, and of legitimate and illegitimate sexuality; the various conceptions of the body and of desire, monastic discipline, and renunciation; the ritualization of sex and gender and the construction of a gendered religious experience through the Buddhist and Taoist discourses on embryology; and the role of women in such predominantly male traditions.
4 units (Faure) not given 2000-01

CHRISTIANITY

106. God and Christ: Evolution of Christian Doctrine—How the understandings of God as “Trinity” and of Jesus Christ as a divine and human being became creeds and orthodox teaching in the 4th-5th centuries. The debates over biblical interpretation, philosophy, and meanings of church rituals that led to these doctrines.
GER:3a (DR:8)
5 units, Aut (Gregg)

109. God and Gender: Christianity through the Eyes of Women—Introductory survey of contemporary feminist critiques and revisions of traditional Christian beliefs and practices. Recent contributions by womanist, Mujerista, and Asian feminists.
GER:3a,4c (DR:8†)
4 units, Spr (Pitkin)

126. Protestant Reformation—16th-century evangelical reformers (Luther, Calvin) and reform movements (Lutheran, Reformed, Anabaptist) in their medieval context.
4 units, not given 2000-01

142. Early Christianity—The Christian movement to 600 A.D., emphasizing its distinctive beliefs and practices, the importance of Christianity to changes within the late-Roman world, and emergent beliefs and practices that distinguished Christians from other groups and among themselves. Primary documents (ancient texts in translation) and surviving art and architecture show early Christianity’s modes of community organization, debates about orthodoxy and heretical teaching, and interaction with other religions. Thematic interest concerns deployment of “holy power” in people, places, rituals, objects.
4 units (Gregg) not given 2000-01

145. Protestantism: Ethics and Community—The structure and development of ethical thought in the Protestant theological tradition(s), from the Reformation to the 20th century. Readings in primary texts of representative authors: e.g., Luther, the Anabaptists, Spener, Edwards, Schleiermacher, Trelitsh, Barth, R. Niebuhr, Gustafson.
4 units (Sockness) not given 2000-01

4 units (Busto) not given 2000-01

167. Medieval and Renaissance Religious Philosophy—Survey of medieval and Renaissance philosophy, focusing on God, world, and words. A pervasive assumption about the structure of the world, that it reflected the categories of God’s mind and emerged from an act of divine speech, gave impetus to the interest in the nature of language and its relation to the world. Scripture served as one kind of divine communication to human beings, and “The Book of the World” as another. The
problem of universals, the question of how words relate to God, epistemology, theories of reference, semiotics. Readings from Augustine, Anselm, Aquinas, Scotus, and Ockham, etc. GER:3a (DR:8)
4 units, Spr (Gelber)

168. Divine Justice in Medieval Thought and Literature—Medieval ethical beliefs through legends, myths, saints’ lives, literature, and the ethical theories of medieval scholars.
4 units (Gelber) not given 2000-01

172. Sex, Body, and Gender in Medieval Religion—Anxiety about sex and the body increased markedly during the early years of Christianity, while the doctrine of the Incarnation put the human body at the center of religious concern. Ideas of virginity, chastity, aesthetic self-denial of necessities like food, sleep, and freedom from pain were central to lay and clerical piety. The religious theory and practice associated with questions about sex, body, and gender in the Middle Ages as constructed in literature, mythology, ritual, mystic, and monastic texts. GER:3a,4c (DR:8)
4 units, Win (Gelber)

173A. Religion in the Age of Reason—Western religious thought during the European Enlightenment (1650-1800). Figures and movements: the Deists, Locke, and Hume in England; the philosophes, Voltaire, and Rousseau in France; Pietism, Protestant Orthodoxy, Leibniz and Kant in Germany.
4 units (Sockness) not given 2000-01

177. Religious Existentialism—Introduction to the influence of existentialism on religious thought since Kierkegaard.
5 units, not given 2000-01

186. 20th-Century Christian Thought—Introduction to systematic theology in the 20th century through the study of the main proponents of “dialectical” or “Neo-Orthodox” theology: Karl Barth, Rudolf Bultmann, Reinhold Niebuhr, and Paul Tillich.
4 units (Sockness) not given 2000-01

JUDAISM

5 units, not given 2000-01

128. Women and Judaism—The role and image of women in classical Judaism; responses of modern Jewish women to traditional conceptions of women and femininity. Recent attempts to create a feminist Judaism.
GER:3a (DR:8)
5 units, not given 2000-01

134. The Hebrew Bible and Its Early Interpreters—The process of canonization and redaction, the question of authorship, the different genres of biblical literature, the tension between biblical law and narrative, prophetic criticism of ritual, inner-biblical (re-)interpretation. Early interpreters of biblical texts: Pseudepigrapha, Dead Sea Scrolls, Philo, Paul, Matthew, and Rabbinc Midrash.
5 units, Aut (Fonrobert)

161. Modern Jewish Thought: Political-Theological Engagements—How Jewish and non-Jewish thinkers from Spinoza to the present have situated Judaism with, in, or against modern culture and society. What is the value of modernity from a Jewish perspective rooted in ancient traditions and communities? What is the value of Judaism when judged by principles and practices such as technical progress and liberal democracy? Readings from Spinoza, Mendelssohn, Kant, Marx, Nietzsche, Ahad Ha’am, Rosenzweig, Horkheimer, Levinas, Strauss.
5 units, Spr (Kaplan)

166. Myth and Ritual in Judaism—Festivals in the Jewish tradition.
5 units, not given 2000-01

169. The Body, Sex, and Gender in Ancient Judaism—Representations of the human body, sexuality, and gender in biblical and postbiblical Judaism. Focus is on primary and secondary sources.
5 units, not given 2000-01

184. Spirit and the Law—Throughout much of post-biblical history, Torah and the commandments have been dismissed as devoid of spirit. Critics of the Law as formulated by Paul, Aquinas, Spinoza, and Kant. Jewish perspectives on the spirituality of the commandments through readings from talmudic, philosophical, kabbalistic, Hasidic, and contemporary sources. GER:3a (DR:8)
4 units, not given 2000-01

ISLAM

110. Islam in the Modern World—Critical and controversial issues in modern Islam. The beginnings of Islamic reforms in the 19th-century Middle East and the ideas of key modern thinkers. Some thematic issues such as the notion of an Islamic state, women’s liberation, and the move towards the Islamization of education.
4 units (Moosa) not given 2000-01

110A. Updating Tradition: Law and Gender in Modern Islam—Women, gender, and tradition in Islam. Theory and case studies from different Muslim communities inside the traditional Islamic world and outside it. Experiences in N. America, the Middle East, Africa, and S. Asia. Gender theory is combined with case studies and critical applications, explored through the prism of law and religion; and how it impacts on the lives of women, family, and community in the contemporary world.
GER:3a,4c (DR:8)
4 units (Moosa) not given 2000-01

112. Women and Islam: Evolving Identities in a Changing World—The prevailing essentialized views of Islam and Muslim women, the origins of these views, and their continuing impact on contemporary popular discourse. Some of the challenges currently facing Muslim women around the world. Emphasis is on women living in Muslim societies of sub-Saharan Africa, S.E. Europe, Central Asia, the Sub-Continent, and S.E. Asia. The position of women in Muslim minority communities of Western Europe, the U.S., and China. Issues: gender and nationalism; women in development; the role of education; the changing political, cultural, and religious significance of the veil; challenges faced by Muslim women refugees, and those who have survived outbreaks of mass violence.
GER:3a,4c (DR:8)
4 units, Aut (Armijo-Hussein)

120. Islam in China—Throughout the history of Islam in China, Muslim communities have faced periods of persecution and periods of religious revival. The early history of Islam in China, focusing on government policies during the Yuan (1260-1368), Ming (1368-1644), and Qing (1644-1911) dynasties; the contemporary situation of China’s different Muslim communities, the role of Muslim women, and those who have survived outbreaks of mass violence.
GER:3a,4c (DR:2 or 8)
4 units, Spr (Armijo-Hussein)

129. Muhammad and Qur’an—Muhammad as the Prophet and the Qur’an as the primary scripture of Muslims form the core of Muslim religious thought. The multiple ways in which the Islamic tradition understands the prophet and revelation from the formative period to modern times. The biography of Muhammad and themes from the Qur’an.
GER:3a (DR:8)
4 units, Win (Moosa)
THEORETICAL AND COMPARATIVE STUDIES

121. Peoples of the Book: Prophecy and Martyrdom in Judaism, Christianity, and Islam—How each of these Abrahamic traditions conceived of the prophet and the martyr, and what functions these figures play within the three religions, e.g., in their distinctive theologies and rituals. Comparative study of a select number of texts (and artistic representations). GER:3a (DR: 8)
   5 units, Win (Gregg, Moosa)

122. Wealth and Poverty in the Biblical Tradition
   4 units, not given 2000-01

143. Chicano/Latino Religious Traditions—The religious traditions that created and continue to influence the history, politics, and formation of Mexican American communities. Topics: ancient Meso-america, Mexican Catholicism, Movimiento indigenismo, Evangelicos, Latino theology, Chicana innovations. GER:3a,4b (DR:3 or 8)
   4 units, Spr (Busto)

148. Social Theory and Religion
   5 units (Eisen) not given 2000-01

149. Theories of Religion—The origin and persistence of religious behavior and belief in the modern period. Philosophical, sociological, historical, and psychological theories, “classic” and contemporary.
   5 units, not given 2000-01

155. Asian/Pacific American Religious Traditions—The role of religion in Asian American and Pacific Islander communities since the 19th century. Topics: the impact of immigration laws on religious life, WW II internment, the transformation of Asian traditions, Christian evangelicism, Asian American theology, the controversy over "American Buddhism." Prerequisite: consent of instructor.
   4 units, not given 2000-01

157. Readings in Greco-Roman Religion—Texts on Greco-Roman philosophical and religious thought, pointing towards the activities of discrete groups.
   5 units (Gregg) not given 2000-01

163. Religion and Ethnicity/Race—Religion and issues of race, class, and gender in the history and development of racially ethnic communities. Religion as promoting or resisting assimilation. Issues: revitalization, theologies of liberation, dissent, and transformation within traditions. GER:3a,4b (DR:3 or 8)
   5 units, Win (Busto)

165. Religious Ritual—Classical and contemporary theories of religious ritual, with case studies from a variety of traditions.
   5 units (Faure) not given 2000-01

179. Religion in Science Fiction and Fantasy—What religion is to us can be discerned in the ways we imagine it to be. The place of religion in the modern literary imagination, through science fiction texts and films, is assessed in conjunction with theoretical texts that define religion in the academic imagination. Students construct a fictional religion or religious situation.
   5 units (Gelber) not given 2000-01

183. The Death of God: Between Hegel and Marx—The radical transformations in Western notions of God between the death of Hegel and the birth of historical materialism, arguing that questions about theism and atheism, humanism, and history formulated in the period 1831-1846 are still pertinent today. Texts from Hegel, the Young Hegelians, Feuerbach, and Marx on issues of God, history, and the social dimensions of human nature. GER:3a (DR:8)
   4 units (Sheehan) not given 2000-01

188. Liberation Theology—GER:3a (DR:8)
   4 units, Win (Sheehan)

196T. Heidegger and Hermeneutics—(Same as Interdisciplinary Studies in Humanities 196T.)
   5 units, Aut (Sheehan)

UNDERGRADUATE DIRECTED READING

197. Senior Essay—Prerequisite: consent of instructor and of the department.
   Aut, Win, Spr (Staff)

199. Individual Work—Prerequisite: consent of instructor and of the department.
   Aut, Win, Spr (Staff)

UNDERGRADUATE SEMINARS

ASIAN RELIGIONS

206. Popular Chinese Religion—Beliefs and practices centered around life, death, and the afterlife; concepts of divinity and the structure of the popular pantheon; communication with the divine; ritual celebrations and specialists; messianic movements; popular religious arts (performative, literary, and visual).
   4 units, not given 2000-01

210. Speech and Writing in the Buddhist Traditions—Using Western “literature” on writing and morality (Derrida, Ong, Goody), examines various conceptions of speech and writing found in E. Asian religions, specifically the way writing has transformed the Chan/Zen tradition, and our interpretation of it.
   4 units (Faure) not given 2000-01

212. Chuang Tzu—Interpretive approaches to the challenges presented by the Taoist text, the Chuang Tzu (Zhuangzi). Limited enrollment.
   4 units, Win (Yearley)

213. The Taoist Canon—Survey of the history and contents of the collection of texts popularly known as the Daozang (Taoist Canon).
   4 units, Win (Boltz)

214. Taoist Rites of Exorcism—Contextual and comparative views of traditional Taoist exorcist practice, as described in anecdotal writings and prescribed in ritual formularies, emphasizing its theatrical dimensions and kinship to judicial inquiry.
   4 units, Spr (Boltz)

218. Ch'an/Zen and Local Religion—The relationships between the Ch'an/Zen tradition and Chinese or Japanese local religion, focusing on forms of symbolic mediation (ritual, meditative techniques, etc.) in both religious traditions. Prerequisite: consent of instructor.
   5 units (Faure) not given 2000-01

230A. Zen Buddhism Seminar—Selected topics in Ch'an and Zen; may be repeated for credit.
   5 units (Bielefeldt) not given 2000-01

256. Japanese Buddhism Seminar—Selected topics. May be repeated for credit.
   4 units, Aut (Faure)

257. East Asian Buddhist Texts
   4 units (Faure) not given 2000-01

   5 units, Spr (Bielefeldt)
240. Jews, Pagans, and Christians in Late Antiquity—Case studies in the dynamics of the multi-religious ancient Mediterranean, 2nd-6th centuries A.D. Themes: competing theologies, philosophies, and soteriologies; struggles over “holy places” and territorial dominance; the relation of religious and imperial ideologies; conversions as sociopolitical events.

4-5 units, Spr (Gregg)

241. Asceticism in Pagan and Christian Antiquity

4 units (Gregg) not given 2000-01

242. Wrestling with the Text: Perspectives on the Bible in the Age of Reform, 1400-1600—Significant and often conflicting developments in the interpretation and use of the Bible by Renaissance humanists, Roman Catholics, and Protestants from the late medieval period through 1570. Issues of translation, the canon, and the authority of sacred texts.

4 units, not given 2000-01

244. Religious Studies and the Humanities: Reconstructing Religion—Friedrich Schleiermacher—Idealist philosopher, Moravian pietist, religious skeptic, hospital chaplain, charter member of the Romantic movement, head preacher at Trinity Church, co-founder of the University of Berlin, translator of Plato’s works, opponent of Hegel, pioneer in hermeneutical theory, “father of modern theology.” Examination of this multifaceted 19th-century German thinker, who reconceived the meaning of religion in the West and pioneered an approach to theology attuned to the sensibilities of modern science and history.

5 units (Sockness) not given 2000-01

268. Model Selves: Francis of Assisi—The formation of the model self in myth and history in the Western tradition, emphasizing Francis of Assisi, with reference to other model selves, masculine and feminine in Eastern and Western traditions.

5 units (Gelber) not given 2000-01

271A,B. Dante and Aquinas—Focus is on the different ways Dante and Aquinas both treat human excellencies, such as love and courage; and human deformations, such as pride and anger. Students may take 271A without B.

4 units (Yearley) not given 2000-01

273. Aquinas’ Ethics—Thomas Aquinas’ general theory of human flourishing and his analysis of specific human excellences (e.g., love, courage, and magnanimity) and human deformations (e.g., vanity, pride, and envy). Limited enrollment.

5 units (Yearley) not given 2000-01

274. From Kant to Kierkegaard—The main currents of religious thought in Germany from Kant’s critical philosophy to Kierkegaard’s revolt against Hegelianism. Emphasis is on the theories of religion; the epistemological status of discourse about God; the role of history, especially, the figure of Jesus; and the problem of alienation/reconciliation in four seminal modern philosophers: Kant, Schleiermacher, Hegel, and Kierkegaard.

5 units (Sockness) not given 2000-01


5 units, not given 2000-01


5 units (Harvey) not given 2000-01

280. Schleiermacher—The “father of modern theology,” Friedrich Schleiermacher (1768-1834) has held a monumental place in the history of Western religious thought since the Enlightenment. Exploration of his controversial reconception of the theological enterprise through a study of his most significant religious writings.

4 units (Sockness) not given 2000-01

JUDAISM

226. Orthodoxy and Heresy in Classical Judaism—Rabbinic Judaism is a culture that is structured around disagreement and dispute. It is in its essence a culture of dissent. Classical Jewish texts, especially the Talmud, encourage a multiplicity of views on any given subject (legal and theological) and on issues of interpretation. The boundaries of rabbinic disagreement, the emergence of the notion of heresy and the Jewish heretic, concepts of normativity and authenticity, definitions of idolatry, the consolidation of Judaism as an ethnicity.

4 units, Aut (Fonrobert)


4 units, Spr (Gregg)

260. Contemporary Jewish Thought: Jewish Feminism and Jewish Tradition—Jewish women’s relationship to Jewish tradition, and the theology and religious practices of contemporary Jewish feminism. Topics: gender in traditional Jewish society; traditional women’s spirituality, rituals, and liturgy; gender and Jewish modernity; the feminist critique of Jewish tradition and the creation of alternative traditions; the “feminization of Judaism.”

4 units, not given 2000-01

264. Hasidism and Modernity—Hasidism, a Jewish pietist movement in late 18th-century Eastern Europe, can be viewed as a blend of the traditional and the modern. Primary sources and secondary literature show this polarity in historiographies and representations of Hasidisms, the zaddic as an alternative type of Jewish leader, the roles of textual and non-textual authority in Hasidic culture, Hasidism’s relationship to kabbalah and Sabbateanism.

4 units, not given 2000-01

282. Classics of Medieval Jewish Thought—Close study of medieval Hebrew theological writings in translation (with an optional Hebrew component), focusing on issues such as reason and revelation, prophecy, the final human end, scriptural interpretation and rabbinic exegesis, and messianism. Topic: Moses Maimonides’ Guide of the Perplexed and its medieval and modern interlocutors.

5 units, not given 2000-01

THEORETICAL AND COMPARATIVE STUDIES

208. Feminist Theology—Seminar examining contemporary feminist critiques, rejections, and revisions of traditional Western, principally Christian, beliefs and practices.

4 units, not given 2000-01

211. Theory in Practice: Religion and Economics

5 units (Faure) not given 2000-01

225. Syncretism and Revitalization Movements—Reading and re-evaluating “classic” models of religious change. Case studies in religious change under conquest, colonialism, and crisis.

4 units (Busto) not given 2000-01

247. American Religious Ethics—Is there a distinctive American approach to the relation of ethics and religion? Representative texts of American Puritans, Transcendentalists, Pragmatists, and Naturalists,
with attention to experience, conversion, moral discernment, and social responsibility.

5 units, not given 2000-01

251. Approaches to Native American Traditions—Native American traditions have been studied from a variety of disciplines and assumptions. Seminar critiques the ways scholars (Indian and non-Indian) have advanced our understanding of Native American world views.

5 units (Busto) not given 2000-01


5 units (Busto) not given 2000-01

261. Modernization/Secularization—Reexamination of these two fundamental concepts in light of recent historical, sociological, anthropological, and philosophical developments.

5 units (Eisen) not given 2000-01

270. Science and Religion—Team-taught examination of the similarities and differences between two sets of practices (scientific and religious) and the modes of knowledge associated with them. Case studies primarily from biology and Judaism. Emphasis is on genetics, the evolution of learning and communication; revelation and tradition; ritual; religious and scientific communities.

4 units, Aut (Bergman, Eisen)

272. Skepticism and Morality—Meta-ethics. What is the nature and justification of moral truth claims?

5 units, not given 2000-01

286. Character and the Good Life—Is it possible or desirable to revive classical notions of good character and the good life? Are such ideals irrelevant to modern pluralistic societies? These questions are pursued in modern works that analyze the issues and classical definitions, Western and Chinese, of human excellence. Limited enrollment.

5 units (Yearley) not given 2000-01

290. Majors Seminar—Required for Religious Studies majors and suggested for joint RSV/Philosophy majors to discuss critical issues in the study of religion, and to work on senior essays in progress. Topic for 2000-01: theories and methods in the study of religion, via classical authors, e.g., Durkheim and Weber; and contemporary readings, including scholarship by faculty members in the department. (WIM)

4 units, Spr (Schopen)

GRADUATE DIRECTED READING

299. Individual Work—Prerequisite: consent of instructor.

Aut, Win, Spr (Staff)

GRADUATE SEMINARS, RESEARCH, AND TEACHING

Topics of directed research (numbers ending in 9) vary each year according to student initiative and faculty research interests.

304A. Theories and Methods in the Study of Religion—Required of all graduate students in Religious Studies. Various approaches to the study of religion. Prerequisite: consent of instructor.

4 units, not given 2000-01

304B. Theories and Methods in the Study of Religion—Required of all graduate students in Religious Studies. Various approaches to the study of religion. Prerequisite: consent of instructor.

4 units, Aut (Yearley)

306. Early Daoist Ritual—The evolution of ritual in organized Celestial Masters Daoism between the late 2nd through 5th centuries, focusing on Tao Hongjing's work, Dengzhen yinjue. The development of Daoist ritual during the first centuries of its formation.

4 units, not given 2000-01

310. Buddhist Studies Proseminar

5 units (Bielefeldt) not given 2000-01

311A.B. Buddhist Studies Seminar

5 units, Win, Spr (Faure)

315. Ch'an Studies: Methodological Issues—The relevance of recent developments in "theory" (hermeneutics, structuralism, post-structuralism, critical theory) for the study of the Ch'an and Zen tradition. Readings from Foucault, Derrida, Ricoeur, Bourdieu, and Ch'an/Zen classics. Prerequisite: consent of instructor.

4 units (Faure) not given 2000-01

317. Zhuang Zhou as Husband: Gender-Shifting Views of Renunciation in Chinese Culture—A reflective reading of a late Ming story behind a diverse operatic legacy, which frames the Daoist figure Zhuangzi's quest as a test of his wife's fidelity.

4 units, Aut (Boltz)

319. East Asian Religions—Directed research.

(Bielefeldt, Faure, Yearley)

321. Graduate Seminar in Modern Judaism—In-depth examination of two recent developments of major importance in Jewish life and thought: spirituality and feminism. Prerequisite: consent of instructor.

4 units (Eisen) not given 2000-01


(Eisen, Gregg)

338. Mystics and Mysticism—The western Middle Ages are a laboratory for exploring accounts of mystical experience. Medieval mysticism was diverse: a neo-Platonic strand wound from Augustine and Pseudo-Dionysius to Meister Eckhart, Nicholas of Cusa, and John of the Cross. An emotive, passion-filled version found voice among the Cistercians, Francisca, and the women mystics of the period, culminating in the Carmalites Teresa of Avila, and again, John of the Cross. Initial focus is on Christian tradition: participants explore the mystical literature of other traditions (Islam, Judaism, Buddhism) in cross comparison with medieval Christian accounts.

4 units (Gerber) not given 2000-01

339. Medieval Western Religions—Directed research.

(Gerber, Yearley)

344. Religious Challenges of the Postmodern—Seminar analyzes and criticizes defining philosophical texts of the postmodern, and probes their possible consequences for religion and theology. Representative texts from Nietzsche, Heidegger, Derrida, Levinas, and Nancy.

4 units (Sheehan) not given 2000-01

345. Comparative Religious Ethics

5 units (Yearley) not given 2000-01

348. Early Christianity: Text and Art—(Same as Interdisciplinary Studies in Humanities 311.) Significant events and issues in Christianity's emergence as a religious "culture," 100-700 A.D. Each week, a text and a related piece or program of art/architecture open such topics as Christianity's appropriation of Greek and Roman models of thought, religious competitions intellectual and "muscular," and intersections and diversions of piety and politics.

3-5 units, Aut (Gregg)
350. Origins of the Mahayana—Models and theories of the origin and early history of the Mahayana in India. Critical readings of the scholarship produced over the last 100 years.
4 units, Spr (Schopen)

360. Graduate Seminar in American Religions—Readings in American religious historiography and sociology showing the shifts in scholarship and highlighting the major controversies/trends in American religion.
4 units, Win (Busto)

370. Graduate Seminar in Religious Ethics—The difference “religious” makes in religious ethics and how it affects issues of genre. A treatment of theoretical analyses with examples from the W. and E. Asia. May be repeated for credit. Prerequisite: consent of instructor.
4 units, Win (Yearley)

373. Historicism and Its Problems—The emergence, varieties, and crises of historicism as a world view and approach to the study of religion in the 19th and 20th centuries. The implications of historical reason and historical consciousness for the philosophy of religion, ethics, and Christian theology.
4 units, Aut (Sockness)

379. Religious Thought—Directed research.
(Bielefeldt, Eisen, Gelber, Yearley)

(Eisen, Faure, Yearley)

390. Teaching in Religious Studies—Required supervised internship.
4 units, Aut, Win, Spr (Staff)

391. Pedagogy—Required of Ph.D. students.
1 unit, Aut (Staff)

392. Candidacy Essay—Prerequisite: consent of graduate director.
variable units, Aut, Win, Spr (Staff)

395. Master of Arts Thesis
2-9 units (Staff)

AFFILIATED DEPARTMENT OFFERINGS
HISTORY
294/394. Law and Order in Premodern China
5 units, Spr (Neskar)

OVERSEAS STUDIES
BERLIN
126R. The German Reformation and Its Consequences, 1500-1648
4 units, Win (Pitkin, Sockness)

141R. Religion in the Age of Goethe
3 units, Win (Sockness)

KYOTO
17R. Religion and Japanese Culture
4-5 units, Spr (Ludvik)

CENTER FOR RUSSIAN AND EAST EUROPEAN STUDIES
Emeriti: Joseph N. Frank, Alex Inkeles, Jan F. Triska, Joseph Van Campen, Henry Rowen, Wayne S. Vucinich

Committee in Charge: The Steering Committee on Russian and East European Studies
Director: Nancy Kollmann (History)
Assistant Director: Mary Dakin
Academic Coordinator: Jack Kollmann

Professors: Terence L. Emmons (History, on leave Autumn), Lazar Fleishman (Slavic Languages, on leave), Gregory Freidin (Slavic Languages), David J. Holloway (History, Political Science, on leave), Nancy S. Kollmann (History), David Laitin (Political Science), Norman Naimark (History), Aron Rodrigue (History), Richard D. Schupbach (Slavic Languages), Nancy B. Tuma (Sociology), Steven J. Zipperstein (History)

Associate Professor: Monika Greenleaf (Slavic Languages)
Assistant Professors: Leah Dickerman (Art and Art History), Michael McPaul (Political Science, on leave Autumn), Gabriella Safian (Slavic Languages), Amir Weiner (History)

Courtesy Professor: Coit Blacker (Political Science)
Senior Lecturers: Rima Greenshll (Slavic Languages)
Lecturers: Alison B. Alter (Political Science), Serafima Gettys (Slavic Languages), Jack Kollmann (Russian and East European Studies)
Acting Professor: Izaly Zemtsovsky (Cultural and Social Anthropology, and Slavic Languages)
Acting Assistant Professor: Katherine Jollick (History)
Consulting Professor: Thomas W. Simons, Jr. (History)
Visiting Professors: Oksan Bulgakowa (Slavic Languages), Alan Timberlake (Slavic Languages), Viktor Zhivov (Slavic Languages)
Visiting Associate Professor: John Earle (Economics)
Affiliates: Michael Bernstein (Hoover Institution), Robert Conquest (Hoover Institution), John B. Dunlop (Hoover Institution), Joseph D. Dwyer (Hoover Institution), Gail Lapidus (CISAC), Bertrand Patenaude (Hoover Institution), Condoleeza Rice (Political Science), Geoffrey Rothwell (Economics), Karen Rondesvedt (Stanford Libraries)

The Center for Russian and East European Studies (CREES) coordinates the University’s teaching, research, and extracurricular activities related to the area of the former Soviet Union and Eastern Europe, and administers two interdisciplinary academic programs: an undergraduate minor and an A.M. graduate degree program. For further information, contact the Center for Russian and East European Studies, Building 40, Main Quad, Stanford University, Stanford, CA 94305-2006; telephone (650) 723-3562. Information on center programs and activities is also available on the Web at http://www.stanford.edu/dept/CREES/.

The A.M. program, which may be taken either separately or coterminal with an A.B. degree program, is an intensive one-year course of study for students with a strong language and area studies background. It is directed by the CREES Steering Committee composed of faculty members affiliated with the center. The interdisciplinary A.M. program typically serves three types of students:
1. Those who intend to apply to a Ph.D. program involving Russian and East European studies and who need to enhance their academic skills and credentials.
2. Those who intend to pursue advanced degrees and/or careers in such fields as business, education, government, journalism, law, and who wish to establish a corollary competence in Russian and East European studies.
3. Those who are as yet undecided on a career but who wish to continue an interest in Russian and East European studies.

Each A.M. candidate works with the CREES Academic Coordinator who advises on a program of course work, monitors the student’s progress toward completing the degree, and assists the student in planning for postgraduate employment or further education. In addition, each A.M. candidate is assigned to a CREES-affiliated faculty member for academic and career counseling.
UNDERGRADUATE PROGRAMS

MINORS
The minor in Russian and East European Studies (REES) is an interdisciplinary area studies program that allows the participating student significant opportunity to select REES courses in various departments according to his or her interests.

REQUIREMENTS

1. Two core courses: one on Russia/Soviet Union, one on Eastern Europe, to be selected by the student from an annual list of qualifying courses issued by CREES.
2. At least four additional REES courses, totaling at least 20 units.
3. The student’s courses, core and additional, must be distributed among at least three departments. In addition to REES courses in the departments of History, Political Science, and Slavic Languages and Literatures, REES courses in Cultural and Social Anthropology, Economics, Sociology, and so on, when offered, may qualify. The CREES academic coordinator determines which courses qualify for the minor.
4. A “capstone” experience in REES, including, but not limited to, one of the following:
   a) A departmental seminar course for advanced undergraduates
   b) Directed reading and research with a Stanford faculty member or a CREES-approved resident or visiting scholar
   c) Participation in the Stanford Moscow Overseas Studies program

Foreign Language—The REES minor has no language requirement, but the participating student is strongly encouraged to attain working competence in Russian or another relevant language. Courses at the third-year level or above in Russian or another language of the former Soviet Union or Eastern Europe (excluding German) count towards the REES minor, up to a maximum of 3 units per academic quarter, 9 units total.

Additional Information—The total number of courses applied to the REES minor must be at least six, but the minor should total no more than 36 units. Courses counting towards the REES minor may not be counted towards the student’s major. Courses taken at Stanford overseas campuses (particularly the Moscow campus) may count towards the REES minor with prior approval; at least three courses for the minor must be taken in residence at Stanford.

Approval of CREES Academic Coordinator—Students interested in pursuing the REES minor should consult the CREES Academic Coordinator, and then complete the Minor Declaration Form. Students declaring the REES minor must do so no later than five quarters prior to their intended quarter of degree conferral. Approval of minor declarations and certification of requirements are made by the Academic Coordinator. Students pursuing the REES minor work with the CREES Academic Coordinator, who is responsible for determining that requirements for the minor are satisfied. Questions about which courses count towards the minor, which courses taken overseas count towards the minor, what project counts as a “capstone” experience, and so on, are also handled by the Academic Coordinator.

COTERMINAL A.B./A.M.
To qualify for a coterminal A.M. degree in Russian and East European Studies, a student must, besides completing University requirements for the A.B. degree:

1. Submit a coterminal application for admission to the program no earlier than the beginning of the eighth quarter, and no later than the end of the eleventh quarter of undergraduate study. Students with advanced placement and transfer credit must apply at least four quarters before the expected master’s degree conferral date. Applications may be obtained from Degree Progress, the Registrar’s Office. The deadline for all applications to the A.M. program in Russian and East European Studies is January 1, 2001. The Admissions Committee considers coterminal applications at the same time that it reviews applications from outside Stanford and from other graduate degree programs within the University.

2. Include in the application a program which outlines, by quarter, the schedule of courses the student plans to complete toward the A.M. degree. The student should seek the advice of the CREES Academic Coordinator in drafting this schedule. The application also should include: (a) a current Stanford transcript, (b) a one-page statement of purpose, and (c) two letters of recommendation from Stanford professors. Applicants must have a grade point average (GPA) of at least ‘B’ (3.0). Coterminal applicants must take the General Test of the Graduate Record Examination and have the results sent to Graduate Admissions, the Registrar’s Office.

3. Complete 15 full-time quarters or the equivalent, or three quarters in full-time residence after completing 180 units; and complete, in addition, to the 180 units required for the bachelor’s degree, a minimum of 40 units for the master’s degree. The same courses may not be counted to meet both undergraduate and graduate requirements, and no courses taken before the junior year may be used to meet the course requirements for the master’s degree. Requirements for completion of the A.M. degree are summarized below; a more detailed description of the program and requirements is available from the center.

SLAVIC THEME HOUSE
Slavianskii Dom, at 650 Mayfield Avenue, is an undergraduate residence which houses 50 students and offers them a wide variety of opportunities to expand their knowledge, understanding, and appreciation of Russia and Eastern Europe.

OVERSEAS STUDIES PROGRAMS
Undergraduate students interested in the study of the languages, history, culture, and social organization of Russia and Eastern Europe can apply to study at Stanford centers in Berlin and Moscow. Graduate coursework can also be arranged for CREES A.M. students. For information about these programs, contact the Overseas Studies office in Sweet Hall.

GRADUATE PROGRAMS

MASTER OF ARTS
CREES offers a one-year intensive interdisciplinary master’s degree program in Russian and East European Studies for students with strong prior language and area studies background. Students have flexibility to pursue their particular interests, while also taking a required core curriculum that addresses 20th-century and contemporary processes of change in the former Soviet Union and Eastern Europe.

ADMISSION
Applicants may apply electronically at http://www.applyweb.com/apply/Stanford/. A printed application may be requested on the Registrar’s Office website at http://www.stanford.edu/dept/registrar/admissions/form.ffe. In addition, prospective applicants are strongly encouraged to consult with the Academic Coordinator at CREES regarding the application process. The materials in the application packet provide detailed instructions for applying. To qualify for admission to the program, the following apply:

1. Applicants must have earned an A.B. or B.S. degree, or the equivalent.
2. Applicants must have completed at least three years of college-level Russian language study or the equivalent prior to beginning the program. Other languages of Eastern Europe or the former Soviet Union may be accepted on a case-by-case basis.
3. Applicants whose native language is not English are ordinarily expected to take the Test of English as a Foreign Language (TOEFL) and have the results sent to Graduate Admissions, the Registrar’s Office.
4. All applicants must take the general test of the Graduate Record Examination and have the results sent to Graduate Admissions, the Registrar’s Office.
The deadline for submission of applications for admission and for financial aid is January 1, 2001. Admission is normally granted for Autumn Quarter, but requests for exceptions are considered.

The successful applicant generally demonstrates the following strengths: requisite foreign language study, significant course work in Russian and East European studies in multiple disciplines, outstanding grades in previous academic work, high GRE scores (particularly verbal and analytical), study or work experience in the region, strong letters of recommendation, and a persuasive statement of purpose explaining why and how the program fits the applicant's academic and career goals.

DEGREE REQUIREMENTS

Candidates for the A.M. degree must meet University requirements for an A.M. degree as described in the "Graduate Degrees" section of this bulletin.

The A.M. program in REES can ordinarily be completed in one academic year by a well-prepared student; longer periods of study are permitted.

Requirements to complete the interdisciplinary A.M. degree are principally ones of distribution, with the exception of three required core courses, as described below. Each student, with the advice of the CRees Academic Coordinator, selects courses according to the student's interests, needs, and goals. All students in the A.M. REES program must complete a minimum of 40 academic credit units within the following guidelines.

1. **Language Study:** students in the program must study Russian or another language of the former Soviet Union or Eastern Europe. Credit towards the 40-unit minimum (maximum 3 units per quarter, 9 units total) is allowed for advanced language work; in the case of Russian, "advanced" is defined as third-year Russian language instruction and above. Similar standards apply for other languages.

2. **Interdisciplinary Course Work:** a minimum of five graduate courses in Russian and East European studies must be completed and distributed among at least three departments. All course work applied to the 40-unit minimum must be approved by the CREES Academic Coordinator, who ensures that planned course work satisfies requirements towards the degree. The CREES Director and Steering Committee determine the specific requirements.

A description of the A.M. program is also available on the Web at http://www.stanford.edu/dept/CREES/grad.html and by request from the Center for Russian and East European Studies.

**CONCURRENT DEGREE PROGRAMS**

The Center for Russian and East European Studies collaborates with the schools of Business and Law to allow students simultaneously to pursue concurrent degrees in Russian and East European Studies (A.M.) and the respective professional field (J.D., M.B.A.). Students must apply to and be independently admitted to each degree program. For additional information about specific plans of study and degree requirements, contact the Center for Russian and East European Studies.

**DOCTORAL PROGRAMS**

Since the University does not offer a Ph.D. in Russian and East European Studies, students wishing to pursue a REES-related doctoral program must apply to one of the departments offering a Ph.D. with an emphasis on Russia, the former Soviet Union, or Eastern Europe, such as the departments of History, Political Science, or Slavic Languages and Literatures.

**COURSES**

200. Directed Individual Study—For students engaged in special interdisciplinary work that cannot be arranged by a department.
1-5 units, Aut, Win, Spr (Staff)

**AFFILIATED DEPARTMENT OFFERINGS**

The courses listed below by department deal at least in part with Russian, the Soviet Union, or Eastern Europe. See the respective department listings for course descriptions. Additional relevant courses by resident or visiting faculty may be offered; for updated information, consult the quarterly Time Schedule or contact the Center for Russian and East European Studies. Students in the area studies A.M. program must have their course list approved by the Academic Coordinator prior to enrollment.

**ART HISTORY**

107A/307A. Early Russian Art and Architecture, 1050-1725
4 units, Spr (J. Kollmann)

**CULTURAL AND SOCIAL ANTHROPOLOGY**

155B. Shaman and Shamanism in Central Asia, Siberia and the Russian Far East
5 units, Win (Zemtsovsky)

**ECONOMICS**

120. Socialist Economies in Transition
5 units, Aut (Earle)

217. Money and Finance in Economic Development
5 units, Aut (McKinnon)

**HISTORY**

19N. Stanford Introductory Seminar: Peter the Great—The Individual Shaping History, History Shaping the Individual
4 units, Win (N. Kollmann)

24N. Stanford Introductory Seminar: World War II
5 units, Spr (Weiner)

28S. Sources and Methods Seminar: Mapping Central Europe—Regional Identities in the 19th and 20th Centuries
5 units, Spr (Murdock)

**FINANCIAL AID**

Subject to funding, CREES may have a limited number of Foreign Language and Area Studies (FLAS) fellowships for U.S. citizens or permanent residents. Additional financial aid may also be available from CREES. Applicants in the A.M. program have priority in the annual FLAS competition; in recent years CREES has also awarded FLAS fellowships in the Graduate School of Business and the School of Law. Consult the CREES Academic Coordinator for further information about the application and award process. Applications for FLAS fellowships can be downloaded at http://www.stanford.edu/dept/CREES/grants.html.
102A. The International System
5 units, Win (Naimark, Simons)

119. Aristocracies and Absolutism: Early Modern Eastern Europe, 1400-1800
5 units, Aut (N. Kollmann)

120C. 20th-Century Russian and Soviet History
5 units, Aut (Weiner)

120D. Russian Intellectual and Cultural History to 1917
5 units, Win (Emmons)

125. 20th-Century Eastern Europe
5 units, Spr (Jolluck)

206B/306B. Design and Methodology for International Field Research
1 unit, Win (N. Kollmann, R. Roberts)

217/317. Undergraduate/Graduate Colloquium: Men, Women, and Power in Early Modern Russia, 1500-1800
4-5 units, Spr (N. Kollmann)

221C/321C. Undergraduate/Graduate Colloquium: Historiography of the Soviet Union
4-5 units, Win (Weiner)

224/324. Undergraduate/Graduate Colloquium: Stalinism in Eastern Europe
4-5 units, Spr (Naimark)

225D. Undergraduate Colloquium: East European Women and War in the 20th Century
5 units, Win (Jolluck)

226/326. Undergraduate/Graduate Colloquium: Modernity, Revolution, and Totalitarianism
4-5 units, Win (Weiner)

287/387. Undergraduate/Graduate Colloquium: The Jews of Russia
4-5 units, Spr (Zipperstein)

300W. Graduate Directed Reading
units by arrangement (Staff)

321A. Graduate Colloquium: Topics in Early Modern Russian Historiography
4-5 units, Aut (N. Kollmann)

420. Graduate Graduate Research Seminar: Russian Historiography
5 units, Win, Spr (Staff)

LANGUAGE CENTER

126A,B,C. Beginning Turkish
3 units, Aut, Win, Spr (Ayanoglu)

164A,B,C. Beginning Czech
3 units, Aut, Win, Spr (Staff)

165A,B,C. Intermediate Czech
3 units, Aut, Win, Spr (Staff)

167A,B,C. Beginning Polish
3 units, Aut, Win, Spr (Staff)

168A,B,C. Intermediate Polish
3 units, Aut, Win, Spr (Staff)

173A,B,C. Beginning Hungarian
3 units, Aut, Win, Spr (Szabo)

186A,B,C. Beginning Croatian
3 units, Aut, Win, Spr (Staff)

OVERSEAS STUDIES PROGRAM
MOSCOW

15. Academic Internship
4-5 units, Aut, Win (Bratersky)

16. Tutorial
3-5 units, Aut, Win (Bratersky)

21. Ethnic Moscow
3 units, Aut (Abashkin)

28. Music Internship with Moscow Chamber Orchestra
5 units, Aut (Orbelian)

32. Russian Classical Music
3-4 units, Aut (Orbelian)

119X. Russian Politics
5 units, Aut (Bratersky)

120X. Economic Reform and Economic Policy in Modern Russia
5 units, Aut (Mau)

121V. Russia in the Age of Nobility 1700-1840: State, Society, and Culture
5 units, Aut (Zorin)

146X. Contemporary Issues of Russian Society
4 units, Win (Bratersky)

178/278. Individual Vocal and Instrumental Instruction
3 units, Aut (Orbelian)

218V. War and Women in Russia in the 20th Century
4 units, Aut (Jolluck)

220V. Moscow Project: History and Memory of the Cold War
1-3 units, Aut (Naimark)

224V. Stalinism, High Stalinism, and the Cold War in Moscow
5 units, Aut (Naimark)

RUSSIAN LANGUAGE PROGRAM

10M. Intensive First-Year Russian
10 units, Aut (Staff)

51M. Second-Year Russian I
6 units, Aut (Kuznetsova)

52M. Second-Year Russian II
6 units, Win (Kuznetsova)

111M. Third-Year Russian I
6 units, Aut (Boldyreva)

112M. Third-Year Russian II
6 units, Win (Boldyreva)

118A/218A. Self-Paced Russian for Professionals
units to be announced, Win (Staff)

177M. Fourth-Year Russian I
6 units, Aut (Shimanskaya)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Quarter(s)</th>
<th>Instructor(s)</th>
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</thead>
<tbody>
<tr>
<td>178M</td>
<td>Fourth-Year Russian II</td>
<td>6</td>
<td>Win</td>
<td>Shimanskaya</td>
</tr>
<tr>
<td>119M</td>
<td>Seminar: Revolutions</td>
<td>5</td>
<td>Win</td>
<td>McFaul</td>
</tr>
<tr>
<td>121A</td>
<td>Seminar: Comparative Political Economy of Post-Socialist Transitions</td>
<td>5</td>
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<tr>
<td>121M</td>
<td>Russian Politics</td>
<td>5</td>
<td>Spr</td>
<td>McFaul</td>
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<tr>
<td>217</td>
<td>Seminar: Russia in Transition</td>
<td>5</td>
<td>Win</td>
<td>McFaul</td>
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<tr>
<td>223M</td>
<td>Seminar: Political Economy of Post-Communism</td>
<td>5</td>
<td>Spr</td>
<td>McFaul</td>
</tr>
<tr>
<td>245R</td>
<td>Seminar: The Transformation of Europe</td>
<td>5</td>
<td>Spr</td>
<td>Rice</td>
</tr>
<tr>
<td>13N</td>
<td>Stanford Introductory Seminar: Russia, Russian, Russians</td>
<td>3-4</td>
<td>Spr</td>
<td>Schupbach</td>
</tr>
<tr>
<td>60A</td>
<td>Introduction to Russian Culture</td>
<td>1</td>
<td>Aut, Win</td>
<td>Staff</td>
</tr>
<tr>
<td>105A/205A</td>
<td>Russian Jewish Music</td>
<td>5</td>
<td>Spr</td>
<td>Zemtsovsky</td>
</tr>
<tr>
<td>110</td>
<td>Russian “Crash” Course for Departing Students</td>
<td>1</td>
<td>Spr</td>
<td>Schupbach</td>
</tr>
<tr>
<td>133A/233A</td>
<td>Deviating from Dogma: Film in East Europe from 1956 to 1968</td>
<td>4</td>
<td>Spr</td>
<td>Bulgakowa</td>
</tr>
<tr>
<td>145/245</td>
<td>The Age of Experiment (1820-1850)</td>
<td>3-4</td>
<td>Aut</td>
<td>Greenleaf</td>
</tr>
<tr>
<td>146/246</td>
<td>The Age of Transgression: Russian Literature from Turgenev through Tolstoy</td>
<td>4</td>
<td>Win</td>
<td>Safran</td>
</tr>
<tr>
<td>147/247</td>
<td>The Age of Revolution: Russian Literature and Culture since 1917</td>
<td>3-4</td>
<td>Spr</td>
<td>Freidin</td>
</tr>
<tr>
<td>149/249</td>
<td>Technoscience and Russian Culture</td>
<td>4</td>
<td>Aut</td>
<td>Banerjee</td>
</tr>
<tr>
<td>151</td>
<td>Dostoevsky and His Times</td>
<td>4</td>
<td>Win</td>
<td>Frank</td>
</tr>
<tr>
<td>152/252</td>
<td>Russian Modernist Theater: Naturalism, Expressionism, Symbolism, and Futurism</td>
<td>4</td>
<td>Win</td>
<td>Bulgakowa</td>
</tr>
<tr>
<td>154/254</td>
<td>History of Russian Theater</td>
<td>4</td>
<td>Aut</td>
<td>Bulgakowa</td>
</tr>
<tr>
<td>156/256</td>
<td>Nabokov and Modernism</td>
<td>3-4</td>
<td>Spr</td>
<td>Greenleaf</td>
</tr>
<tr>
<td>161/261</td>
<td>Poetics: The Grammar of the Self when the Poet is a Woman</td>
<td>4</td>
<td>Win</td>
<td>Greenleaf</td>
</tr>
<tr>
<td>163</td>
<td>Beyond Fiddler on the Roof: The Jewish Experience in Eastern Europe through Literature and Film</td>
<td>4</td>
<td>Aut</td>
<td>Safran</td>
</tr>
<tr>
<td>1A,2B,3C</td>
<td>First-Year Russian</td>
<td>3-5</td>
<td>Aut, Win</td>
<td>Geitlys, Staff</td>
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<td></td>
<td></td>
<td>Spr</td>
<td>Staff</td>
</tr>
<tr>
<td>50</td>
<td>Review of Russian Grammar: Repair Russian</td>
<td>3-5</td>
<td>Aut</td>
<td>Staff</td>
</tr>
<tr>
<td>51,52,53</td>
<td>Second-Year Russian</td>
<td>5</td>
<td>Aut, Win</td>
<td>Spr</td>
</tr>
<tr>
<td>52B</td>
<td>Second-Year Russian</td>
<td>5</td>
<td>Win</td>
<td>Schupbach</td>
</tr>
<tr>
<td>111,112,113</td>
<td>Third-Year Russian</td>
<td>4</td>
<td>Aut, Win</td>
<td>Schupbach, Staff</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Spr</td>
<td>Gettys, Staff</td>
</tr>
<tr>
<td>177,178,179</td>
<td>Fourth-Year Russian</td>
<td>3</td>
<td>Aut, Win</td>
<td>Spr</td>
</tr>
<tr>
<td>181,182,183</td>
<td>Fifth-Year Russian</td>
<td>3</td>
<td>Aut, Win</td>
<td>Spr</td>
</tr>
<tr>
<td>199</td>
<td>Individual Work</td>
<td>1-5</td>
<td>any quarter</td>
<td>Staff</td>
</tr>
<tr>
<td>299</td>
<td>Individual Work</td>
<td>1-12</td>
<td>any quarter</td>
<td>Staff</td>
</tr>
<tr>
<td>187</td>
<td>Russian Poetry of the 18th and 19th Centuries</td>
<td>3</td>
<td>Spr</td>
<td>Greenleaf</td>
</tr>
<tr>
<td>189/289</td>
<td>Literature of Old Rus' and Medieval Russia</td>
<td>4</td>
<td>Spr</td>
<td>Zhitov</td>
</tr>
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<td>195/295</td>
<td>The History and Structure of Modern Russian</td>
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<td>Aut</td>
<td>Schupbach</td>
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<tr>
<td>211</td>
<td>Introduction to Old Church Slavic</td>
<td>3</td>
<td>Win</td>
<td>Timberlake</td>
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<td>212</td>
<td>Old Russian and Old Church Slavic</td>
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<td>Spr</td>
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<td>225</td>
<td>Readings in Russian Realism</td>
<td>4</td>
<td>Aut</td>
<td>Safran</td>
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<td>272</td>
<td>Osip Mandelstam and the Modernist Paradigm</td>
<td>4</td>
<td>Win</td>
<td>Freidin</td>
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<td>272B</td>
<td>Osip Mandelstam and the Modernist Paradigm</td>
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<td>Spr</td>
<td>Freidin</td>
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SCIENCE, MATHEMATICS, AND ENGINEERING CORE

Program Director: Brad Osgood

Core Faculty: Kevin Arrigo (Geophysics), Patricia Burchat (Physics), Paul Ehrlich (Biological Sciences), Martin Fejer, (Applied Physics), Russell Fernald (Psychology, Human Biology), James Ferrell (Molecular Pharmacology), Rosemary Knight (Geophysics), Brad Osgood (Electrical Engineering), Mark Zoback (Geophysics)

Research Scientists: Gretchen Daily (Biological Sciences)

Stanford’s SME Core is a program in science, mathematics, and engineering for students whose primary interests are in the humanities or social sciences. SME Core courses offer an active encounter with the essential ideas of science, mathematics, and engineering, with an emphasis on the process of science. Whether or not one enters a scientific or technical career, one’s life is increasingly affected by developments in science and its applications. SME courses equip undergraduates to better understand these aspects of the modern world.

The courses are team-taught by faculty from across the university, each bringing expertise and insights from his or her own field. Laboratory sessions are provided in the program’s own dedicated lab space in which students conduct experiments, develop projects, and explore the concepts covered in the lectures. The courses make significant use of computers and related technologies.

One two-quarter track (winter, spring) and three one-quarter courses are offered in the SME Core for 2000-01. Students enrolling in the two-quarter “Information” track (SME 8A, B) must start in the Winter Quarter. The three one-quarter courses (SME 4, 5, 6) may be taken separately for GER credit; completion of all three fulfills all of GER Area 2.

COURSES

4A,B,C. Light in the Physical and Biological Worlds—Light is the most familiar physical phenomenon, but its true nature is elusive and its study has had a profound effect on the development of science and technology. The fundamental nature of light and how it interacts with organic and inorganic matter. GER:2 (if entire sequence is completed)
not given 2000-01

4. Oceans and Atmospheres—What are the fundamental problems of earth resources, natural hazards, and climate change? Understanding the Earth’s major geosystems: plate tectonics, major ocean currents, and atmospheric circulation. (Completion of 4, 5, 6 fulfills GER:2; may be taken separately for Area 2 subarea)

4 units, Aut (Arrigo, Zoback)

5. Food and Water for a Changing Earth—The issues of food and water are among the most critical we face. What are the challenges in feeding the world’s growing population and providing adequate water supplies for consumption and irrigation? How can we analyze the present situation, make projections, and affect what is to come? (Completion of 4, 5, 6 fulfills GER:2; may be taken separately for Area 2 subarea)

4 units, Win (Knight, Staff)

6. Evolution, Ecology, and the Human Condition—What are the evolutionary origins of modern-day human beings and society? How do we interact with the natural environment, and what are possible trajectories for the future? What exactly is our impact on Earth’s life support systems and how might these impacts be brought into balance with what the biosphere can sustain GER:2 (Completion of 4, 5, 6 fulfills GER:2; may be taken separately for Area 2 subarea)

4 units, Spr (Daily, Ehrlich)

8A,B. Information: Bits to Chips, Genes to Organisms—From computers and the Internet to cell signaling and genetics, great progress in modern technology and science has come from understanding how information is exchanged, processed, and perceived. Why has the world gone digital? How do cells know when to divide, and when to stop? How do our senses work and how can they be modeled and extended? Winter Quarter explores the nature of information in its physical, mathematical, and biological forms. Spring Quarter studies how physical and biological devices and sensors manage information. Topics: coding, compression and error correction, randomness, the human genome, cell development, vision and hearing, imaging and computer graphics, semiconductors and lasers. GER:2a, 2b (DR:5,6) (if both quarters are completed)
4 units, Win, Spr (Burchat, Fernald, Ferrell, Osgood)

SCIENCE, TECHNOLOGY, AND SOCIETY

Emeriti: James Adams (Management Science and Engineering, Mechanical Engineering), Alex Inkeles (Sociology), Walter Vincenti (Aeronautics and Astronautics)

Co-Directors: Paula Findlen (History), Robert McGinn (Management Science and Engineering, Science, Technology, and Society; and, by courtesy, Civil and Environmental Engineering)

Program Committee: Stephen Barney (Management Science and Engineering), Barton Bernstein (History), Joseph Corn (History), Sarah Jain (Cultural and Social Anthropology, Science, Technology, and Society), Reviel Netz (Classics), Eric Roberts (Computer Science, Scott Sagan (Political Science)

Affiliated Faculty and Staff: Francois Bar (Communication), Stephen Barney (Management Science and Engineering), Scott Bukatman, (Art and Art History), Joseph Corn (History), David Freyberg (Civil and Environmental Engineering), Sarah Jain (Cultural and Social Anthropology), Gilbert Masters (Civil and Environmental Engineering), Reviel Netz (Classics), Eric Roberts (Computer Science), Nathan Rosenberg (Economics), Scott Sagan (Political Science), Paul Turner (Art and Art History), Gavin Wright (Economics)

Consulting Professors: Naushad Forbes (Science, Technology, and Society), Richard Meehan (Civil and Environmental Engineering)

Lecturers: Michael J. Gorman, Margo Horn, Henry Lowood, Alex Pang, Nicholas J. Wilding

Technology and science are activities of central importance in modern life, intimately bound up with industrial society’s evolving character, problems, and potentials. If scientific and technological pursuits are to further enhance human well-being, they and their effects on society and the individual must be better understood by nontechnical professionals as well as by engineers and scientists. Issues of professional ethics and social responsibility confront technical practitioners. At the same time, lawyers, public officials, civil servants, and business people are increasingly called upon to make decisions requiring a basic understanding of science and technology and their ethical, social, and environmental consequences. Ordinary citizens, moreover, are being asked with increasing frequency to pass judgment on controversial matters of public policy related to science and technology. These circumstances require education befitting the complex sociotechnical character of the contemporary era.

Science, Technology, and Society (STS) is an interdisciplinary program devoted to understanding the nature, consequences, and shaping of technological and scientific activities in modern industrial society. Achieving this understanding requires critical analysis of the interplay of science and technology with human values and world views, political and economic forces, and cultural and environmental factors. Hence, students in STS courses study science and technology in society from a variety of perspectives in the humanities and social sciences. To provide a basic understanding of technology and science, STS majors are also required to achieve either literacy (A.B.) or a solid grasp of fundamentals (B.S.) in some area of engineering or science.
SELECTED STS COURSES MAY BE USED, INDIVIDUALLY OR IN GROUPS, FOR VARIOUS PURPOSES:
1. TO SATISFY UNIVERSITY GENERAL EDUCATION REQUIREMENTS
2. TO SATISFY THE TECHNOLOGY IN SOCIETY REQUIREMENT OF THE SCHOOL OF ENGINEERING
3. TO COMPRISE PARTS OF STUDENT-DESIGNED CONCENTRATIONS REQUIRED FOR MAJORS IN FIELDS SUCH AS HUMAN BIOLOGY AND PUBLIC POLICY
4. TO SATISFY THE REQUIREMENTS OF THE STS HONORS PROGRAM COMPLEMENTING ANY MAJOR (SEE BELOW)
5. TO SATISFY REQUIREMENTS FOR MAJORS IN STS (SEE BELOW)
6. TO SATISFY REQUIREMENTS FOR A MINOR IN STS (SEE BELOW)

STS COURSES ARE PARTICULARLY VALUABLE FOR UNDERGRADUATES PLANNING FURTHER STUDY IN GRADUATE PROFESSIONAL SCHOOLS (FOR EXAMPLE, IN BUSINESS, EDUCATION, ENGINEERING, LAW, JOURNALISM, OR MEDICINE) AND FOR STUDENTS WISHING TO RELATE THE SPECIALIZED KNOWLEDGE OF THEIR MAJOR FIELDS TO BROAD TECHNOLOGY- AND SCIENCE-RELATED ASPECTS OF MODERN SOCIETY AND CULTURE.

UNDERGRADUATE PROGRAMS

Degree programs in STS are interdisciplinary curricula devoted to understanding the nature and significance of technology and science in modern society. Majors analyze phenomena of science and technology in society from ethical, aesthetic, historical, economic, and sociological perspectives. In addition, students pursuing the A.B. degree study a technical field in sufficient depth to obtain a grasp of basic concepts and methods, and complete a structured concentration on a theme, subarea, or problem related to science and technology in society. Those seeking the B.S. degree complete at least 50 units in technology, science, and mathematics. The particular technical courses chosen reflect the student’s special interest in science and technology in society. Specific requirements for the bachelor’s degree in STS are as follows:

BACHELOR OF ARTS
1. STS Core (eight courses):
   a) Interdisciplinary Foundational course (STS 101 or 101Q)
   b) Disciplinary Analyses (five courses with no more than two courses in each category):  
      1) Philosophical perspectives (STS 110, 113, 117, 118, 119, 133)
      2) Historical perspectives (STS 102, available as core course 2001-02; 121; 123, available as core course 2001-02; 124; 125)
      3) Social Science perspectives (STS 107, 137, 138, 149, 155, 162)
   c) Advanced courses (one course in each category):
      1) Disciplinary analysis (STS 207, 215, 219, 229, 231, 255 or 266)
      2) Senior Colloquium (STS 200)
2. Technical Literacy (five courses):
   a) Computer literacy, normally demonstrated by successfully completing Computer Science 105 or its equivalent.
   b) Science or engineering literacy demonstrated by one of the following:
      1) Completing a four-course sequence (minimum of 12 units) in one field of engineering or science (sample sequences available in the STS office).
      2) Completing four of the following “Engineering Fundamentals” courses: Engineering 14, 15, 20, 30, 40, 50, 60, 70 (see the descriptions in the “School of Engineering” section of this bulletin).
3. Thematic Concentration (minimum of 20 units, at least five courses, one each from among those designated on the appropriate concentration course list as “foundational” and “advanced”). Thematic Concentrations are organized around an STS-related problem or area. The following Thematic Concentration topics have been preapproved:
   a) Advanced courses (one course in each category):
      1) Philosophical concepts (STS 110, 113, 117, 118, 119)
      2) Historical perspectives (STS 102, available as core course 2001-02; 121; 123, available as core course 2001-02; 124; 125)
      3) Social Science perspectives (STS 107, 137, 138, 149, 155, 162)
   c) Advanced courses (one course in each category):
      1) Disciplinary analysis (STS 207, 215, 219, 229, 231, 255 or 266)
      2) Senior Colloquium (STS 200)
3. Thematic Concentration (minimum of 20 units, at least five courses, one each from among those designated on the appropriate concentration course list as “foundational” and “advanced”). Thematic Concentrations are organized around an STS-related problem or area. The following Thematic Concentration topics have been preapproved:
   a) Advanced courses (one course in each category):
      1) Philosophical concepts (STS 110, 113, 117, 118, 119)
      2) Historical perspectives (STS 102, available as core course 2001-02; 121; 123, available as core course 2001-02; 124; 125 or 132)
      3) Social Science perspectives (STS 107, 137, 138, 149, 155, 162, 170, 171 or 183)
3. Two advanced courses, from one or two of the following categories, building on courses taken under requirements 1 and 2:
   a) Historical Perspectives (STS 102, available as core course 2001-02; 121; 123, available as core course 2001-02; 124; 125 or 132)
   c) Social Scientific/Policy Perspectives (STS 207, 219, 231, 233, 255, 266, 279, 280)
   d) Historical Perspectives (STS 102, available as core course 2001-02; 121; 123, available as core course 2001-02; 124; 125 or 132)
   e) Social Scientific/Policy Perspectives (STS 207, 219, 231, 233, 255, 266, 279, 280)
4. At least one of the courses taken under requirements 1 to 3 must incorporate a weekly small group discussion.

Note—Students wishing to use a course not listed above to satisfy one of the requirements for a minor in STS may petition to do so. For details, inquire at the STS office (Bldg. 370, room 109).

HONORS PROGRAM

STS offers a limited number of students an opportunity to achieve honors through in-depth study of the interaction of science and technology with society. The honors program is open to students majoring in any field (including STS). Students accepted for this program carry out an
honors project, the work for which normally begins in Spring Quarter of
the junior year and is completed by mid-May of the senior year. Usually,
this project entails writing an honors essay, although occasionally stu-
dents have chosen to produce a technical artifact or carry out some other
work that itself represents original thinking. When a project results in
a work other than an essay, students must also submit an accompanying
scholarly exegesis of the work.

ADMISSION

Application for admission to the STS honors program is typically
made during the last quarter of the student’s junior year. By the eighth
week of that quarter, interested students must have completed, or be
completing that quarter, at least two of the four courses required to sat-
ify honors requirements 1 to 4 listed below. Each applicant must also
have submitted a formal proposal for her or his project to the STS Hon-
ors Committee. For proposal parameters, see the brochure Honors Pro-
gram Requirements, available in the STS office. Students whose propos-
als are approved are encouraged to apply to attend Honors College in early
September to get a running start on their theses. STS honors students are
also encouraged to sign up for 3-5 units of credit per quarter in STS
190A,B,C for work on the honors project. While not required, doing so
will leave the student sufficient time to finish the thesis in three quarters.
Writing a senior honors thesis while simultaneously carrying a full aca-
demic load each quarter is a very difficult task to complete with distinc-
tion. STS majors pursuing honors in STS or another honors program take
STS 200 for 2 units instead of 4 and do not write a research paper for this
required course. However, failure to complete the thesis requires addi-
tional research work in STS 200. (Note: under exceptional circumstanc-
es, a student may be admitted to the STS honors program early in the first
quarter of his or her senior year.)

REQUIREMENTS

1. Foundational Course: STS 101 or 101Q.

2. One Philosophical and Ethical Perspectives Course: STS 110, 113 or
   118.

3. One Historical Perspectives Course: STS 102 (available as core course
   2001-02), 107, 121, 123 (available as core course 2001-02), 124 or
   125.

4. One Social Science Perspectives Course: STS 107, 137, 138, 149, 155,
   162, 170, 171 or 183.

5. Honors Project: an original critical essay (or investigative project with
   accompanying explanatory essay) on an STS topic of general impor-
tance (12 to 15 units). Past honors projects are on file in the STS li-
brary.

   To earn honors, the project must receive a grade of at least ‘B.’ The
   student not majoring in STS must also achieve a grade point average
   (GPA) of at least 3.3 in the courses taken to satisfy requirements 1 to 4
   above. In the case of STS majors, the student must compile a GPA of at
   least 3.3 in the entire STS core. If all these requirements are met, the
   designation ‘Honors Program in Science, Technology, and Society’ is
   affixed to the student’s permanent record and appears in the commence-
ment program.

COURSES

(WIM) indicates that the course meets the Writing in the Major re-
quirements.

The STS Web site (http://www-sts.stanford.edu/group/STS/) con-
{}
The material and social conditions of information exchange in the 17th century shaped communication. In Europe, attempts to improve it, e.g., the invention of new, universal languages, and of writing, reading, and translating, and the social identities these ideas, and technology itself changed how people thought of knowledge. The material and social conditions of information exchange in the 17th century, looking at books, instruments, collections, patronage, systems of writing, reading, and translating, and the social identities these systems created. Early discussions of information technology and attempts to improve it, e.g., the invention of new, universal languages, and the utopian visions of communication driving such projects.

123. The Scientific Revolution—What sort of tools do historians use to understand and interpret science? How did science emerge as a distinctive kind of knowledge? The history of science as a field of study, using the Scientific Revolution of the 16th and 17th centuries; the age of Copernicus, Galileo, Kepler, and Newton as a case study in the historical interpretation of science. The intellectual, cultural, and institutional context in which western science emerged. How historians have explained and debated the birth pangs of modern science.

124. American Economic History—(Enroll in Economics 116.)
4 units, Win (Dallal)

125. The Emergence of Modern Medicine—(Enroll in History 13.)
3-5 units, Spr (Findlen)

126. The Prehistory of the Computer—Why trust a machine? The 17th and 18th centuries saw a proliferation of attempts to mechanize human thoughts and actions. The dream of encapsulating tedious calculations in a “black-box” occupied Kepler, Pascal, and a host of scholars in the early modern period, leading to Charles Babbage’s development of the analytical and difference engines in the 1830s. The evolution of such machines, their place in society, their theoretical basis, and the practical limits of the use, emphasizing the changing relationship between the automation of calculation and the simulation of human behavior through automata.

127. Undergraduate Colloquium: Science in the Islamic World—(Enroll in History 290.)
5 units, Aut (Dallal)

131. Bodies and Machines: From Descartes to Frankenstein—What is the history of the relationship between the body and technology? How does the body become dissected, mechanized, and industrialized? How is it made whole with prosthetics or surpassed with instruments? The attempts to represent, replicate, and supplement the body and the mind. What are the idealized fantasies of the body and the mind at different moments in culture? Scientific and artistic images and seminal texts from Descartes to Frankenstein, and instruments (microscopes, memory theaters, and calculating machines).

132. Undergraduate Colloquium: Yesterday’s Tomorrows—Technology and the “Future” in History—(Enroll in History 267.)
5 units (Corn) not given 2000-01

133. Invention of Science—(Enroll in Classics 133.)
4-5 units, Spr (Netz)

135. Stanford Introductory Seminar: Technologies of Civilization, Writing, Number, Money—(Enroll in Classics 22N.)
3-4 units, Aut (Netz)

137. U.S. Communication Policy—(Enroll in Communication 137.)
5 units, Win (Bar)

140. Information Revolutions: Technology and Forms of Knowledge—The relationship between the development of information technologies and intellectual/cultural history from antiquity to the present. Topics: the shift from orality to literacy (and the invention of early alphabets and writing) in early civilization; the influence of printing technologies in the Renaissance, Reformation, and Scientific Revolution; the culture of print in the modern world; technologies of information management and control; computers, the Internet, and the contemporary “age of information.”

145. History of Computer Game Design: Technology, Culture, and Business—Reading, discussion, reports, and projects on the developing culture and technology of computer and video game design. Historical contexts include entertainment media, computing technology, applications of gaming technology, and business history. Topics: play in human culture, early computer games from chess to Spacewar, the role of artificial intelligence research, the history of computer graphics and sound technology, the evolution of techniques and genres of computer game design, video game machines, games and the microcomputer revolution, networked gaming, gadgets and games as factors in the evolution of software and hardware, marketing, gendering of games and game play, virtual worlds, simulation, video and computer game industries, technology transfer (e.g., military simulations).

149. Trials of the 20th Century: Technology, Law, and Culture—Enroll in Cultural and Social Anthropology 85.)
5 units, Aut (Jain)

155. Science, Technology, and Gender—(Enroll in Cultural and Social Anthropology 132.)
5 units, Win (Jain)

162. Computers and Interfaces: Psychological and Social Issues—(Enroll in Communication 169.)
5 units, Win (Nass)

164. The Internet and Social Values—The rapid growth of the Internet has fractured social networks long used by cultures, communities, and individuals for connection and interaction. There are three phases of this phenomenon: infrastructure enablement, productivity enhancement, and cultural changes in communication and learning. Topics: history and design architecture of the Internet; the culture of Silicon Valley venture capital in promulgating technology improvements; economic evolution of telecommunications; individual empowerment; changing computer applications and social values; role of Internet anonymity; dynamic growth of the Internet; conflict between “openness” and “proprietari-ness” in the Internet world. Real world case studies illustrate themes. Prerequisite: basic familiarity with Internet browsing.

3 units, Spr (Siminoff)
229. **Women and Medicine in the United States**—Exploration of ideas about women’s bodies in sickness and health, and women’s encounters with lay and professional healers in the U.S. from the 18th century to the present. Topics: ideas about women’s life cycle and sexuality; the social construction of women’s bodies and physical limitations; the history of birth control; abortion and childbirth; menopause and aging; women as healers, including midwives, lay physicians, and female doctors and nurses. Developments in medical science and technology as they have affected and continue to affect women. Comparison of historical and contemporary experiences of women in relation to medicine, including efforts of women to gain control of their health care.

5 units, Win (Horn)

230. **Technology and Work**—(Enroll in Management Science and Engineering 284.)

4 units (Barley) not given 2000-01

231. **Technology and Work**—(Enroll in Management Science and Engineering 284.)

4 units (Barley) not given 2000-01

233. **Culture and Technology**—(Enroll in Education 306C.)

4 units, Spr (McDermott)

255. **Anthropology of Disasters**—(Enroll in Cultural and Social Anthropology 283.)

5 units, Spr (Jain)

260. **Information Technology in Society: Legal and Policy Perspectives**—Analysis of issues at the interface of law, computer science, and information technology. Topics: intellectual property controversies (e.g., DVD, copyright, and Napster), technological and policy issues around the Internet (e.g., monitoring, access filters, encryption, domain names, and the Digital Divide), and commerce issues (e.g., network security, taxation, and U.S. and European approaches to privacy). The technical, legal, political, and ethical components of the controversies studied. Seminar format, with enrollment limited to 20 advanced undergraduates. Prerequisite: a course in computer science or consent of instructor.

4 units, Spr (Simons)

266. **Communication Policy in Comparative Perspectives**—(Enroll in Communication 166/266.)

4-5 units (Bar) not given 2000-01

279. **Technology, Policy, and Management in Newly-Industrializing Countries**—(Same as Management Science and Engineering 298.)

Technology is seen as the key to development and prosperity in most parts of the world. Building technological capability in newly-industrializing countries at the national and firm level. What makes technology special, government intervention that affects technology, the concept of technology leader and technology follower environments, the transfer of technology from “leader” countries, indigenous technological capability, human capital, culture and innovation, the role of small firms and new enterprises in technological capability. Managing innovation in firms: how innovation is different in technology-followers, organizing for shop-floor innovation, building an innovation culture, the special role of R&D in followers, the role of design, technology strategy for followers. Cases from Korea, India, Brazil, Singapore, and other NICs.

2-4 units (Forbes) not given 2000-01


2-3 units, Aut, Win (Powell)

299. **Advanced Individual Work**

1-5 units, Aut, Win, Spr (Staff)

## RELATED DEPARTMENT OFFERINGS

### AMERICAN STUDIES

152. **American Spaces: An Introduction to Material Culture and the Built Environment**

5 units, Spr (Corn)

### ENGINEERING

1N. **Stanford Introductory Seminar: The Nature of Engineering**

3 units, Aut (Freyberg)

### HISTORY

33A. **The Rise of Scientific Medicine**

5 units (Lenoir) not given 2000-01

133. **The Darwinian Revolution**

4 units (Lenoir) not given 2000-01
262S. Undergraduate Research Seminar: Science and High-Technology in the Silicon Valley, 1930-1980
5 units, Aut (Lenoir)

274A. Undergraduate Colloquium: Body Works—Medicine, Technology, and the Body in Late 20th-Century America
4-5 units, Win (Bender, Lenoir, Taylor)

MATERIALS SCIENCE AND ENGINEERING

159Q. Stanford Introductory Seminar: Research in Japanese Companies
3 units, Spr (Sinclair)

POLITICAL SCIENCE

125. The Rise of Industrial Asia
5 units, Aut (Oi, Okimoto, Oksenberg, Rohen, Rowen)

OVERSEAS STUDIES

These courses are approved for the Science, Technology, and Society major and taught overseas at the campus indicated. Students should discuss with their major advisers which courses would best meet individual needs. Descriptions are in the "Overseas Studies" section of this bulletin or at the Overseas Studies office, 126 Sweet Hall.

BERLIN

117V. The Industrial Revolution and Its Impact on Art, Architecture, and Theory
5 units, Aut (Neckenig)

119V. Architecture and the City, 1871-1990: Berlin as a Nucleus of Modernity—(Same as Overseas Studies 143U.)
4 units, Spr (Neckenig)

120V. Industry, Technology, and Culture, 1780-1945
4 units, Win (Neckenig)

FLORENCE

125V. The Scientific Revolution: From the Renaissance to the 18th Century—(Same as Overseas Studies 215V.)
4-5 units, Win (La Vergata)

214V. Science, Technology, and Art: The Worlds of Leonardo
5 units, Aut (Findlen)

SLAVIC LANGUAGES AND LITERATURES

Emeriti: (Professors) Joseph Frank*, Joseph A. Van Campen; (Assistant Professor) Elisabeth Stenbock-Fermor
Chair: Gregory Freidin
Professors: Lazar Fleishman (on leave), Gregory Freidin, Richard D. Schupbach
Associate Professor: Monika Greenleaf
Assistant Professor: Gabriella Safran
Senior Lecturer: Rima Greenhill
Lecturers: Anindita Banerjee, Serafima Gettys
Visiting Professors: Oksana Bulgakowa, Alan Timberlake, Izaly Zemtsovsky, Viktor Zhivov

* Recalled to active duty.

The department accepts candidates for the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy. Particular requirements for each degree are described below.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

The Department of Slavic Languages and Literatures (Slavic) offers two concentrations for undergraduate majors: Russian Language and Literature, and Russian Language, Culture, and History.

Writing in the Major—All Stanford undergraduates who entered in 1996-97 or thereafter are required by the University to pass at least one writing-intensive course in their field of concentration in order to graduate. Majors in Russian Language and Literature, or Russian Language, Culture, and History, may satisfy the writing requirement by enrolling in and receiving a passing grade in Slavic 146.

Overseas Studies—The department encourages students to enhance their education with a term abroad. For information about the Stanford-in-Moscow program, see the “Overseas Studies” section of this bulletin or the Overseas Studies office. Most credits earned in Moscow can be applied to both undergraduate concentrations. Cultural awareness and language ability are enhanced by living with a Russian family in Moscow.

RUSSIAN LANGUAGE AND LITERATURE

The concentration in Russian Language and Literature is designed for those students who desire to gain a firm command of the Russian language and to study the nation’s literary tradition. Emphasis is placed on the linguistic and philological study of literature, as well as the history of Russian literature and related media in the broader context of Russian culture. Students may explore historically related literary traditions (for example, English, French, German), as well as other related fields. The Russian Language and Literature concentration also welcomes students with an interest in Russian and Slavic linguistics.

Prerequisites—Successful completion of Slavic 51, 52, 53, or the equivalent, as determined by the results of the department placement examination.

Requirements

Candidates for the A.B. degree with a concentration in Russian Language and Literature must complete an additional 52 units according to the following distribution:

- Russian Language—A minimum of 12 units selected from the following Slavic Languages and Literatures courses: 111, 112, 113, 177, 178, 179, 181, 182, 183.
- Russian Literature—The 20-unit core literature sequence consisting of the following Slavic Languages and Literatures courses: 145, 146, 147, 187, 188.
- Electives—Students must take 20 units of electives embracing at least two of the following categories: (1) Russian language or linguistics, (2) Russian literature, (3) historically related literatures. These courses are selected in consultation with the Undergraduate Director. With department permission, work in related academic fields may apply toward the degree requirements.

Majors who concentrate in Russian Language and Literature must earn a grade point average (GPA) of ‘C’ or better in order to receive credit toward the major.

RUSSIAN LANGUAGE, CULTURE, AND HISTORY

The concentration in Russian Language, Culture, and History is for students who would like to obtain a firm command of the Russian language and to pursue a broad, interdisciplinary study of Russian literature, other expressive media (including film), as well as cultural traditions and institutions. Emphasis is placed on the relation of the Russian literary tradition to disciplines that have enriched the historical understanding of Russian literature: primarily history, but also anthropology, communications, political science, and sociology.

Prerequisites—Successful completion of Slavic 51, 52, 53, or the equivalent as determined by the results of the department placement examination.
Candidates for the A.B. degree with a concentration in Russian Language, Culture, and History must complete an additional 62 units according to the following distribution.

**Russian Language**—A minimum of 12 units selected from the following courses or the equivalent: Slavic 145, 146; History 120B and 121. Students must choose one course from Slavic and one course from History.

**20th-Century Russian Literature and History**—A minimum of 8 units chosen from the following or the equivalent: Slavic 147; History 120C. Students must choose one course from Slavic and one course from History.

**19th-Century Russian Literature and History**—A minimum of 8 units chosen from the following courses or the equivalent: Slavic 145, 146; History 120B and 121. Students must choose one course from Slavic and one course from History.

**Electives**—In order to complete the basic degree requirements, students must take 24 additional units of course work embracing at least two of the following categories: (1) Russian language, (2) Russian literature, (3) Russian history. These courses are selected in consultation with the Undergraduate Director. With department permission, work in related academic fields (for example, anthropology, communications, political science, religion, sociology) may apply toward the degree requirements.

Majors with a concentration in Russian Language, Culture, and History must earn a GPA of ‘C’ or better in order to receive credit toward the major.

**MINORS**

The Department of Slavic Languages and Literatures offers three undergraduate minor programs in Russian Language, Literature, and Culture.

The minor program is designed for students who, while pursuing a major in another program, seek a comprehensive introduction to Russian culture, whether primarily through (1) Russian language courses; or (2) a combination of minimal proficiency in Russian and courses in the history of Russian culture; or, (3) courses on Russian literature in translation and, depending on the student’s interest, other forms of the country’s cultural expression as well as its social institutions. Students seeking a Slavic minor are particularly encouraged to take advantage of Stanford’s Overseas Studies Program in Moscow.

**RUSSIAN LANGUAGE**

**Prerequisites**—The minor concentration in Russian Language requires the successful completion of Slavic 1A, 2B, 3C (First-Year Russian) and Slavic 51, 52, 53 (Second-Year Russian), or a demonstrated equivalent competence as determined by the departmental Russian language placement examination.

**Requirements**—Candidates for the A.B. degree with a minor concentration in Russian Language must complete 24 units of Russian language and literature courses according to the following distribution: 12 to 15 units selected from Slavic 111, 112, 113, 177, 178, 179, 181, 182, 183. The remaining 9 to 12 units should be selected from Slavic 145, 146, 147, 187, 188, other monograph courses offered by the Department of Slavic Languages and Literatures or, with the approval of the Department’s undergraduate adviser, in history, politics, linguistics, or other relevant programs.

**RUSSIAN LANGUAGE, LITERATURE, AND CULTURE**

**Prerequisites**—The minor concentration in Russian Language, Literature, and Culture requires the successful completion of Slavic 1A, 2B, 3C (First-Year Russian) or the equivalent as determined by the departmental Russian language placement examination.

**Requirements**—Candidates for the A.B. degree with the minor concentration in Russian Language, Literature, and Culture must complete 28 units according to the following distribution:

1. A minimum of 16 units of courses on literature and culture selected from the following Slavic Languages and Literatures courses: two quarters in the 145, 146, 147 sequence (Russian Literature in English Translation); or one quarter in the 145, 146, 147 sequence and one quarter in the 187, 188 sequence (Russian Poetry; prerequisite: Second-Year Russian); and, at least one monograph course focusing on a single writer.
2. 12 units of elective courses either in the Department of Slavic Languages and Literatures or, with the approval of the Slavic department’s undergraduate adviser, in history, linguistics, politics, or other relevant programs.

**RUSSIAN CULTURE**

Candidates for the A.B. degree with the minor concentration in Russian Culture must complete 36 units according to the following distribution: a minimum of 20 units of courses on literature and culture selected from the following Slavic Languages and Literatures courses—three quarters in the 145, 146, 147 sequence (Russian Literature in English Translation) and two monograph courses focusing on a single writer. In addition, one course in Russian history is selected from History 120B or 120C. No knowledge of Russian is required.

**Electives**—11 units of elective courses either in the Department of Slavic Languages and Literatures or, with the approval of the Slavic department’s undergraduate adviser, in art, history, linguistics, political science, or other relevant programs.

The deadline for minor declarations in all concentrations is no later than the last day of the third quarter before degree completion.

**HONORS PROGRAM**

Students in either concentration with a grade point average (GPA) of ‘B+’ or better in their major courses are eligible to participate in the department’s honors program. In addition to the basic program requirements above, honors students must also complete the following:

1. One advanced course, usually taken during the Spring Quarter of the junior year and related to the area of the student’s expected research. Majors in either concentration who propose a senior project in literature must take a course in literary or cultural theory. Students concentrating in Russian Language, Culture, and History and pursuing a project in cultural history are required to take a course in literary or cultural theory, or a graduate seminar in the area of their topic. Students concentrating in Russian Language and Literature who propose a senior project in Russian language select their course in consultation with the Undergraduate Director.
2. Slavic 199, Individual Work: a minimum of 8 units during the senior year. To qualify for honors, the candidate must receive a grade of ‘B’ or better on the thesis or project completed during this period.

**SLAVIC THEME HOUSE**

Slavianskii Dom, at 650 Mayfield Avenue, is an undergraduate residence that offers a wide variety of opportunities to expand one’s knowledge, understanding, and appreciation of Russian and Eastern Europe.

**COTERMINAL PROGRAM**

The department allows a limited number of undergraduates to work for coterminal A.B. and A.M. degrees in Slavic Languages and Literatures with a concentration on Russian. In addition to University requirements for the A.B. degree, the student must:

1. Submit an application for admission by January 31 of the senior year. Applicants must meet the same general standards as those seeking admission to the A.M. program. Applicants must submit: an application for admission; a written statement of purpose; a transcript; and three letters of recommendation, at least two of which should be from members of the Department of Slavic Languages and Literatures faculty.
2. Meet all requirements for both the A.B. and A.M. degrees. They must complete 15 full-time quarters (or the equivalent), or three full-time quarters after completing 180 units, for a total of 216 units. During the senior year they may, with the consent of the instructors, register for as many as two graduate courses. In the final year of study, they must complete at least three graduate-level courses.
GRADUATE PROGRAMS

MASTER OF ARTS

University requirements for the A.M. degree are discussed in the “Graduate Degrees” section of this bulletin.

Admission—The requirements for admission to the master’s degree program in Russian are:

1. A Bachelor of Arts degree (or its equivalent) from an accredited college or university.
2. A command of the Russian language sufficient to permit the student to do satisfactory graduate work in an area of specialization.
3. A familiarity with Russian literature sufficient to permit the student to perform adequately in courses at the graduate level.

The applicant’s previous academic training in Russian language and literature must normally serve as a tentative indication of competence. Accordingly, the department does not ordinarily consider applications from students who have not had at least three years of college Russian and some undergraduate training in Russian literature of the 19th and 20th centuries.

Before registering for the first quarter’s work in the department, entering graduate students are required to take placement examinations in language and literature. Students who fail to perform satisfactorily on such examinations must register for remedial courses in the areas in which they are deficient. Such remedial courses, normally completed within the first three quarters of residence, carry no credit toward either the A.M. or the Ph.D. degree.

Course Requirements—Candidates for the A.M. who are not also candidates for the Ph.D. should plan course work that ensures adequate preparation for the A.M. final examination at the end of the third quarter of work. Ph.D. candidates should attempt to include as many of the department’s basic course offerings as possible in the first-year program to ensure sufficient time to complete the A.M. thesis during the fifth quarter of registration. In any case, course work should be planned in consultation with the graduate adviser, whose written approval of the overall course load is required.

Candidates for the A.M. must complete a program of 36 units, of which 27 units must be selected from courses given by the department. The other 9 units may, with approval of the candidate’s adviser, be selected from courses in related fields. Of the 27 units in the department, a minimum of 9 must be in language and a minimum of 9 in literature. The remaining 9 units may be distributed in accordance with the needs and interests of the student, and with the advice and approval of the department adviser.

No credit toward the A.M. degree is allowed for first- or second-year courses in non-Slavic languages required for the Ph.D. degree.

The A.M. Thesis—A requirement for candidates for a Ph.D., the A.M. thesis represents a complete article-length research paper (6,000-9,000 words) that, in both form and substance, qualifies for submission to English language professional publications in the Slavic field. The A.M. thesis must be submitted to the thesis adviser no later than the fifth quarter and approved no later than the sixth quarter of registration.

Final Examination—Students not enrolled in the Ph.D. program may either submit an A.M. thesis or take a final examination. In the latter case, regardless of the area of specialization, the student must demonstrate in a written examination: (1) command of the phonology, morphology, syntax, and lexicology of contemporary Standard Russian sufficient to teach beginning and intermediate courses at the college level; (2) an ability to read contemporary Standard Russian sufficient to assist students studying contemporary Russian poetry or literary prose; and (3) sufficient familiarity with Russian literature of either the 19th or 20th century to handle successfully survey courses dealing with a chosen period of specialization.

The examination should be passed at the end of the final quarter of required course work.

MASTER OF ARTS IN TEACHING

The degree of Master of Arts in Teaching is offered jointly by the department and the School of Education. It is intended for candidates with a teaching credential or relevant teaching experience who wish to further strengthen their academic preparation. Requirements for the degree are outlined in the “School of Education” section of this bulletin. The program includes 45 units, of which 25 must be in the teaching field and 12 in education. Specific language requirements are established in consultation with the department.

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. are discussed in the “Graduate Degrees” section of this bulletin.

Students enrolled in the Ph.D. program in Slavic Languages and Literatures are expected to fulfill the following requirements:

1. Minor or Related Fields: during the course of study, students must develop substantial expertise in a field contiguous to the area of specialization. A candidate may elect to present a full minor or, in consultation with the graduate adviser, develop a special program in a related field.
   a) Related Field: a student is required to complete a sequence of basic courses (12 units) in a chosen discipline outside the Department of Slavic Languages and Literatures. The choice of patterns is one of the following:
      i) A sequence of three courses in one West European literature, selected in consultation with the adviser, or
      ii) two basic courses in comparative literature to be selected in consultation with the graduate adviser and the Department of Comparative Literature.
   b) Minor: if the student elects a minor (for example, French, German, Spanish, or Russian history), he or she should take six graduate courses in that department with a minimum of 20 units at the graduate level, according to the minor requirements established by that department. Students considering minors in other areas, such as Asian languages, English, or comparative literature, should consult with the adviser, the Chair of the Department of Slavic Languages and Literatures, and the chair of the minor department. Students who wish to enroll in the Graduate Program in the Humanities should apply there.

2. Admission to Candidacy: candidates should read carefully the general regulations governing the degree, as described in the “Graduate Degrees” section of this bulletin. No student is accepted as a candidate until the equivalent of the A.M. degree requirements, including the A.M. thesis described above, are completed. (Ph.D. students in literature may not opt for a written examination.) Admission to candidacy is determined by the end of the fifth quarter of graduate study. The candidate by that time must have demonstrated commitment to graduate studies by completion of a minimum of 60 quarter units of credit and with a grade point average (GPA) of 'B+' or better. Candidates must (1) submit to the graduate adviser copies of three seminar papers completed in the Department of Slavic Languages and Literatures, and (2) submit a complete draft of an A.M. thesis. Failure to comply with the above requirements results in termination of enrollment for the Ph.D. degree. The terminated student may, at the discretion of the faculty, be given the opportunity to take the A.M. written examinations. If successful, the student is then awarded the A.M. degree, but is not accepted as a candidate for the Ph.D. degree.

3. Proficiency Test: administered for all entering graduate students, this test determines whether the student’s knowledge of Russian language and literature falls below the department’s standard. Students who fail to excel in this test are asked to complete appropriate courses in the first year of graduate study.

4. Course Requirements: before qualifying for the department oral and written examinations, a Ph.D. candidate is expected to accumulate at least 72 quarter units of credit for courses taken while in graduate school. No less than half of this course work (36 units) must be done in the Department of Slavic Languages and Literatures, including at least 12 units of credit for seminar-level courses. (All entering grad-
graduate students are expected to enroll in Slavic 200.) The candidate must submit to the department's Academic Progress Committee three seminar-level papers completed at the Department of Slavic Languages and Literatures, as well as the A.M. thesis.

5. Foreign Languages: a candidate must demonstrate reading knowledge of French and German by passing written examinations.

6. Examinations: a candidate must pass the departmental general qualifying examinations. The written part covers:
   a) The history and structure of the Russian language and its relationship to the other Slavic languages. (Students are excused from this portion of the examination if they have completed Slavic 211, 212, and 213 with a grade point average (GPA) of 'B-' or better.)
   b) The history of Russian literature, including its relationship to the development of other Slavic literatures, or West European literature, or to Russian intellectual history.

   The oral portion follows shortly after the successful completion of the written portion. The departmental oral examination is designed to test the students' knowledge of the major cultural and literary trends in a period of their choice. It can be used most profitably as an opportunity to do intensive reading in the period of a candidate's projected dissertation work. Preparation for the oral should begin immediately following the successful completion of the department's written examination. After consulting with members of the faculty, the student proposes a reading list, which, once approved, serves as the basis for the examination. The exam structure requires that the student make an open presentation on a topic or set of topics of particular interest or relevance to the period in question. After an open discussion of the presentation, each examiner is given the chance to question the student on other topics related to the reading list.

   Following the department examinations, a candidate must pass a University oral examination which is a defense of a dissertation proposal covering content relevant to the area of study, rationale for the proposed investigation, and strategy to be employed in the research.

   Specialization—Candidates in Slavic Languages and Literatures specialize in literature and related media. Candidates may draw up individual programs of study and research in consultation with the graduate adviser. Requirements vary according to the nature of the specialized program requested.

   Continuation—Continuation in the Ph.D. program is contingent on:
   a) A high quality of performance in course work (decided by department evaluation); for second-year students, an A.M. thesis requested.
   b) The departmental general qualifying examinations must be taken by the end of the first quarter of the third year of study; they may be taken during the second year if the student and the adviser feel this is appropriate. During the two quarters following the general qualifying examinations, the student should be concerned primarily with preparation for the University oral examination, which should take place no later than the end of the third quarter of the third year. However, students may, if necessary, do limited amounts of course work not directly related to the dissertation proposal. The fourth year should be devoted to completion of the dissertation.

2. Students possessing the equivalent of the Stanford A.M. are normally expected to adhere to the schedule for the second, third, and fourth years of work outlined under item 1 above.

3. Students in the Ph.D. program are required to do four quarters of teaching in partial fulfillment of the requirements of the Ph.D. degree; three quarters of first-year Russian, and one quarter of literature as a teaching assistant to a faculty member (usually for one of the survey courses in translation: 145, 146, 147). While teaching a section of first-year Russian supervised by a faculty member, students are required to enroll in the department's teaching colloquium (Slavic 206A, B, C). In addition, students must enroll in Slavic 207D, the department's TA preparatory course, which is offered to all graduate students in the Spring Quarter preceding their first quarter of language teaching. While enrolled in Slavic 207D, students participate in actual language teaching sections.

   Non-Slavic Language Requirements—Credit toward either the A.M. or the Ph.D. degrees is not given for first- or second-year courses in non-Slavic languages. It is assumed that, on entering the program, the student has a reading knowledge of both German and French or, at the very least, one of these languages. The reading examination in one of these languages must be passed by the end of the first year of study. The reading examination in the second language must be passed by the end of the second year of study. Both language examinations must be passed before the candidate takes the University oral examination, that is, before the end of the third year.

JOINT Ph.D. IN SLAVIC LANGUAGES AND LITERATURES AND HUMANITIES

The Department of Slavic Languages and Literatures participates in the Graduate Program in Humanities leading to the joint Ph.D. degree in Slavic Languages and Literatures and Humanities. For a description of that program, see the "Interdisciplinary Studies in Humanities" section of this bulletin.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

(AU) indicates that the course is subject to the University activity unit limitation (8 unit maximum).

For additional offerings in literature, see the "Comparative Literature" section of this bulletin.

Students interested in languages not listed should contact the Special Language Program in the Division of Languages, Cultures, and Literatures.

GENERAL

This curriculum covers topics of general interest. Courses are open to all students and have no prerequisites. Some courses may be taken for graduate credit. Additional work in the original language may be arranged with individual instructors.
The courses:
1. Introduce students to the major authors and texts in the Russian literary and cultural tradition.
2. Offer broad conceptual frameworks for understanding the material covered.
3. Demonstrate the dynamic interaction between cultural texts and a variety of contexts (literary, intellectual, and socio-political).

While these goals are pursued to some extent in all of the courses, the general curriculum may be roughly classified according to contextual emphasis to assist students in choosing courses according to their interests.

Literary Movements and Genres: Slavic 145, 146, 147, 155, 156

Literature and Intellectual History: Slavic 151, 190

Literature and Social History: Slavic 141, 149

Media, Gender, Ethnicity: Slavic 148, 152, 154, 158, 161, 162, 163, 165, 166, 167, 168, 221

13N. Stanford Introductory Seminar: Russia, Russian, Russians—Preference to freshmen. The political and cultural history of Russia and the Russians: prominent persons, prominent events, and how these shape current attitudes and society. Five or six short works by famous Russian authors are analyzed/discussed. GER:3a (DR:7)

3-4 units, Spr (Schupbach)

14N. Stanford Introductory Seminar: Oedipus in Russia—Identity Narratives and Generational Conflict in Modern Russian Fiction and Film—Preference to freshmen. Discuss/analyze Freud’s rendering of the Oedipus story by confronting it with the treatment of identity confusion and generational rivalry in modern Russian fiction and film, against a background different from both Freud’s Vienna and Sophocles’ Athens. Can literature and art be seen as an elaboration of the Oedipus Complex with the social displacing the psychological; can Freud’s Oedipus been seen as a displaced elaboration of a modern social drama of dislocation and multiple identity? Works: Freud’s *The Origins of Psychoanalysis*, *Totem and Taboo*, *Moses and Monotheism*, Turgenev’s *Fathers and Sons*; Chekhov’s *Seagull*, *The Cherry Orchard*, *The Seagull*, *Babel’s Red Cavalry*, and *Babel’s Red Cavalry*.

5 units, Spr (Zemtsovsky)

105A/205A. Russian Jewish Music—Focus is on the music of Russian Jewry, emphasizing the pleiad of Russian-Jewish composers, performers, and musicologists who were united under auspices of the Society for Jewish Folk Music (1908-26). The historical background of the Society and the unique variety of its activity, recreating the sound universe of Russian Jewry.

5 units, Spr (Schupbach)

133A/233A. Deviating from Dogma: Film in East Europe from 1956 to 1968—Filmmakers in the Soviet Union, Poland, Hungary, Czechoslovakia, Yugoslavia, and the German Democratic Republic. The films of Andrei Tarkovsky, Andrzej Wajda, Miklos Jansco, Milos Forman, Vera Chytilova, and Konrad Wolf try to break the old canon of representation (the legacy of Social Realism or Ufa) in connection with political and cultural changes in their countries and under the influence of international filmic development (from Italian Neorealism to French nouvelle vague).

4 units, Spr (Bulgakova)


not given 2000-01

143/243. Early Russian Art and Architecture, 1050-1725—(Enroll in Art History 107A/207A.)

4 units, Spr (J. Kollmann)

145/245. The Age of Experiment (1820-1850)—After the Napoleonic wars, the Russian Empire made an accelerated leap into European culture. Russian authors grappled in formally innovative ways with modern problems of individual and national identity; the invention of history; memory, repression, and lying; urban alienation and the flair for irony and the surreal that accompanies it. Topics and texts: experiments in genre (Pushkin’s “novel-in-verse” *Eugene Onegin*, Gogol’s “poem-in-prose” *Dead Souls*); exploration of the Russian/Oriental psychological and geographic border (Pushkin’s *The Prisoner of the Caucasus*, Lermontov’s *A Hero of Our Time*); the invention of the surreal capital at the empire’s heart (Pushkin’s *The Bronze Horseman* and *The Queen of Spades*, Gogol’s *The Petersburg Tales*, and Dostoevsky’s *The Double*); Tolstoy’s deceptively innocent childhood memoir; and Dostoevsky’s
“notes” on his own descent into the inferno of the Siberian labor camps and his own consciousness. GER:3a (DR:7)
3-4 units, Aut (Greenleaf)

146/246. The Age of Transgression: Russian Literature from Turgenev through Tolstoy—In the half-century before the Russian Revolution, educated people began to debate the reform of human behavior. Censorship inspired some to conceal political messages in fiction. They wrote about murderers, adulterers, and terrorists whose transgressions challenged social, ethical, and aesthetic boundaries. Readings: three novels that portray the modern city as the locus of crime and self-invention, Dostoevsky’s Crime and Punishment; Tolstoy’s Anna Karenina, and Bely’s Petersburg, and some provincial texts by three masters of short forms, Turgenev, Leskov, and Chekhov. GER:3a (DR:7) (WIM)
4 units, Win (Safram)

147/247. The Age of Revolution: Russian Literature and Culture since 1917—Open to all undergraduates; graduate students may receive credit for a research paper as part of 247. A survey of Russian culture, emphasizing literature in the context of Russia’s Soviet and post-Soviet history. Russian modernism; the role of literature and the arts in the creation of Soviet civilization; literature in opposition; Russian culture after communism. Texts in English translation. GER:3a (DR:7)
3-4 units, Spr (Freidin)

148/248. The Factory of the Eccentric Actor (1921-1929): Between Theater and Film, Avant-Garde and Trivial Genres, East and West—The experimental group FEKS was founded in 1921 in Petrograd and worked in theater and film until 1929. They developed a specific system of actor training, near to Meyerhold’s biomechanics, and collaborated with Russian Formalists. Revolution was conceived by the FEKS as a carnival, and the avant-garde had to assimilate trivial genres. FEKS practiced in their films “defamiliarization” of the Russian classics by using the stereotypes of German and American cinema. Gogol’s Overcoat was staged as a German expressionist film, the uprising of Russian aristocrats against the monarchy in 1825 as a melodrama with the elements of the American Western and the Gothic novel. Recommended: knowledge of Russian.
not given 2000-01
4 units, Aut (Banerjee)

149/249. Technoscience and Russian Culture—Designed for students with an interest in science and technology who wish to reflect on how scientific insight and technological change can influence culture. The varied and often controversial ways Russian culture responded to the challenges presented by science and technology. Focus is on Russian literary, historical, and philosophical texts from the 18th to the end of the 20th century, including visual media and the Internet.
4 units, Win (Greenleaf)

151. Dostoevsky and His Times—Open to juniors, seniors, and graduate students. Major works in English translation with reference to related developments in Russian and European culture and intellectual history. Lectures and discussion section. GER:3a (DR:7)
4 units, Win (Frank)

4 units, Win (Bulgakowa)

154/254. History of Russian Theater—Survey of the history of Russian theater from the beginning to its contemporary state.
4 units, Aut (Bulgakowa)

155/255. Anton Chekhov and the Turn of the Century—Chekhov’s art in its Russian literary, historical, philosophical, and political contexts. Primary readings from Chekhov’s short stories and major plays; supplemental readings for graduate students from Chekhov’s letters and works by his friends and contemporaries, such as Leskov, Tolstoy, Korolenko, and Gorky. GER:3a (DR:7) not given 2000-01

156/256. Nabokov and Modernism—(Same as Comparative Literature 156D/256D.) Stories, novels, and film scripts in the context of other modernist writers (Bergson, Proust, Joyce), media (photography and film), and 20th-century events and intellectual discourses (Marxism-Stalinism, avant-garde, Freudianism, American postwar cultural ideology), whose influences Nabokov belittled or ignored. Critical approaches that elude the author’s control. Readings: Despair, Camera Obscura, The Gift, Bend Sinister, Lolita, Pale Fire, excerpts of Eugen Onegin’s Commentary and Speak Memory. GER:3a (DR:7)
3-4 units, Spr (Greenleaf)

158/258. Sergei Eisenstein—His vision of film theory, and its main theoretical models. Explore radical innovations of the medium through analysis of his major films (Strike, Battleship Potemkin, October, The General Line, Que viva Mexico!, Alexander Nevsky, and Ivan the Terrible): new modes of narration, editing, and acting; audiovisual synchronization; and deep-focus composition and an unfolding foreground of the film image. Interrelates film-poetics with other arts of the Avant-Garde era (Futurism and Cubism in painting, Constructivism in architecture and theater, new schools of expressive movement in ballet, the modernist literary experiments of Joyce). Eisenstein creates for these films a rich systematic context that includes new theories in psychology and psychoanalysis, linguistics, and anthropology.
not given 2000-01

161/261. Poetess: The Grammar of the Self when the Poet is a Woman—(Same as Comparative Literature 161/261.) Seminar. Readings of lyrical works by women poets from the U.S., Russia, Eastern Europe, and Germany (Dickinson, Moore, Brooks and the Harlem Renaissance, Bishop, Akhmatova, Tsveetaeva, Sachs, Plath, Cisneros, Angelou, Graham, Howe, and Szymborska). The historical and cultural context enriches our understanding of such theoretical and practical issues as “breaking and entering” the male preserve of “high poetry” in different eras; the interaction of written and oral, political and performative modes of expression; new representations of the feminine body and experience in the visual arts; and the development of a female lineage and modes of poetic legitimation, association, and inspiration. GER:3a (DR:7)
4 units, Win (Greenleaf)

162/262. Gender Images in Film—Film creates permanent new images of femininity. One of its conscious prerequisites is the notion of social stereotypes, whose alternation is caused by the arrival of a new historical epoch. The development of enduring images of the film heroine, 1914-90, through a comparison of the Russian, American, and W. European cinema, and analytical approaches to them from feminist film theory. not given 2000-01

163. Beyond Fiddler on the Roof: The Jewish Experience in Eastern Europe through Literature and Film—Though nostalgic stereotypes suggest that the lives of E. European Jews changed only when interrupted by revolution, emigration, or Holocaust, literary texts depict a constant interplay of rebellion and reaction; though some imagine Jewish communities as isolated, authors showed interactions among Jews and non-Jews. Readings: Yiddish prose by Sholem Aleikhem, I. L. Peretz, I. B. Singer, and poetry by Moyshe-Leib Halpern and AnnaMargolin; Russian works by Osip Mandelstam, Isaac Babel, and Felix Roziner; Polish texts by Bruno Schulz, Hanna Krall, and Eliza Orzeszkowa; and four films in Russian, Polish, Yiddish, and English. GER:3a (DR:7) 4 units, Aut (Safram)
not given 2000-01

166/266. Russia on the Silver Screen: U.S., Western European, and Émigré Cinema—The fantasy of “Russia” in German, French, and American cinema, 1920-90. Films created by Russian émigrés in Berlin, Paris, and Hollywood as odd models, constructing the imaginative national identity according to different cultural stereotypes of “Russian.”
not given 2000-01

167/267. Models of Film Analysis—Introduction to the aesthetics of film, its topics, the basic principles of film form, and different approaches to them. The objects of study are fictional and non-fictional (American, E. and W. European) films, the genre-system narrative and non-narrative films; the artistic possibilities of primary film technique (mise-en-scene, image, editing, and sound); and different models of analysis (structuralism, psychoanalysis, feminism).
not given 2000-01

168/268. Documentary Film and Fiction in Russian and Western Cinema, 1920 to the Present—Documentary films from Dziga Vertov and Robert Flaherty to the present. The marks and conventions of “documentary” and “fiction” in different periods, the “impression of reality,” the technique of its representations, and “boundary works” between genres.
not given 2000-01

169. Seminar: Voice and Literature in Russia and America—Introduction to the comparative study of literature through voice and text. In the modern era, prose and poetry have drawn from the productive tension between the spoken words and the objectification of language in writing. The shifting relationships between these modes of expression and the changing representation of voice in textual forms of social and cultural identity (gender, race, class, nation) and the notion of literature itself. Concepts from theoretical readings are explored in active dialogue with literary texts from several national traditions and genres.
not given 2000-01

190. Modernism and the Humanities: Tolstoy’s Anna Karenina and the Social Thought of Its Time—A “close reading” of Tolstoy’s novel in historical context, followed by a discussion of the novel as a polemic with contemporary social thought: Marx and Engels, John Stuart Mill, Nietzsche, Freud, Emile Durkheim, and Max Weber. Confrontation of modernity and tradition, changes in the institution of family, the question of gender and sex equality; rational thought and religious sentiment, the crisis of authority and legitimacy; charisma and routinization; the rise of individualism, estate society vs. class; capital and the modern city; autonomy of art and ideological engagement. GER:3a (DR:7 or 8)
not given 2000-01

221. Modernism and the Jewish Voice in Europe—Some of the most haunting literary voices of the 20th century emerged from the Jewish communities of Eastern and Central Europe. The Jewishness of the modernists is thematized, asking whether it contributed to shared attitudes toward text, history, or identity. Their works are situated in specific linguistic traditions: Yiddish, Hebrew, Russian, Polish, or German. Primary readings from Ansky, Bialik, Mendelsblatt, Babel, Schulz, Kafka, Celen, etc.; secondary readings in history, Eastern European literature, and theory, including Marx, Freud, Benjamin, and Arendt.
not given 2000-01

LANGUAGE PROGRAM

By special arrangement with the department, courses numbered 100-159 can be taken for graduate credit. Students are urged to take all three quarters of first-, second-, and third-year language series consecutively in the same academic year.

FIRST- AND SECOND-YEAR LANGUAGE

Note—Students registering for the first time in a first- or second-year course must take a placement test if they had any training in Russian before entering Stanford. All entering students must take Part I (written) of the placement test on-line during the summer, followed by Part II (oral), to be administered on campus 9/24/00. Consult the Stanford Language Center for further information, or see http://language.stanford.edu.

3-5 units, Aut, Win (Gettys, Staff)
Spr (Staff)

2D. Accelerated Beginning Russian—Covers first two quarters of first-year Russian in one quarter.
not given 2000-01

50. Review of Russian Grammar: Repair Russian—“Mainstreams” the skills of students who do not fit easily into the basic language program, e.g., those whose performance on the Placement Exam is not sufficient to justify placement in 51, or native speakers of the language whose reading and writing skills are impaired, etc. Students successfully completing 50 normally proceed directly into 52; others, particularly “heritage” speakers may enter 112 or 178.
3-5 units, Aut (Staff)

51,52,53. Second-Year Russian—Reviews the more difficult areas of the grammar, e.g., numbers, verb conjugation, and aspect, etc.; enriches the students’ vocabulary and understanding of the language; and improves their speaking skills.
5 units, Aut (Greenhill, Staff)

52.—Continuation of 51.
5 units, Win (Greenhill, Staff)

53.—Continuation of 52, with an emphasis on Russian history.
5 units, Spr (Greenhill, Staff)

52B. Second-Year Russian—For students returning from the Overseas Studies Program in Moscow.
5 units, Win (Schupbach)

99. Language Specials—With consent of department only. See instructor for section number.
1-5 units, Aut, Win, Spr (Staff)

111,112,113. Third-Year Russian

111.—Emphasis is on grammar, writing, and conversation. Grammar is presented through readings from an edited version of The Golden Calf (the Chmielnik, and Evgenij Petrov), a humorous and “right-on” view of the Russians at their best and worst. Conversation emphasizes material from contemporary Russian periodicals, films, music, radio, and TV programs.
4 units, Aut (Schupbach, Staff)

112.—See 111.
4 units, Win (Schupbach, Staff)

113.—See 111.
4 units, Spr (Gettys, Staff)
117A, B, C. Russian for Native Speakers—"Self-paced," for students who have grown up in Russian-speaking homes, perfecting reading and writing skills in Russian and the ability to communicate in formal and informal settings. Supports students in retaining and enhancing their existing abilities. not given 2000-01

119A. Technical Translation—Problems of translation of the technical language are discussed against the background of contemporary texts on geology and geophysics. Prerequisite: at least third-year Russian. not given 2000-01

119B. Belletristic Translation—Focus is on the "voice" of a variety of 20th-century authors including Gorkij, Solzhenitsyn, and Bulgakov. Prerequisite: at least third-year Russian. not given 2000-01

120. Advanced Russian for Students of the Physical Sciences, Mathematics, and Engineering—Develops reliable reading skills in the Russian technical language, emphasizing mathematics and the physical sciences. not given 2000-01

177, 178, 179. Fourth-Year Russian—Interactive mini-course in culture, history, and current events. Films, readings from classical and contemporary writers, newspaper articles, documentaries, radio and TV programs, and music. Discussions, role-playing, and creative assignments improve oral and written skills. Review and "fine-tuning" of grammar and idiomatic usage. Prerequisites: 111-113, or equivalents.

177.—Russian society and culture.
3 units, Aut (Greenhill)

178.—America and Europeans through the eyes of Russians. Serious and humorous look at how Russians viewed us through this century.
3 units, Win (Greenhill)

179.—The mass media on post-Perestroika Russian society (economy, youth problems, music, film and theater, humor, generation gap, the "New Russians").
3 units, Spr (Greenhill)

181, 182, 183. Fifth-Year Russian

181, 182, 183. The Russians: What Makes Them Different?—Language proficiency maintenance for undergraduates and graduates with four years of Russian or equivalent; appropriate for majors and non-majors with language experience overseas. Content-based advanced language skills are expected for conducting discussions, oral presentations, and writing essays on important issues on contemporary Russia. The Russians’ world: outlook; "folk" psychology; the way Russians see themselves and the rest of the world in ways, habits, and traditions through contemporary prose, newspaper articles, films.
3 units, Aut, Win, Spr (Gettys)

199. Individual Work—Open to Russian majors or students working on special projects. May be repeated for credit. Prerequisite: consent of instructor.
1-5 units, any quarter (Staff)

206A, B, C. Practicum in Teaching Russian as a Foreign Language—Curriculum and lesson planning. Observation and discussion of classroom techniques in conjunction with teaching beginning Russian. (AU)
1-2 units, Aut (Gettys, Schupbach)
Win, Spr (Gettys)

207D. Introduction to Teaching Russian as a Foreign Language—Practical approach to teaching Russian to non-native speakers, focusing on a survey of the features of Russian which present particular difficulties for students. A survey of the Slavic Languages from the standpoint of Russian. Preparation of lessons for classes and tutoring of an individual learning to speak Russian.
3 units, Spr (Gettys, Schupbach)

299. Individual Work—For graduate students in Slavic working on theses or engaged in special work. Prerequisite: written consent of instructor.
1-12 units, any quarter (Staff)

ADVANCED UNDERGRADUATE AND GRADUATE

115. Humor and Russian Literature—The history of Russian literature from the standpoint of the humor that it contains, from Old Russian times to the present. Lectures are in English and may be taken separately from the discussion sections. (In Russian) not given 2000-01

127/227. Boris Pasternak and the Poetry of the Russian Avant Garde—Pasternak’s works are examined within a broad cultural context to identify and analyze characteristic features of the Russian avant garde poetics. Readings in Russian.
not given 2000-01

129/229. Poetry as System: Introduction to Theory and Practice of Russian Verse—The history and theory of Russian versification from the 17th to the 20th century. GER:3a (DR:7) not given 2000-01

170B/270B. Pushkin in the Romantic Context—How Pushkin used current European aesthetic and literary discourses to fashion and refashion autoportraits in ironic and dynamic interaction. A theoretical and comparative textual framework is derived from comparative literature’s study of Romanticism, integrating a variety of perspectives. Topics: the “fragment” as the quintessentially modern poetic genre; the morbid elegy as the “genre of entry” for young poets; the real narrative innovations of Byronism; Russian male “identity” and disempowerment through the oriental erotic tale; Pushkin’s use of Shakespeare’s chronicles plays to rewrite Karamzin’s history of Boris Godunov, and his renovation of Gothic conventions for Russian uses; the ability of the concept “Romantic irony” to shed new light on Eugene Onegin, “Egyptian Nights,” and Pushkin’s relation to Romanticism.
not given 2000-01

185/285. Writing Russia in the Age of Catherine the Great—The Enlightenment’s boldest experiment: Catherine the Great’s use of western “regimes of description” (textual and visual) to imagine a legal Russian state, interactive public spheres and literary culture, and the parameters of the Russian subject’s interior domain. Catherine’s own writings, from Shakespearean comedies at the heart of her conception of a national theater, to her fantasy-impersonations of Europe’s ideal monarch and her boundary-crossing Autoportrait read in the context of late 18th-century Russian writers’ efforts to produce Golden Age Culture.
not given 2000-01

186/286. 18th-Century Russian Literature—Lecture/seminar examining period literature (poetry, prose, and drama) in its specific cultural and historical context, with an emphasis on the creation of “modern Russian literature” as a social institution. The generic diversity of Russian literature and its relation to Western European models. Close reading of selected works by major authors, including Lomonosov, Derzhavin, and Karamzin. Discussions in English, readings in Russian. Prerequisite: good reading knowledge of Russian.
not given 2000-01

187. Russian Poetry of the 18th and 19th Centuries—Required of all majors in Russian literature and literature; open to undergraduates who have completed three years of Russian, to graduate students. The major poetic styles of the 19th century as they intersected with late classicism, the romantic movement, and the realist and post-realist
188. From Alexander Blok to Joseph Brodsky: Russian Poetry of the 20th Century—Required of all majors in Russian literature. Development in Russian poetry of the 20th century including Symbolism, Acmeism, Futurism, and literature of the absurd from Zinaida Hippuis and Andrey Bely to Marina Tsvetaeva and Joseph Brodsky. Emphasis is on close readings of individual poems. Discussions in Russian. GER:3a (DR:7) not given 2000-01

189/289. Literature of Old Rus' and Medieval Russia—From the earliest times through the 17th century. Lectures on the development of literary and historical genres and on links between literature and art, architecture, and religious culture. Readings in English; graduate students read in the original.
4 units, Spr (Zhivotov)

194A,B. Russia and The Other: A Cultural Approach
194A.—Seminar for students returning from Moscow and required of Slavic majors working on an honors thesis. Recommended for Slavic majors and minors. Russian cultural identity and its emergence in literature and art dealing with the Other (Western Europe; the Orient including Central Asia, Siberia and the Caucasus, and various marginal groups, e.g., Jews, Gypsies, and even American students of Russian). Close reading of important works of literature and other cultural texts; introduction to literary analysis, cultural and social theory. Class presentation.
4-5 units, Win (Freidin, Safran)

194B.—For students who choose to develop their ideas further by doing additional research and writing a scholarly paper (possibly an honors thesis in Slavic literature or related field). Class presentation and research paper. Prerequisite: 194A.
2-3 units, Spr (Freidin, Safran)

195/295. The History and Structure of Modern Russian—The major changes in the structure of the Russian language over the last millennium: interaction with Old Church Slavonic, sound changes, simplification of the noun, the rise of verb prefixation and the modern system of aspect, and stylistic differentiation and interaction. Prerequisite: three years of language study, or consent of the instructor.
3-4 units, Aut (Schupbach)

198. Comparison of Russian and English—The ways in which these two languages are similar and different. Starting from Old English and Old Russian, what events have led to their present structures and interaction.
not given 2000-01

199. Individual Work—Open to Russian majors or students working on special projects. May be repeated for credit. Prerequisite: consent of instructor.
1-5 units, any quarter (Staff)

200. Proseminar in Literary Theory and Study of Russian Literature—Required of first-year graduate students in Slavic. Introduction to graduate study in Slavic languages and literatures. Discussion of the profession, discipline, and literary theory complement theoretical readings and practical exercises in versification and narrative analysis.
4 units, Aut (Greenleaf)

200A. Introduction to Library and Archival Research in Slavic Studies—Familiarizes students with major Western language sources and search methodologies pertaining to the Russian and E. European area studies. Recommended: knowledge of Slavic languages.
not given 2000-01

211. Introduction to Old Church Slavic—Introduction to the grammar of Old Church Slavic, the first written language of the Slavic peoples. Brief survey of grammar, selected texts. Primarily a skills course, with attention to the historical context of Old Church Slavic.
3 units, Win (Timberlake)

212. Old Russian and Old Church Slavic—Continuation of 211. Readings in additional canonical Old Church Slavic texts, following the Church Slavic tradition as it develops in early Rus (Kiev, Novgorod). Selections from the Primary Chronicle, Boris and Gleb, The Life of Theodoresius. The general issues of writing and the reception of Byzantine culture in early Rus.
3 units, Spr (Timberlake)

213. History of the Russian Literary Language—Major structural and semantic changes from the 10th to the 19th centuries. Prerequisites: 211, 212.
not given 2000-01

223A,B. Graduate Seminar: Russian Literature and the Literary Milieu of the NEP Period—The Problem of Authorship (1921-1928)—Texts (primarily journal fiction and criticism) deal with the problem of authorship and are examined in the contemporary literary and socio-historical context. Emphasis is on non-Party authors (Babel, El’kin-baum, Mandelstam, Olesha, Tynianov, Zamiatin, and Zoshchenko).
not given 2000-01

225. Readings in Russian Realism—Open to graduate students and advanced undergraduates. Russian Realist and Naturalist prose emerged in a historical context that fostered specific ideas about the function and form of the literary word. Readings from Turgenev, Goncharov, Leskov, Saltykov-Shchedrin, Dostoevsky, Garshin, Tolstoy, Chekhov, Gorky, Bunin. Discussions in English.
4 units, Aut (Safran)

not given 2000-01

230C. 20th-Century Russian Literary Theory from Symbolism and Formalism to Semiotics—Survey of Russian theoretical works on literature. The scholarship of Alexander Vesebovsky, Potebnia; theories of Symbolism and Formalism. Symbolist authors (Bely, Blok, Bryusov, Vyacheslav IV. Ivanov) are seen in the fusion of their theoretical and poetical work, as the Formalists' school is understood in its correlation to post-Symbolist (Futurists and Acmeist) poetical movements. Postformalist studies of the '30s and '40s (Bakhtin, Florensky, Freidenberg, Polivanov, Prop, etc.) in their relation to contemporary studies of the Prague Circle and the later Moscow-Tartu semiotics school.
not given 2000-01

240A,B. Topics in Soviet Civilization: Stalinist Culture in Soviet Russia, 1928-1990—Seminar on the Stalin era: the First Five-Year Plan, the Great Retreat and the Great Terror of the second half of the 1930s, the cataclysm of WW II, and the culture of High Stalinism in the postwar period, providing the vicesitudes of an aesthetic and ideological system that was characterized by certain fixed elements and that witnessed significant variations over time. Analysis of artifacts of Stalinist culture (primarily works of literature, visual arts, and film) in relation to the institutions and elites that produced them and the audiences for which they were intended. The interplay of "texts" (written, visual, and otherwise) and contexts (historical, social, political) is informed by an eclectic set of theoretical perspectives, drawn from the humanities and social sciences. Second quarter consists of guided research and bi-weekly
meetings devoted to discussion of individual research projects. Recommended: knowledge of Russian.

not given 2000-01

270. Pushkin—Pushkin’s major poems and prose are accompanied by detailed examination of his cultural milieu. Emphasis is on essential changes in the understanding of literary concepts relevant to this period of Russian literature (poetic genres, the opposition between poetry and prose, Romanticism, etc.).

not given 2000-01

270C. Pushkin and the Moderns—Graduate seminar pairs a close analysis of Pushkin’s major poetic texts with a study of “the Pushkin function” in specific works of 20th-century Russian literature. Prerequisite: knowledge of Russian.

not given 2000-01

272. Osip Mandelstam and the Modernist Paradigm—Open to advanced undergraduates and graduate students. Mandelstam’s background in Russian Symbolism. His poetry, prose, critical writings, and reception in the context of contemporary letters, scholarship, and cultural and political history. Acmeism; Mandelstam and the function of poetry in modern Russian culture; poet as citizen and martyr; Mandelstam’s Acmeism as a cultural paradigm in Soviet civilization; Theoretical approaches to the phenomenon of Mandelstam; the uses of Mandelstam in recent Russian poetry (Timur Kibirov and others). Prerequisite: three years of Russian, or consent of the instructor.

4 units, Win (Freidin)

272B. Osip Mandelstam and the Modernist Paradigm—Guided research and bi-weekly meetings devoted to discussion of individual research projects. Prerequisite: 272 or equivalent.

2 units, Spr (Freidin)

278. Tolstoy—Open to exempt undergraduates. Tolstoy’s creative evolution from his early and late short fiction (Childhood, The Sevastopol Tales, The Kreutzer Sonata, etc.) and notification (Confession and Anna Karenina), together with the appropriate critical texts. Readings in Russian.

not given 2000-01

292. Graduate Workshop in Design and Method of Research Projects in Literary and Cultural Studies—Weekly meeting with graduate students working in the area of Russian literature and culture to discuss their nascent and ongoing dissertation projects (A.M. and Ph.D.).

not given 2000-01

299. Individual Work—For graduate students in Slavic working on theses or engaged in special work. Prerequisite: written consent of instructor.

1-12 units, any quarter (Staff)

305. Russian Critical Traditions—The Russian intelligentsia invested its literature with the highest esthetic and ethical value, then developed a set of critical apparatuses that have inspired Western approaches to text. Readings in theorists from the early 19th to the late 20th century and from the most positivist to the entirely formalist. Possible topics: 19th-century radicals (Belinsky and Dobrolyubov), Futurist manifestoes, the Formalists, Freudian and Marxist models, Bakhtin, and the Tartu semioticians. Readings in English; some familiarity with the Russian canon is presumed.

not given 2000-01

399A,B,C. Advanced Research Seminar in Russian Literature—Offered as follow-up to 200- or 300-series seminars, as needed.

2-4 units, Aut, Win, Spr (Staff)

OVERSEAS STUDIES

These courses are approved for the Slavic Languages and Literatures major and taught at the campus indicated. Students should discuss with their major advisers which courses would best meet educational needs. Course descriptions can be found in the “Overseas Studies” section of this bulletin or in the Overseas Studies Program office, 126 Sweet Hall.

MOSCOW

10M. Intensive First-Year Russian
10 units, Aut (Staff)

51M. Second-Year Russian I
6 units, Aut (Kuznetsova)

52M. Second-Year Russian II
6 units, Win (Kuznetsova)

111M. Third-Year Russian I
6 units, Aut (Boldyreva)

112M. Third-Year Russian II
6 units, Win (Boldyreva)

177M. Fourth-Year Russian I
6 units, Aut (Shimanskaya)

178M. Fourth-Year Russian II
6 units, Win (Shimanskaya)

SOCIOLoGY


Chair: Andrew Walder
Professors: Karen Cook, Mark Granovetter, Michael T. Hannan (on leave), Douglas McAdam, John W. Meyer, Susan Olzak (on leave), Cecilia Ridgeway, C. Matthew Snipp, Nancy B. Tuma, Andrew Walder
Assistant Professors: Elisa Bienvenistock, Robert Freeland, Noah Mark, Michael Rosenfeld

CourtesY Professors: Larry Diamond, Joanne Martin, Joel Podolny, Walter Powell, Francisco Ramirez, Neil Smelser

CourseY Associate Professor: Clifford J. Nass

CourseY Assistant Professor: Ezra Zuckerman

Lecturers: Andrew Creighton, Michel Ferrary, Kathy Kuipers

Consulting Professor: George Bohmstedt

Consulting Associate Professor: Ruth Cronkite

Sociology is concerned with the full spectrum of social behavior (of individuals, small groups, large organizations, communities, institutions, and societies) and provides a strong intellectual background for students considering careers in the professions or business. Students may pursue degrees in sociology at the bachelor’s, master’s (coterminal), or doctoral levels.

UNDERGRADUATE PROGRAMS

Sociology offers two programs leading to the A.B. degree: the general sociology major and the specialized major. Both are designed around a core curriculum, the intent of which is to ensure adequate coverage of basic sociological knowledge and to provide enough flexibility for tailoring the degree program to fit individual needs and interests. The general major consists of the core curriculum plus a selection of additional courses intended to provide breadth of exposure to the variety of areas encompassed by sociology. The specialized major consists of the core
CORE CURRICULUM AND GENERAL SOCIOLOGY MAJOR

All recipients of the A.B. degree in Sociology must complete a minimum of 60 units of course work in the major. All courses taken to satisfy this 60-unit requirement must be taken for a grade of "C-" or better (except for Sociology 190-193). Related course work from other departments may fulfill part of this requirement, but such work must be approved in advance by a department adviser and must not exceed 15 units. All degree candidates must fulfill the following core requirements:

1. Introduction to Sociology (1). It is recommended that students take it early in their program. It is also suggested for students who are considering a major in Sociology.
2. Methods for Sociological Research (180), or its equivalent.
3. An introductory course in statistics, such as Sociology 181B, Statistics 60, Psychology 60, or equivalent.
4. Classics of Modern Social Theory (170), or an equivalent course in social theory.
5. At least three foundation courses, each from a different area of concentration.
6. Senior Seminar: Honors (200H) or Senior Seminar for Majors (200), to be taken by majors during their senior year.

To complete the general Sociology major, the student must complete 20 additional units of work.

SPECIALIZED SOCIOLOGY MAJOR

The department recognizes that some students may wish to engage in more in-depth study than that provided by the major in general Sociology. The specialized Sociology major permits students to pursue a more focused program in one of the four areas of concentration described below. To complete the requirements for the A.B. degree in Sociology with a field designation in Social Psychology and Interpersonal Processes, Organizations, Business, and the Economy; Political Sociology; or Social Stratification and Inequality, the student must (1) complete all the core and foundation curriculum, and (2) complete 20 units of course work in the selected area of concentration.

CONCENTRATION AREAS

Each area identifies a specialized area of inquiry, a set of skills within sociology, and basic preparation for a variety of careers. A brief description of each area follows.

Social Psychology and Interpersonal Processes—This area of inquiry focuses on the social organization of individual identity, beliefs, and behavior; and upon social structures and processes which emerge in and define interpersonal interactions. Processes studied include social acceptance and competition for prestige and status, the generation of power differences, the development of intimacy bonds, the formation of expectation states which govern performance in task oriented groups, and social pressures to constrain deviance. Foundation courses emphasize the effect of social processes on individual behavior and the analysis of group processes. This area provides excellent training for careers having a significant interpersonal component, including advertising and marketing, business, education, law, management, medicine and health, or social work.

Organizations, Business, and the Economy—This area studies the varied arrangements societies construct to pursue the diverse goals of their members, including the provision of material goods or services. Many such wants and goals are met by formal organizations. When these organizations provide goods or services for profit and sell them through a market, we call the activity "business," and the economic system "capitalism." Many goals are met through not-for-profit organizations, such as garden clubs, hospitals, prisons, and the Red Cross. Some private and social needs are met outside of organizations, such as health care provided by family members and exchange of favors among friends. Courses stress the factors that determine whether needs that people define are met through markets or by non-market allocation, through organizations or by other means. They also investigate the environmental and technical factors that shape organization structure, the determinants of how efficiently organizations operate, and the interpersonal processes that shape individual behavior within organizations. Careers related to this area include management and administration in business or public settings, management consulting and analysis, and legal studies related to corporations, organizations, and business.

Social Stratification and Inequality—This area offers a comprehensive overview of various forms of social inequality. It examines the shape and nature of social inequalities; the competition for power; the allocation of privilege; the production and reproduction of social cleavages; and the consequences of class, race, and gender for such outcomes as attitudes, political behavior, and lifestyles. Many courses emphasize changes in the structure of social inequalities over time, and the processes which produce similarities or differences in stratification across nations. Topics include educational inequality, employment history, gender differences, income distributions, poverty, race and ethnic relations, social mobility, and status attainment. Careers related to this field include administration, advertising, education, foreign service, journalism, industrial relations, law, management consulting, market research, public policy, and social service.

Political Sociology—This area concerns the emergence, reproduction, and change of political systems and institutions, especially focusing on why and how different political systems appear in different times and places, and how varied are the systems referred to with simple descriptions such as democracy or capitalism. Transitions among democracy and dictatorship or socialism and capitalism are related to historical patterns and to social structure and organization. The origins and significance for change of social movements, including nationalism and revolutions, are studied in comparative and historical perspective. Careers related to this area include law, government service, and national and international business applications.

CONCENTRATION AREA COURSES

Many of the department courses can be categorized as primarily oriented to one of the four areas of concentration; a few courses are relevant to more than one area. Within each area of concentration, one or more undergraduate foundation courses are identified which provide a general introduction to the area or some portion of it. Courses, classified by area, are as follows:

1. Social Psychology and Interpersonal Processes
   Foundation Courses: 120, 121
   Other Courses: 125-128, 132, 142, 150, 220-227, 242

2. Organizations, Business, and the Economy
   Foundation Courses: 114, 160
   Other Courses: 110, 115, 130, 161-169, 260-268

3. Social Stratification and Inequality
   Foundation Course: 140
   Other Courses: 132, 134, 139, 142-149, 150, 240-249

4. Political Sociology
   Foundation Courses: 110, 130
   Other Courses: 112-118, 131, 136, 133, 138, 210-218, 230, 231, 236

MINORS

The minor in Sociology is intended to familiarize students with the basic concepts and methods of the discipline. In addition to ensuring considerable breadth of exposure to the fundamental issues and approaches of the field of sociology, students are encouraged to obtain some depth of exposure to one of the specialized areas of study.
The requirements for a minor in sociology are as follows:

**Course No. and Subject** | **Units**
---|---
Sociology 1: Introduction to Sociology | 5
Sociology 180: Methods for Sociological Research | 5
Two Foundation Courses, one each from two of the four concentration areas (e.g., Social Psychology; Organizations, Business and the Economy; Stratification; Political Sociology) | 10
Additional course work in the department, preferably in the areas of concentration associated with the Foundation Course taken (consult listing of courses for each area described elsewhere in the Stanford Bulletin) | 15
Total course work required | 35

All courses qualifying for the minor must be taken for a letter grade and receive a grade point average (GPA) of 'C-' or higher.

**HONORS PROGRAM**

Students desiring to undertake an independent scholarly project under the direction of a faculty member are encouraged to apply for admission to the department’s honors program. To enter the program, the student must be accepted by a faculty member of the department who agrees to advise on the research and writing of the essay. It is possible in some cases for students to work with faculty advisers in other departments, but such arrangements must be approved by the chair of the Undergraduate Studies Committee. Admission to the program requires a grade point average (GPA) of 'B+' or higher in courses taken within the major, and an overall GPA of 'B' or higher in all undergraduate course work.

Work on the project can begin earlier, but ordinarily is initiated in connection with meeting the course requirements of Sociology 200H, Honors Senior Seminar. Students are encouraged to begin designing their honors project in connection with this seminar, in consultation with the seminar leader and a faculty member who is willing to serve as sponsor for the honor’s project. If admitted to the program, the work can then be completed during Winter and Spring quarters.

To formally enter the program, a student must complete an application form from the department office. The form requires the endorsement of the faculty sponsor and is to be accompanied by a brief description of the project to be undertaken and a copy of the student’s undergraduate transcript. Prospective candidates must submit the copy of the completed application to the chair of the Undergraduate Studies Committee no later than the end of the third quarter before graduation (typically Autumn Quarter of the senior year).

Honors students may earn up to 12 units credit for work leading to completion of the required honors thesis (excluding units associated with the Senior Seminar). To be eligible for an honors degree, a grade of 'A-' or better must be earned on the honors thesis. If an 'A-' is not earned, the thesis credit counts toward meeting the standard major requirements.

Successful completion of honors in Sociology requires (1) completion of all requirements for the major; and (2) completion of a thesis of honor’s quality (a grade of 'A-' or higher). The thesis is due on or before the beginning of the End-Quarter period in the student’s final quarter before graduating. If the thesis has been sponsored by a faculty member outside the department, it must be submitted to both that sponsor and to the chair of the Undergraduate Studies Committee, who appoints a departmental reader to evaluate the paper. Both the sponsor and the reader must agree that the paper merits honors. In every case, two copies of the final paper must be submitted. One is retained by the department and becomes a part of the department’s permanent collection.

**COTERMINAL MASTER’S PROGRAM**

Stanford undergraduate students who wish additional training in sociology (whatever their undergraduate major), and who have a good academic record (ordinarily a GPA of at least ‘B’ in their previous undergraduate work), may apply to the coterminal master’s program as described in the “Undergraduate Degrees” section of this bulletin.

To apply for admission to the coterminal program, students should submit with the coterminal application the following: (1) a statement of purpose providing the rationale for the proposed program of study, (2) a proposed program that specifies at least 45 units of course work relevant to the degree program and at least 36 units in Sociology, (3) a current undergraduate transcript, and (4) two letters of recommendation from Stanford faculty familiar with the student’s academic work.

All 45 course units to be counted toward the graduate degree must be at or above the 100 level; at least 18 course units must be above the 200 level. Because the acquisition of research skills is an important component of graduate training in the social sciences, it is recommended that coterminal students take one or more research methodology courses, for example, Sociology 281A and 281B. A grade of ‘B’ or better must be secured in each course satisfying the 45-unit requirement.

Most coterminal students propose programs that concentrate on one of the four areas of concentration offered by the department: Social Psychology and Interpersonal Relations; Organizations, Business, and the Economy; Political Sociology; or Social Stratification and Inequality. This approach helps to ensure program coherence.

**GRADUATE PROGRAMS**

University requirements for the A.M. and Ph.D. degree are described in the “Graduate Degrees” section of the bulletin.

**Admission**—Applicants to the doctoral program should have some undergraduate preparation in sociology; however, the department does consider for admission those without such preparation. Each applicant must submit results from the general Graduate Record Examination. The GRE Advanced Tests in Sociology is not required. In addition, foreign students must take the TOEFL exam (a minimum score of 600 is required by the University to be considered for admission). Submission of a writing sample (a social sciences paper is preferred) and three letters of recommendation are also required. Admission forms can be obtained from Graduate Admissions, Registrar’s Office (http://www.stanford.edu/dept/Registrar/admissions/applyinfo.html). Completed forms and supplemental materials should be returned to the Department of Sociology. Students are admitted once each year for graduate study beginning in Autumn Quarter. The department deadline for receiving applications for admission is January 5, 2001.

**MASTER OF ARTS**

The department does not admit students who are candidates solely for the A.M. in Sociology. This degree is, however, granted as a step toward the fulfillment of Ph.D. requirements. To receive the A.M., 45 units of approved work must be completed with a grade point average (GPA) of ‘B’ or better. All course work must be at 100 level or above; 18 units must be above the 200 level.

Students enrolled in business, education, law, medicine, or any other advanced degree program at Stanford may wish to obtain a master’s degree in Sociology. In this instance, the usual admission requirements are waived, but course requirements are determined in consultation with the Sociology adviser for doctoral candidates from other departments and schools. All 45 units must be taken in Sociology courses at Stanford. Interested students should contact the department for advance approval of their programs.

**DOCTOR OF PHILOSOPHY**

The department admits only those students who appear to have the aptitude and qualities to complete the Ph.D. program in the Department of Sociology successfully. The curriculum and degree requirements are designed to provide students with the necessary knowledge and skills to become proficient as both scholars and teachers. The courses and requirements also provide faculty with essential information on the progress of each student and on areas of difficulty or deficiency requiring attention and improvement.

Students must complete the following department requirements for the Ph.D. degree in Sociology:

1. In order to receive a thorough introduction and orientation to the field of sociology, the department, and the faculty, each student must enroll in the Graduate Proseminar. The proseminar is a one-quarter course given during the Autumn Quarter of the first year of residence. One unit of credit is given for this course; grading is on a satisfactory/no credit basis. The proseminar leader also serves as the academic
adviser for all first-year students. After the first year, students are allowed to select their academic adviser from among members of the department’s faculty.

2. As partial preparation for becoming an accomplished researcher, each student must complete three quarters of research experience, working under the supervision of faculty members. The experience may involve paid work as a Research Assistant (RA), or unpaid work as a research apprentice, carried out to obtain research experience. Students may work with only one, or more than one, faculty member to satisfy the requirement. With the approval of the chair of Graduate Studies, research experience may be acquired by involvement in research projects outside the department, for example, the American Institute for Research or the Veteran’s Administration Hospital. It is recommended that students complete their research requirements early in their graduate program; the requirement must be completed by the end of the fourth year of residency.

3. As partial preparation for becoming an accomplished teacher, each student must complete three quarters of teaching apprenticeship in departmental courses, serving as a Teaching Assistant (TA) working under the supervision of a faculty member, or as a Teaching Fellow (TF). All students are required to take a one-quarter TA training course offered by the department during their first year. In addition, students are expected to take advantage of the department’s and University’s teacher training programs during their first few years of residence. Students for whom English is a second language are expected to acquire sufficient facility in English to be an effective teacher.

4. In order to demonstrate command of a range of sociological literatures, students must take four broad survey courses offered by department faculty in the following areas: Organizations, Business, and the Economy; Political Sociology; Social Psychology and Interpersonal Processes; Social Stratification and Inequality. Students should consult with their adviser to ensure that the combination of courses selected to meet this requirement exhibits sufficient breadth. This requirement must be met by the end of the third year of residency.

5. In order to obtain a thorough grounding in sociological theory, each student must take two courses in theory (Sociology 370A or 370B or equivalent), and a course on the development of theory and research design (Sociology 372 or equivalent).

6. In order to obtain a thorough grounding in research methods, each student must complete four courses in methodology (281A, 382, 383, and 384). Students with little background in statistics are encouraged to take Sociology 281B or equivalent.

7. In partial preparation for a career of writing scholarly papers, each student must complete a paper by May 15 of the second year of residency. This second-year paper may be on any sociological topic, and may address theoretical, empirical, or methodological issues. The paper is expected to reflect original work and is considered an important piece of evidence in the decision to advance to candidacy. A two-person committee that includes the primary adviser evaluates the paper. Although the reading committee is usually comprised of two regular faculty members in the department, emeritus and other faculty outside of the department may serve as a committee member with prior approval.

8. In order to demonstrate the ability to conduct independent scholarly work, each student must prepare a dissertation prospectus and pass the University oral examination. The oral exam is intended to evaluate the dissertation prospectus or a partial draft of the dissertation and to assess the student’s knowledge of the relevant theory and research in the area in which the project intends to contribute.

9. Each student must complete a doctoral dissertation. Assessment of satisfactory completion is determined by the student’s doctoral committee members. All students are invited to present their dissertation findings at an informal department colloquium.

The faculties assume the responsibility to provide students with timely and constructive feedback on their progress toward a degree. In order to evaluate student progress and to identify potential problem areas, the department’s faculty reviews the academic progress of each first-year student at the beginning of Winter and Spring quarters and again at the end of Spring Quarter. The reviews at the beginning of Winter and Spring quarters are primarily intended to identify developing problems that could impede progress. In most cases, students are simply given constructive feedback, but if more serious concerns warrant, a student may be placed on probation with specific guidelines for addressing the problems detected. The review at the end of Spring Quarter is more thorough: Each student’s performance during the first year is reviewed and discussed. Possible outcomes of the spring review include: (1) continuation of the student in good standing, or (2) placing the student on probation, with specific guidelines for the period of probation and the steps to be taken in order to return to good standing. For students on probation at this point (or at any other subsequent points), possible outcomes of a review include: (1) restoration to good standing; (2) continued probation, again with guidelines for necessary remedial steps; or (3) termination from the program. Students leaving the program at the end of the first year are usually allowed to complete the requirements to receive an A.M. degree, if this does not involve additional residence or financial support. All students are given feedback from their advisers at the end of their first year of graduate work, helping them to identify areas of strengths and potential weakness.

At the end of the sixth quarter of residency, the faculty again review the progress of all doctoral students in the program. Students who are performing well, as indicated by their course work, teaching and research apprenticeship performance, and second-year paper, are advanced to candidacy. This step implies that the student has demonstrated the relevant qualities required for successful completion of the Ph.D. Future evaluations are based on the satisfactory completion of specific remaining department and University requirements. Students who are still on probation at this stage may be (1) advanced to candidacy; (2) retained on probation with specification of the steps still required to be removed from this status; or (3) terminated from the program.

REQUIREMENTS

SURVEY COURSES
314. Economic Sociology or 360. Foundations of Organizational Sociology
310. Political Sociology or 318. Social Movements and Collective Action
340. Social Stratification

RESEARCH METHODS
281A. Sociological Methodology 1A: Computer-Assisted Data Analysis
281B. Sociological Methodology 1B: Statistics (required only of students with little statistics background)
382. Sociological Methodology II: The General Linear Model
383. Sociological Methodology III: Advanced Models for Discrete Outcomes
384. Sociological Methodology IV: Advanced Models for Continuous Outcomes

THEORY
370A. Sociological Theory: Social Structure, Inequality, and Conflict or 370B. Sociological Theory: Social Interaction and Group Processes
372. Theoretical Analysis and Design

Students must complete additional course work sufficient to prepare them to write their second-year paper.

Ph.D. MINOR

Sociology offers a minor for School of Education doctoral students. Students must complete a minimum of 30 graduate-level units with a grade point average (GPA) of ‘B-’ or better. All 30 units for the minor are to be taken in Sociology courses or in courses taught by Sociology faculty, the exception being statistics or methods courses. Research and directed reading courses are acceptable, but must be approved in advance by the chair of the Graduate Studies Committee. The specific program must be approved by a Sociology adviser and filed with the Department of Sociology.

JOINT PROGRAM WITH THE SCHOOL OF LAW

The faculties of the School of Law and the Department of Sociology conduct joint programs leading to either a combined J.D. or J.M. degree
with an A.M. degree in Sociology or to a combined J.D. or J.M. degree
with a Ph.D. in Sociology.

Normally, the student interested in pursuing an A.M. degree in Sociology completes one full year of the law program, applying for admission to the Department of Sociology during the first year of law school. If admitted, the student must complete regular Department of Sociology master’s degree requirements. Applications for a joint program must be approved by the Research and Interdisciplinary Studies Committee of the School of Law and by the Department of Sociology. Faculty advisers from both the department and the school participate in the planning and supervise the study program of students admitted to joint degree status.

The joint J.D.-Ph.D. degree program is designed for students who wish to prepare themselves for research or teaching careers in areas relating to legal and sociological concerns. Participation requires application to both the School of Law and the Department of Sociology and acceptance by each. Upon admission, students may elect to begin their study program in either the School of Law or the Department of Sociology. Normally, the student spends the first full year in one program and the second full year in the other. Thereafter, the student may take courses concurrently until requirements for both degree programs have been met.

COURSES

Courses are open to all students without prerequisites, unless specifically indicated. Courses numbered 200-299 are open to advanced undergraduate and graduate students. Courses numbered 300 and above are normally offered to doctoral students only. Courses with an ‘X’ suffix are taught at an overseas campus only.

OPEN TO ALL STUDENTS

INTRODUCTORY

1. Introduction to Sociology—Introduces the central concepts, methods, and theoretical orientations of the discipline. Sociological imagination is illustrated by recent theory and research. Possible topics: the persistence of class cleavages; ethnic, racial, and gender inequalities; religious beliefs and the process of secularization; functions and dysfunctions of educational institutions; criminology and social deviance; social movements and social protest; production and reproduction of culture; rise of organizational society. GER:3B (DR:9)

5 units, Win (Snipp)
Spr (McAdam)

10. The Nature of Health—(Enroll in Human Biology 12.)

3 units, Spr (Barr)

25N. Stanford Introductory Seminar: Understanding the Sixties—Preference to freshmen. A grounded sociological explanation for the political and cultural turbulence that marked the 1960s and its ambiguous contemporary legacy. Enrollment limited to 16.

3-5 units, Win (McAdam)

27N. Stanford Introductory Seminar: Cultural Patterns in Contemporary Society—Preference to freshmen. Introduces the point of view that culture is "the" crucial factor to understanding contemporary "human" society; how humans’ nearly unique capacity for cultural transmission has produced the most fundamental characteristics of contemporary human society. How is life in the information age different from the lives of people who lived in the past? How different types of cultural transmission produce different types of cultural objects, e.g., urban legends. Enrollment limited to 16.

3 units, Aut (Mark)

46N. Stanford Introductory Seminar: Race and Ethnic Identities—Preference to freshmen. Introduction to how new identities get created and legitimated. What does it mean to try on a different identity, i.e. to "pass"? National groups and ethnic groups are so large that one individual can only possibly know an infinitesimal fraction of the other members of the group. What explains the seeming coherence of the groups? If identities are a product of the imagination, why are people willing to fight and die for them? Enrollment limited to 16.

3 units, Win (Rosenfeld)

POLITICAL SOCIOLOGY

110. Politics and Society—(Graduate students register for 210.) Themes of political sociology, the origins and expansion of the modern state, linkages between state and society, the impact of the modern world system on national policies, the internal distribution of power and authority, and the structure of political group formation and individual participation in modern states. Emphasis is on modern empirical literature. GER:3B (DR:9)

5 units, given 2001-02

112. Comparative Democratic Development—(Enroll in Political Science 116L.)

5 units (Diamond) given 2001-02

113. Institutional Theories of Nation-States and Other Organizations—(Graduate students register for 213.) Reviews the institutional theories and research on the impact of wider environments (including world society as a whole) on nation-state structures, and on organization forms arising within national societies. Prerequisite: previous work in comparative or political sociology.

5 units, Spr (Meyer)

116. Comparative Sociology: Successor States of Soviet Union

5 units, given 2001-02

117A. China under Mao—(Graduate students register for 217A.) The transformation of Chinese society from the 1949 revolution to the eve of China’s reforms in 1978: the creation of a socialist economy, the reorganization of rural society and urban workplaces, the emergence of new inequalities of power and opportunity, and the new forms of social conflict during Mao’s Cultural Revolution of 1966-69 and its aftermath. GER:4a (DR:2)

5 units, Aut (Walder)

118. Social Movements and Collective Action—(Graduate students register for 218.) Contemporary research on social movements and collective action. The strategies used by researchers for collecting and analyzing information on collective events, protests, conflicts, and social movements organizations. Analysis of different theories and methods that try to account for the rise and fall of social movement activity over time. GER:3b (DR:9)

5 units, given 2001-02

130. Education and Society—(Graduate students register for 230; same as Education 220C.) The effects of schools and schooling on individuals, the stratification system, and society. Education as socializing individuals and as legitimizing social institutions. The social and individual factors affecting the expansion of schooling, individual educational attainment, and the organizational structure of schooling. GER:3b (DR:9)

5 units, Win (Meyer)

131. World, Societal, and Educational Change: Comparative Perspectives—(Graduate students register for 231; same as Education 136.) Analysis of the relations between educational and societal developments from a comparative perspective. Readings on various theoretical perspectives and empirical studies on the structural and cultural sources of educational expansion and differentiation, and on the cultural and structural consequences of educational institutionalization. Research topics: education and nation-building; education, mobility, and equality; education, international organizations, and world culture.

4-5 units (Ramirez) not given 2000-01

133. Computers and Interfaces: Psychological and Social Issues—(Graduate students see 233; enroll in Communication 169.)

5 units, Win (Nass)
136. Law and Society—(Graduate students register for 236.) Sociological approaches to the study of law and the legal system; lectures on theoretical perspectives with examples from legal settings. Topics: central philosophical debates in the sociology of law; the social-psycho-theoretical foundations of legal behavior; relations between law and the economy, stratification, culture, ideology, and social change. Contemporary legal issues (crime, litigiousness, civil rights, etc.) provide opportunities to link sociological theories with current events. Prerequisite: 1. 5 units, Spr (Creighton)

138. American Indians in Comparative-Historical Perspective—(Graduate students register for 238.) Comparative historical framework surveys the demographic, political, and economic processes and events that shaped relations between Euro-Americans and American Indians from 1600 to 1890. How the intersection of these processes affected the outcome of conflicts between these two groups, and how this conflict was decisive in determining the social position of American Indians in the late 19th century and the evolution of the doctrine of tribal sovereignty. GER:4b (DR:3) 5 units, Win (Cook)

SOCIAL PSYCHOLOGY AND INTERPERSONAL PROCESSES

105. Status, Friendship, and Social Pressure: An Experiential Approach—(Graduate students register for 205.) The basic social processes that structure the individual’s experience in interpersonal situations, including group pressure on individual choices, social control of deviations, operation of status distinctions (sex and race), and formation of friendships and intimate (love) relationships. Structured exercises and simulation gaming in section meetings provide experience with these processes. Lectures examine the processes in terms of theoretical ideas, empirical research, and clinical strategy. 5 units, Aut (Staff)

120. Interpersonal Relations—(Graduate students register for 220.) Forming ties, developing norms, status, conformity, deviance, social exchange, power, and coalition formation; important traditions of research have developed from the basic theories of these processes. Emphasis is on understanding basic theories and drawing out their implications for change in a broad range of situations, families, work groups, and friendship groups. GER:3b (DR:9) 5 units, Aut (Ridgeway)

121. Social Psychology and Social Structure—(Graduate students register for 221.) Understanding the individual’s relationship to social groups, from two-person groups to society at large. Emphasis is on how social structure shapes individuals and how individuals in turn affect their social environment. Topics: identity, agency, interpersonal relations, social dilemmas, the life course, and collective behavior. GER:3b (DR:9) 5 units, Aut (Bienenstock)

125. Sociology of Religion—(Graduate students register for 225.) The social patterns of religious belief and practice, and the classical and contemporary theoretical approaches to understanding these patterns. Topics: churches, sects and cults, sources of religious pluralism, relationships between religion and aspects of social structures including the economy, class structure, ethnicity, social networks, and the state. 5 units, Spr (Mark)

126. Introduction to Social Networks—(Graduate students register for 226.) Introduction to social network theory, methods, and research. Basic network concepts (e.g., density, homogeneity, and centrality) are defined and applied to a variety of substantive areas. The impact of social network structure on individuals and groups in such areas as communities and neighborhoods, families, work life, and innovations. 5 units, Win (Mark)

127. Bargaining, Power, and Influence in Social Interaction—(Graduate students register for 227.) Lab/discussion. Introduction to research and theoretical work on bargaining, social influence, and issues of power and justice in various social settings, including teams, work groups, and organizations. The basic theoretical approaches to the study of the exercise of power and influence in social groups and related issues in the study of social interaction, e.g., the promotion of cooperation, the effects of competition and conflict, negotiation, and inter-group relations. Enrollment limited to 40. 5 units, Win (Cook)

150. The Family—Examines American families, employing theories of social psychology to study the interactions within the family and between the family and other institutions. Topics: the nature and history of the family, state regulation of families, variations by class and ethnicity, family violence, gender roles, parenting, and divorce. 5 units, Spr (Kuipers)

SOCIAL STRATIFICATION AND INEQUALITY

132. Gender and Education—(Enroll in Education 170.) 4 units, Aut (Christopher)

134. Education and the Status of Women: Comparative Perspective—(Enroll in Education 197.) GER:4c (DR:7) 4-5 units, Win (Woitka)

139. American Indians in Contemporary Society—(Graduate students register for 239.) The social position of American Indians in contemporary American society, 1890 to the present. The demographic resurgence of American Indians, changes in social and economic status, ethnic identification and political mobilization, and institutions, e.g., tribal governments and the Bureau of Indian Affairs. Recommended: 138 or a course in American history. GER:4b (DR:3) 5 units, Spr (Snipp)

140. Introduction to Social Stratification—(Graduate students register for 240.) Survey and assessment of the main classical and modern explanations of the causes of social, economic, and political inequality. Key issues: the consequences of inequality for individuals and groups; the relative importance of economic, political, and social forces in creating and sustaining inequality; class consciousness; the significance of race, ethnicity, and gender; and the use of social policy to mitigate inequality. Cases discussed range from technologically simple tribes, the Indian caste system, and the U.S. in modern times, including problems of poverty and the "underclass." GER:3b (DR:9) 5 units, Win (Granovetter)

142. Sociology of Gender—(Graduate students register for 242C.) Gender inequality in contemporary American society with different explanations for how it is maintained. The social and relative nature of knowledge and the problems this poses for understanding sex differences and gendered behavior in society. Three analytical levels of explanation for gender inequalities: socialization, interaction processes, and socio-economic processes. Arguments and evidence for each approach. The social consequences of gender inequality, e.g., the feminization of poverty and problems of interpersonal relations. GER:4c (DR:7) 5 units, Win (Kuipers)

145. Race and Ethnic Relations—(Graduate students register for 245.) Race and ethnic relations in the U.S. and elsewhere. Analysis of the processes that render ethnic and racial boundary markers (e.g., skin color, language, culture) salient in interaction situations. Explanations of why only some groups become targets of ethnic attacks. Analysis of the social dynamics of ethnic hostility and ethnic/racial protest movements. GER:3b,4b (DR:3 or 9) 5 units, given 2001-02

147A. Examining Urban Poverty—How modern theorists explain the emergence of urban poverty and the consequences thereof. Classical theory and modern poverty theorists. The outcomes of poverty: social
dislocations; gangs, drugs, and urban family structure; the interplay of poverty and politics in the U.S.
5 units, Win (Staff)

149. The Urban Underclass—(Graduate students register for 249.) Recent research and theory on the urban underclass, including evidence on the concentration of African Americans in urban ghettos, and the debate surrounding the causes of poverty in urban settings. Analysis of ethnic/racial conflict, residential segregation, and changes in the family structure of the urban poor. GER:3b (DR:9)
5 units, Win (Rosenfeld)

151A. Asians in America: Trends and Issues—Introduction to selected topics and issues facing contemporary Asian American communities, including debunking the model minority stereotype, economic sociology of Asian Americans, and panethnic identity and political empowerment.
5 units, given 2001-02

ORGANIZATIONS, BUSINESS, AND THE ECONOMY

114. Economic Sociology—(Graduate students register for 214.) The sociological approach to production, distribution, consumption, and markets, emphasizing the impact of norms, power, social structure, and institutions on the economy. Comparison of classic and contemporary approaches to the economy among the social science disciplines. Topics: consumption, labor markets, organization of professions such as law and medicine, the economic role of informal networks, industrial organizations (including the structure and history of the computer and popular music industries), business alliances, capitalism in non-Western societies, and the transition from state socialism in Eastern Europe and China. GER:3b (DR:9)
5 units, Aut (Granovetter)

115. Topics in Economic Sociology—(Graduate students register for 215.) Intensive reading/discussion of topics initially explored in 114/214, with emphasis on countries and cultures outside N. America. Possible topics: families and ethnic groups in the economy, corporate governance and control, corporate strategy, relations among firms in industrial districts and business groups, the impact of national institutions and cultures on economic outcomes, transitions from state socialism and the role of the state in economic development. Possible case studies: the U.S., Germany, Italy, Britain, France, Brazil, Korea, India, Japan, and China. Prerequisite: 114 or 214.
5 units, given 2001-02

5 units, Aut (Freeland)

161. Organizational Ecology—(Graduate students register for 261.) Recent research on populations of market and non-market organizations. The processes determining when new organizations emerge, what forms they assume, and how long they last. Relations between organizations and the environment, and the competitive, commensal, and symbiotic relations that tie organizations together.
5 units, given 2001-02

161A. Theory and Practice of Formal Organizations—(Graduate students register for 261A.) Within the framework of organizational theories, how organizations seek to adapt to their environments in consideration of the following issues: What are the mechanisms used by organizations to find out the demands of society? How do organizations determine their goals? What are the mechanisms of organizational learning and change?
5 units, Spr (Staff)

162. Organizations: Then, Now, Next—(Graduate students register for 262A.) The sociology of organizations, emphasizing historical changes in social structures. Organizations have become important collective social actors during the last 150 years, and have undergone important changes. The development and spread of organizations, changes in them over time, and their causes.
5 units, Spr (Scott)

163. Work, Organization, and Society—(Graduate students register for 263A.) Introduction to the sociological study of work—its personal, economic, and cultural significance. The types and qualities of work; work's social and technical organization in projects, firms, unions, and professions; its regulation by the state, and its systemic role in segmenting and stratifying society.
5 units, given 2001-02

164. Firms, Markets, and States—(Graduate students register for 264.) The relationship between business organizations, state economic policies, and market competition. The ways in which state intervention and broad institutional factors influence and delimit the organization of firms. The ways in which such factors create different forms of market competition.
5 units, Win (Freeland)

166. Organizations and Public Policy—(Graduate students register for 266; same as Public Policy 102A.) Concepts and methods for analyzing the influence of organizations on the setting and implementation of public policy. Varying conceptions of organizations as corporate actors and as social contexts. The roles of organizations in relation to public policy; organizations as decision makers and problems solvers, as change agents, and as clients. Prerequisite: 160 or Management Science and Engineering 180.
5 units, given 2001-02

169. Health Care in America—(Enroll in Human Biology 160.)
3 units, Arr (Barr)

SOCIOLOGICAL THEORY

170. Classics of Modern Social Theory—The enduring contributions of Karl Marx, Max Weber, and Emile Durkheim to contemporary sociology. Topics: the problem of social order and the nature of social conflict; capitalism and bureaucracy; the relationship between social structure and politics; the social sources of religion and political ideology; and the evolution of modern societies. Examples from contemporary research illustrate the impact of these traditions.
5 units, Win (Freeland)

RESEARCH METHODS

180. Methods for Sociological Research—(Graduate students register for 280.) Introduces the methods used in contemporary sociological research, focusing on strategies for designing research and analyzing data.
5 units, Spr (Rosenfeld)

181A. Sociological Methods IA: Computer Assisted Data Analysis—(Graduate students register for 281A.) For Sociology majors only. Introduction to the computer as a research tool and to common data sets in the social sciences. Emphasis is on development of the necessary skills for other courses in sociology methodology. Enrollment limited to 15.
2 units, Aut (Staff)

181B. Sociological Methods IB: Statistics—(Graduate students register for 281B.) Emphasizes the statistical methods of principal relevance to sociology: contingency tables, correlation, and regression. Recommended: 181A/281A.
5 units, given 2001-02

200H. Senior Seminar: Honors—For Sociology majors accepted in the honors program. The student brings together theory, methods, and substantive courses by illustrating the ways in which sociological prob-
lems are framed, linked to theories, and answers pursued through appropriate research designs.

5 units, Aut (Cook)

200. Senior Seminar for Majors—Capstone course in which sociological problems are framed, linked to theories, and answers pursued through appropriate research designs. (WIM)
5 units, Aut (Bienenstock)

INDIVIDUALIZED LEARNING EXPERIENCES, PRIMARILY FOR UNDERGRADUATE MAJORS

190. Undergraduate Individual Study
1-5 units (Staff)

191. Undergraduate Directed Research—Work on a project of one’s own choice under the close supervision of a faculty member. Prior arrangement required.
1-5 units (Staff)

192. Undergraduate Research Apprenticeship—Work in an apprentice-like relationship with specific faculty member(s) on an on-going research project. Prior arrangement required.
1-5 units (Staff)

193. Undergraduate Teaching Apprenticeship
1-5 units (Staff)

196A,B,C. Honors Thesis—Work intensively on an honors thesis project under faculty supervision (see description of honors program). Must be arranged early in the year of graduation, or before.
1-15 units (Staff)

FOR ADVANCED/COTERMINAL UNDERGRADUATES AND MASTER’S STUDENTS

POLITICAL SOCIOLGY

210. Politics and Society—For graduate students; see 110.
5 units, given 2001-02

213. Institutional Theories of Nation-States and Other Organizations—For graduate students; see 113.
5 units, Spr (Meyer)

217. China’s Social Transformation—The implications of China’s transition to a market economy for social stratification and mobility, property rights and economic organization, and political organization and authority. Critical overview of recent scholarship, identifying promising questions for further research.
5 units (Walder) given 2001-02

217A. China under Mao—For graduate students; see 117A.
5 units, Aut (Walder)

217B. Seminar: Chinese Communist Revolution—Examines the evolving interpretations of the Chinese Communist Revolution of 1921-1955 against the background of the theoretical literature on the revolutionary process. How have the interpretations of the communist revolution changed over time? Why? What contributions to the theoretical literature on revolution can the Chinese case make, now that such an extensive empirical literature about it exists?
5 units (Walder) given 2001-02

218. Social Movements and Collective Action—For graduate students; see 118.
5 units, given 2001-02

230. Education and Society—For graduate students; see 130.
5 units, Win (Meyer)

231. World, Societal, and Educational Change: Comparative Perspectives—(Same as Education 306D.) For graduate students; see 131.
4-5 units, Aut (Ramirez)

4 units, Win (Nass)

236. Law and Society—For graduate students; see 136.
5 units, Spr (Creighton)

238. American Indians in Comparative-Historical Perspective—For graduate students; see 138.
5 units, Win (Snipp)

SOCIAL PSYCHOLOGY AND INTERPERSONAL PROCESSES

205. Status, Friendship, and Social Pressure: An Experiential Approach—For graduate students; see 105.
5 units, Aut (Staff)

220. Interpersonal Relations—For graduate students; see 120.
5 units, Aut (Ridgeway)

221. Social Psychology and Social Structure—For graduate students; see 121.
5 units, Aut (Bienenstock)

222. Sociology of Culture—The major theoretical approaches to culture, including cultural capital theory, rational choice, symbolic interactionism, and structuralism. The adequacy of explanations offered by different theories for major empirical findings in the sociology of culture. Emphasis is on the relationship between culture and social structure.
5 units, given 2001-02

224. Interaction Processes in Education—(Enroll in Education 312.)
4 units, Aut (McFarland)

225. Sociology of Religion—For graduate students; see 125.
5 units, Spr (Mark)

226. Introduction to Social Networks—For graduate students; see 126.
5 units, Win (Mark)

227. Bargaining, Power, and Influence in Social Interaction—For graduate students; see 127.
5 units, Win (Cook)

SOCIAL STRATIFICATION AND INEQUALITY

232. Problems in Sociology of Education—(Graduate students register for 330; enroll in Education 210.)
4 units, Spr (McFarland)

239. American Indians in Contemporary Society—For graduate students; see 139.
5 units, Spr (Snipp)

240. Introduction to Social Stratification—For graduate students; see 140.
5 units, Win (Granovetter)

242. Sociology of Gender—For graduate students; see 142.
5 units, Win (Kuipers)

245. Race and Ethnic Relations—For graduate students; see 145.
5 units, not given 2000-01

249. The Urban Underclass—For graduate students; see 149.
5 units, Win (Rosenfeld)
ORGANIZATIONS, BUSINESS, AND THE ECONOMY

214. Economic Sociology—For graduate students; see 114.
   5 units, Aut (Granovetter)

215. Topics in Economic Sociology—For graduate students; see 115.
   5 units, given 2001-02

260. Formal Organizations—For graduate students; see 160.
   5 units, Freeland

261. Organizational Ecology—For graduate students; see 161.
   5 units, given 2001-02

261A. Theory and Practice of Formal Organizations—For graduate students; see 161A.
   5 units, Spr (Staff)

261B. Women in Organizations—(Same as Business 387R.) Business cases, exercises, videos, class discussions, and guest speakers are used to explore issues relevant to women's working experiences in managerial and professional positions. Topics: cross cultural differences in women's experiences, women's networking patterns, fair pay and promotion issues, management styles, and strategies of women entrepreneurs.
   4 units, Spr (Martin)

262. Organization and Environment—(Same as Business 672R.) Seminar considers alternative theoretical approaches useful for analyzing organization-environment and inter-organizational relations. Approaches: resource dependence, population ecology of organizations, and Williamson's markets and hierarchies. Perspectives analyze mergers and vertical integration, joint ventures, interlocking directorates, and organizational forms and structures. Prerequisite: consent of instructor.
   5 units, Haunschild

262A. Organizations: Then, Now, Next—For graduate students; see 162.
   5 units, Spr (Scott)

263. Cultures in Organizations—(Same as Business 386R.) Use of case studies, individual and group papers, exercises, videos, guest speakers and a field project to decipher the meanings of various cultural manifestations, including stories, rituals, informal norms, and formal policies and practices. Cultures in organizations are viewed as sources of conflict, power, ambiguity, and value consensus.
   4 units, Win (Martin)

263A. Work Organization and Society—For graduate students; see 163.
   5 units, given 2001-02

264. Firms, Markets, and States—For graduate students; see 164.
   5 units, Win (Freeland)

266. Organization and Public Policy—For graduate students; see 166.
   5 units, given 2001-02

267. Institutional Analysis of Organizations—Reading and research on the nature, origins, and effects of the modern institutional system. Emphasis is on the effects of institutional systems on organizational structure.
   3-5 units, Win (Scott)

269A. French Organizational Theory—French scholars in sociology and socio-economy bring several original theoretical perspectives to the analysis of organizations. The French understanding of organizational issues like game of power, organizational change, culture, hierarchy.
   5 units, Aut (Staff)

RESEARCH METHODS

280. Methods for Sociological Research—For graduate students; see 180.
   5 units, Spr (Rosenfeld)

281A. Sociological Methods IA: Computer Assisted Data Analysis—For graduate students; see 181A.
   2 units, Aut (Staff)

281B. Sociological Methods IB: Statistics—For graduate students; see 181B.
   5 units, given 2001-02

PRIMARILY FOR DOCTORAL STUDENTS

300. Workshop: Teaching Development—For doctoral students in Sociology with little or no teaching experience. Students learn the fundamental principles essential for becoming an effective instructor, advisor, and mentor to undergraduates. Topics: ethics, course organization and syllabus development, issues related to test construction and grading, conflict resolution, common classroom problems, and University policies related to matters such as sexual harassment. Technologies and other topics related to making effective presentations, and campus resources that may be used to improve classroom performance. Roundtable discussions with faculty and advanced graduate students known for teaching excellence. Students may be asked to give a demonstration lecture subject to critique and discussion.
   2 units, Spr (Kuipers)

305. Graduate Proseminar—For first-year Sociology doctoral students only. Introduction and orientation to the field of Sociology.
   1 unit, Aut (Cook)

308. Social Demography: Theories, Methods, and Data—For graduate students and advanced undergraduates interested in the study of demography. Topics: models of fertility behavior, migration models, stable population theory, life table analysis, data sources, and measurement problems. How population behavior affects social processes, and how social processes influence population dynamics. Recommended: knowledgeable about sociological research methods, and have a basic understanding of regression analysis and log linear models.
   5 units, Spr (Snipp)

POLITICAL SOCIOLOGY

   5 units, Aut (Meyer)

311A,B,C. Workshop: Comparative Studies of Educational and Political Systems—(Same as Education 387A,B,C.) Analysis of quantitative and longitudinal data on national educational systems and political structures. Prerequisite: consent of instructor.
   311A. 2-5 units, Aut (Ramirez)
   311B. 2-5 units, Win (Meyer)
   311C. 2-5 units, Spr (Meyer)

312A,B,C. Workshop: Collective Action and Social Movements—Issues of research design, data gathering, measurement, and analysis of evidence on the occurrence of race and ethnic collective action. Prerequisite: consent of instructor.
   1-5 units, given 2001-02

313A,B,C. Workshop: Political Sociology in Comparative and Domestic Perspective—Focus is on presentations by workshop participants and guest speakers on their work in the field of political sociology;
general discussions of contemporary issues. Prerequisite: consent of instructor.
2-5 units, Aut, Win, Spr (McAdam)

318. Social Movements and Collective Action—Intensive survey of past and contemporary scholarship on social movements and collective action. Topics: causes of social movements; dynamics of movement development; the question of movement outcomes; the organizational dimensions/dynamics of collective action; and the causes and consequences of individual activism.
5 units, given 2001-02

SOCIAL PSYCHOLOGY AND INTERPERSONAL PROCESSES

320. Foundations of Social Psychology—Major theoretical perspectives in interpersonal processes and social psychology. The basic principles, assumptions, and substantive problems associated with each perspective; techniques of investigation and methodological issues. Perspectives: symbolic interaction, social structure and personality, cognitive, and group processes.
5 units, Win (Ridgeway)

321A,B,C. Workshop: Social Psychology—Current theories and research agendas, critical reviews of recent publications, presentations of ongoing research by faculty and students. Prerequisite: consent of instructor.
2-5 units, Aut, Win, Spr (Cook)

322. Social Interaction, Social Structure, and Social Exchange—Current theoretical perspectives and research on such topics as social cognition and social identity, group processes, bargaining and negotiation, social justice, social dilemmas and social exchange, and networks and collective action. Students gain a broad knowledge of the sociological perspective on social psychology and a deeper knowledge of the social exchange approach.
5 units (Cook) given 2001-02

326A,B,C. Workshop: Sociology of Culture—Current theoretical perspectives and research on such topics as social cognition and social identity, group processes, bargaining and negotiation, social justice, social dilemmas and social exchange, and networks and collective action. Students gain a broad knowledge of the sociological perspective on social psychology and a deeper knowledge of the social exchange approach.
5 units, Win (Ridgeway)

SOCIAL STRATIFICATION AND INEQUALITY

330. Problems in Sociology of Education—(Enroll in Education 310.) For graduate students; see 232.
4 units, Spr (McFarland)

340. Social Stratification—Survey of classical and contemporary approaches to understanding the unequal distribution of goods, status, and power. Introduction to modern analytic models of the effects of social contact, cultural capital, family background, and “luck” in producing inequality. The role of education in perpetuating or undermining stratification. The causes and consequences of inequality by race and gender. The structure of social classes, status groupings, and prestige hierarchies in a variety of societies. Labor markets and their role in inequality. The implications of inequality for individual lifestyles. The rise of the “new class,” the “underclass,” and other emerging forms of stratification.
Prerequisite: enrollment in a doctoral program or consent of the instructor.
5 units, Win (Granovetter)

341A,B,C. Workshop: Social Stratification—Stratification theory and research for advanced students. Current theories and research agendas, critical reviews of recent publications, presentations of ongoing research by faculty and students. Prerequisite: registration in a Ph.D. program or consent of instructor.
1-5 units, given 2001-02

ORGANIZATIONS, BUSINESS, AND THE ECONOMY

314. Economic Sociology—Survey of the classical and contemporary literature in economic sociology, covering the sociological approach to markets and the economy, and comparing it to that of other disciplines. Possible topics: consumption, labor, profession, industrial organization, and the varieties of capitalism; historical and comparative perspectives on market and non-market provision of goods and services, and on transitions among economic systems. The relative impact of culture, institutions, norms, social networks, technology, and material conditions. Prerequisite: enrollment in a doctoral program or consent of the instructor.
5 units (Granovetter) given 2001-02

315A,B,C. Workshop: Economic Sociology—Theory, methods, and research in the sociology of the economy. Possible activities: participation in ongoing research projects; instruction in new methods; and presentation of ongoing research by students, faculty, or visiting speakers. Prerequisite: enrollment in a doctoral program or consent of the instructor.
2-5 units, Aut, Win, Spr (Granovetter)

360. Foundations of Organizational Sociology—Core problems in the sociology of organizations, main theoretical perspectives, and research programs directed at evaluating these perspectives.
5 units, Aut (Freeland)

361. Seminar: Social Psychology of Organizations—(Same as Business 671R.) Selected curriculum issues in social psychology relevant to behavior in organizations. Prerequisite: consent of instructor.
4 units (Morris)

363. Social and Political Processes in Organizations—(Same as Business 676R.) Focus is on cognition, attitudes, and behavior in organizations, drawing on psychological and sociological research at the “meso” level of analysis. Topics vary each year, including organizational learning and decision making; power and conflict; emotions in organizations; mobility and stratification; gender inequality and discrimination; networks; organizational justice and legitimacy; cultural perspectives on organizations, etc. No auditors. Prerequisite: enrollment in a Ph.D. program.
4 unit, Win (Martin)

363A. Seminar on Organization Theory—(Same as Education 375A.) For doctoral-level students or equivalents. Provides a thorough grounding in the social science literature on organizations. Readings are organized historically, and introduce the major theoretical traditions and debates in organization theory.
5 units, Aut (Powell)

363B. Seminar on Organizations: Theory and Application—(Same as Education 375B.) Continuation of 363A. Surveys current research on organizational change, drawing on institutional, network, and evolutionary perspectives. Focus is on recent empirical studies that analyze organizational/institutional/political change.
5 units, Win (Powell)

364. Organizations as Governance Structures—Introduction to a body of work that treats organizations as governance structures that coordinate transactions between firms while creating and maintaining cooperation within firms. In-depth reading of economic accounts of the firm (transaction cost economics, agency theory, and related approaches)
and of competing explanations of governance that have emerged in the recent sociological literature.

5 units (Freeland) given 2001-02

366. Workshop on Organizational Ecology—Workshop for designing, collecting, and analysis of data on long term change in populations and communities of organizations. Prerequisite: 360, consent of the instructor.

5 units, given 2001-02

SOCIOLOGICAL THEORY

370A. Sociological Theory: Social Structure, Inequality, and Conflict—The traditions of structural analysis derived from the work of Marx, Weber, and related thinkers. Antecedent ideas in foundational works are traced through contemporary theory and research on political conflict, social stratification, formal organization, and the economy.

5 units, Win (Walder)

370B. Sociological Theory: Social Interaction and Group Processes—The analyses of social solidarity and group processes derived from such thinkers as Durkheim, Simmel, and Mead. Antecedent ideas in foundational works are traced through contemporary theory and research on small group processes, social networks, group identification, and related subjects.

5 units, given 2001-02

372. Theoretical Analysis and Design—Teaches skills in theoretical analysis and the logical elements of design, including the systematic analysis of the logical structure of arguments, the relationship of arguments to more encompassing theoretical or meta-theoretical assumptions, the derivation of logical implications from arguments, assessments of theoretically significant problems or gaps in knowledge, etc.

5 units, Spr (Zelditch)

RESEARCH METHODS

335. Graduate Seminar: Methods for Social Science Research in China—(Enroll in Political Science 315O.)

2 units, Win (Oi, Oksenberg, Walder)

382. Sociological Methodology II: The General Linear Model—The general linear model for discrete and continuous variables. Introduction to model selection, the principles of estimation, assessment of fit, and modeling diagnostics. Prerequisites: 281A, B, or equivalents.

4-6 units, Win (Tuma)


3-6 units, Aut (Tuma)

384. Sociological Methodology IV: Advanced Models for Continuous Outcomes—The rationale for estimation and interpretation of static and dynamic models of continuous variables. Topics: structural-equation models, latent-variable models, times-series models, and pooled cross-section and time-series models. Evaluation at first class meeting determines whether students have the appropriate background.

4-6 units, given 2001-02


5 units, given 2001-02

387. Seminar: Frontiers of Quantitative Sociological Research—Advanced topics in quantitative sociological research, especially recently-developed models and methods. Possible topics: robust regression methods, boot-strapping, local likelihood estimation, quantile regression, two-sided logit models, event count models, event sequence models, heterogeneous diffusion models, and models for change in social networks.

3-5 units, Win (Tuma)

388. Advanced Models for Analysis of Tabular Arrays—Analysis of categorical data with log-linear, log-multiplicative, latent class, latent trait, Markov, Rasch, and related models.

5 units, given 2001-02

GRADUATE INDIVIDUAL STUDY

390. Graduate Individual Study (Staff)

391. Graduate Directed Reading (Staff)

392. Research Apprenticeship (Staff)

393. Teaching Apprenticeship (Staff)

394. Thesis (Staff)

395A, B, C. Research Internship—Graduate students engage in internship work and integrate that work into their academic program. Students register in the quarter following internship work and complete a research report outlining their work activity, problems investigated, key results, and any follow-up projects they expect to perform. Meets requirements for Curricular Practical Training for students on F-1 visas. Work completed cannot be counted toward the departmental research assistantship requirement.

(Staff)

OVERSEAS STUDIES

These courses are approved for the Sociology major and taught at the campus indicated. Students should discuss with their major advisers which courses would best meet educational needs. Course descriptions can be found in the "Overseas Studies" section of this bulletin or in the Overseas Studies Program office, 126 Sweet Hall.

BERLIN

145. Multiculturalism in Comparative Perspective: Germany and Israel

4 units, Win (Tempel)

OXFORD

117W. Social Change in Modern Britain

4-5 units, Aut (Davies)

131. Globalization, Nationalism, and Education

units to be announced, Win (Ramirez)

SANTIAGO

111. Social Heterogeneity in Latin America

5 units, Aut (Valdes)
CENTER FOR SPACE SCIENCE AND ASTROPHYSICS


Director: Robert V. Wagoner

Associate Directors: Umran S. Inan, Roger W. Romani, Philip H. Scherrer


Associate Professors: Bruce B. Lusignan, Roger W. Romani, Howard Zebker

Assistant Professors: Sarah Church, Guenther Walther

Professors (Research): C-W. Francis Everitt, Antony Fraser-Smith, Philip H. Scherrer

Associate Professor (Research): Chris Chyba

Consulting Professors: Alan M. Title, Martin Walt

The center is an interdepartmental organization coordinating teaching and research in space science and astrophysics. Its members are drawn from the Department of Geological and Environmental Sciences in the School of Earth Sciences; the departments of Aeronautics and Astronautics, Electrical Engineering, and Mechanical Engineering in the School of Engineering; the departments of Applied Physics, Physics, and Statistics in the School of Humanities and Sciences; the W. W. Hansen Experimental Physics Laboratory; and the Stanford Linear Accelerator Center.

Research now in progress covers a wide array of investigations and is approached in a variety of ways, including experiments flown on rockets, satellites, and space probes; ground-based observations made from the Hobby-Eberly Telescope, the Wilcox Solar Observatory, and from national observatories; and theoretical research including computer modeling. Topics currently being studied include cosmology, gamma-ray astronomy, gravitation theory and experiments, guidance and control, high-energy astrophysics, ionospheric and magnetospheric physics, microwave and infrared astronomy, planetary sciences, solar physics, solar-terrestrial phenomena, stellar structure, theoretical astrophysics, x-ray and extreme ultraviolet astronomy, and the study of life in the universe. Some of these projects involve opportunities for collaboration with scientists at the Lockheed-Martin Research Laboratory through the Stanford-Lockheed Institute for Space Research, the NASA/Ames Research Center, and the SETI Institute.

Stanford is a member of the Universities Space Research Association, a consortium of universities which operates the Lunar Science Institute in Houston, Texas; the University Corporation for Atmospheric Research in Boulder, Colorado; and the San Diego Supercomputing Consortium. Stanford is the lead institution for the GLAST gamma-ray observatory, the EGRET experiment at the Compton Gamma Ray Observatory, Gravity Probe B, and the Solar Oscillations Investigation on the Solar and Heliospheric Observatory spacecraft (SOHO); and participates in the USA X-ray satellite and the Soft X-Ray Telescope program on the Japanese Yohkoh spacecraft.

Stanford is also a member of the Hobby-Eberly Telescope Consortium which has constructed a 10-meter telescope at the McDonald Observatory of the University of Texas. Full science operations have begun.

The facilities of the center are available to any interested and qualified student, who must be admitted by and registered in a department. The departments of Aeronautics and Astronautics, Applied Physics, Electrical Engineering, Mechanical Engineering, and Physics offer opportunities leading to an M.S. or Ph.D. degree for work in space science or astrophysics. The center also offers opportunities to undergraduates who may, for instance, participate in research projects in their junior or senior years, on a part-time basis during the school year or on a full-time basis during the summer. The Astronomy Course Program operates a small student observatory where students may gain practical experience in astronomical observing. The course list at the end of this entry includes courses of interest to undergraduates, as well as courses primarily of interest to graduate students.

Further information is available from the director.

COURSES

For descriptions, see the listings under the department's section of this bulletin.

AERONAUTICS AND ASTRONAUTICS

236A,B,C,D. Spacecraft Design

271A. Dynamics and Control of Aircraft and Spacecraft

279. Space Mechanics

290. Problems in Aeronautics and Astronautics

ENGINEERING

106. Planetary Exploration

249. Introduction to the Space Environment

350. Radioscience Seminar

352. Electromagnetic Waves in the Ionosphere and Magnetosphere

354. Introduction to Radio Wave Scattering

356. Elementary Plasma Physics: Principles and Applications

453. Geomagnetically Trapped Radiation

PHYSICS

15. The Nature of the Universe

16. Cosmic Horizons

18N. Stanford Introductory Seminar: Revolutions in Concepts of the Cosmos

27. Evolution of the Cosmos

50. Astronomy Laboratory and Observational Astronomy

81Q. Stanford Introductory Dialogue: Lookback Time in Cosmology

82Q. Stanford Introductory Dialogue: Expanding Cosmic Horizons

100. Introduction to Observational and Laboratory Astronomy

160. Introduction to Stellar and Galactic Astrophysics

161. Introduction to Extragalactic Astrophysics and Cosmology

260. Introduction to Astrophysics

262. Introduction to Gravitation

301. Astrophysics Laboratory

360. Physics of Astrophysics
361. Stellar and Galactic Astrophysics
362. Extragalactic Astrophysics and Cosmology
363. Solar and Solar-Terrestrial Physics
364. Advanced Gravitation
463. Special Topics in Astrophysics

SPANISH AND PORTUGUESE

Emeriti: (Professors) Fernando Alegria, Aurelio M. Espinosa, Jr., Bernard Gicovate, Isabel Magaña Schevill, Sylvia Wynter
Chair: Yvonne Yarbro-Bejarano
Professors: Mary L. Pratt (on leave 2000-01), Michael P. Predmore, Jorge Ruffinelli, Guadalupe Valdés, Yvonne Yarbro-Bejarano
Assistant Professors: Claire Fox, Fernando Gómez, Richard Rosa (on leave 2000-01), Lucía Sá
Professor (Teaching): María-Paz Haro
Courteous Professors: John Felsíner, Hans U. Gumbrecht, Ramón Saldivar
Courtesy Associate Professor: James A. Fox
Courtesy Assistant Professor: Paula Moya
Senior Lecturers: Lyris Wiedemann (Portuguese Language Director); Susan Cashion (by courtesy), Irene Corso
Lecturers: Claudia Angelelli, Jeffrey Bersett, José Cartagena-Calderón, Diana Garcia, Shelley Garrigan, Clémence Jouet-Pastré, Caridad Kenna, Patrice Marks, Alice Miano, Joan Molitoris, Consuelo Peraza, Karen Schell, Ana M. Sierra, María-Cristina Urruela, Hae-Joon Won, Douglas Young
Acting Assistant Professor: Alicia Rios
Writer-Arlist-in-Residence: Cherre Moraga
Visiting Professors: Gordon Brotherston, Luisa Campuzano, John Dagenais
Spanish Language Coordinator: Alice Miano
Majors and Minors Coordinator: José Cartagena-Calderón
Undergraduate Advisers: Michael Predmore, Lucía Sá
Graduate Adviser: Yvonne Yarbro-Bejarano

The department is committed to four main educational purposes: (1) to provide students with expert training in the Spanish and Portuguese languages at all levels and to enable them to develop their skills in these languages according to their goals and interests; (2) to acquaint students with the literatures and cultures of the Spanish and Portuguese speaking world (Iberia, Latin America, the United States) in terms of both contemporary realities and 1,000 years of written and oral tradition; (3) to prepare undergraduates for advanced study in Iberian, Latin American, and Luso-Brazilian languages, literatures, and cultures; and/or in language education, and (4) to provide doctoral students with advanced research skills and teachers, in preparation for careers as university teachers or related roles.

The faculty represent a broad range of interests and approaches. In general, the department's programs are characterized by: (1) a commitment to undergraduate and graduate teaching at the highest intellectual level, (2) a strong interdisciplinary focus that combines the study of literature with that of other forms of cultural expression, (3) a sociohistorical perspective on language, literature, and culture, (4) an effort to maintain a balance among Latin American, Iberian, and U.S. Latino fields, and (5) language study tailored to a range of educational intellectual goals and native and non-native experience with the Spanish and Portuguese languages.

The department works closely with the Center for Latin American Studies, El Centro Chicano, the Overseas Studies programs in Santiago, Chile, and Puebla, Mexico, and selected overseas programs in Spain. It makes extensive use of the resources of the language laboratory and the Language Center. The university library maintains world class collections in Latin American and Iberian Studies and one of the largest research archives in the country in Chicano history and literature. The Hoover Library is a valuable resource for particular research topics on Spanish and Latin American intellectual history. Department faculty teach in the School of Education. Comparative Literature, Comparative Studies in Race and Ethnicity, Drama, Feminist Studies, Film Studies, Introduction to the Humanities Program, and Modern Thought and Literature. The department houses a Brazilian Writer-in-Residence program developed in cooperation with the Brazilian Ministry of Culture, and hosts visiting faculty from Spain and Latin America on a regular basis.

UNDERGRADUATE PROGRAMS

BACHELOR OF ARTS

Students who declared a Spanish major prior to June 1, 1996 should see the former requirements found in previous versions of the Stanford Bulletin or in the department's Undergraduate Handbook, or see the undergraduate adviser.

The major in Spanish is designed to enable students to develop a concentration in a particular area of interest, accompanied by basic work in two secondary areas. Students are normally expected to declare the major during the sophomore year, but it is possible to declare during the junior year as well, particularly after overseas study at Santiago or Puebla.

The major in Spanish requires 50 units in addition to completion of second-year Spanish (13, 13B or equivalent). Course work for the major is grouped under the following subject areas:

1. Latin American/Caribbean studies (including Brazil)
2. Iberian Studies (including Portugal)
3. U.S. Latino studies
4. Language in the Spanish-speaking world
5. Luso-Brazilian language and culture

Students are required to take four courses in one of these areas, two courses in a second and one in a third. Course work for the major must include:

One quarter of Portuguese language (counts for area 5 above)
Spanish 101, Structure of Spanish (counts for area 4 above)

Spanish 140, Methods of Literary and Cultural Analysis (counts for area 1, 2, or 3 above)

One writing intensive course
Spanish 278, Senior Seminar (writing intensive optional)

All courses in the department numbered 100 or above count toward the major. With the consent of the student's adviser, up to 10 units of relevant course work outside the department and up to 10 units of course work done in English may be counted toward the major. With the consent of the adviser, up to 25 units of relevant course work taken abroad may be counted toward the major. Courses taken credit/no credit do not count toward the major.

How to Declare a Major—Students interested in declaring a Spanish major should see the Majors and Minors Coordinator, José Cartagena-Calderón, or one of the undergraduate advisers, Professors Fox and Rosa. General information on the major is available in the department reception area, Building 260, room 214.

Double Majors—The major in Spanish and Portuguese is designed to combine readily with a second major in another field and with study abroad. Students may not count the same course to fulfill requirements in both majors.

Intensive Summer Program—Stanford University offers first-year intensive language and conversation courses in Spanish during the summer. For further information, contact the department or the Summer Session office.

Courses for Heritage Language Speakers—The department offers a series of second- and third-year courses especially designed for students who grew up in homes where Spanish is spoken and who wish to develop their existing linguistic strengths. The suffix "B" in course numbers below indicates these courses.

Proficiency Notation—Seniors are encouraged to qualify by examination (given every Spring Quarter) for the departmental Language Pro-
4. Luso-Brazilian Language and Culture: recommended are Portuguese
   of the student's adviser, up to 10 units of relevant course work outside
   MINORS
   Director.

   For further information, contact Alice Miano, Spanish
   efficiency Notation on their transcript, which certifies foreign language
   competence. For information concerning the requirements for teaching credentials,
   your request.

   Requirements—Thirty units of course work at the level of Spanish 11
   or above, and/or in Portuguese at any level. Students must take at least
   three courses in one of the following subject areas:
   1. Latin American and Iberian Studies: recommended are Spanish 130,
      131, 132, 133 and 134; and 150, 151, 160, 161.
   2. U.S. Latino Studies: recommended are Spanish 11B, 12B, 13B, 132,
      and courses in the 280 series.
   3. Advanced Language: any combination of second-year Spanish and/
      or first- and second-year Portuguese, plus a selection of 100- and 200-
      level language courses. Recommended: Spanish 203, 204, 205, 206,
   4. Luso-Brazilian Language and Culture: recommended are Portuguese
      11A, 12A, 133, 134, 170, and 171.

   CULTURE AND AREA STUDIES
   This minor is intended for students who wish to focus on developing
   advanced linguistic competence in Spanish and/or Portuguese, or who
   wish to combine acquisition of linguistic competence with the study of
   the literature, thought, culture, or language systems of the Spanish- or
   Portuguese-speaking world.

   Requirements—Thirty units of course work at the level of Spanish 11
   or above, and/or in Portuguese at any level. Students must take at least
   three courses in one of the following subject areas:
   1. Latin American and Iberian Studies: recommended are Spanish 130,
      131, 132, 133 and 134; and 150, 151, 160, 161.
   2. U.S. Latino Studies: recommended are Spanish 11B, 12B, 13B, 132,
      and courses in the 280 series.
   3. Advanced Language: any combination of second-year Spanish and/
      or first- and second-year Portuguese, plus a selection of 100- and 200-
      level language courses. Recommended: Spanish 203, 204, 205, 206,
      207.
   4. Luso-Brazilian Language and Culture: recommended are Portuguese
      11A, 12A, 133, 134, 170, and 171.

   CULTURE AND AREA STUDIES
   This minor is intended for students who wish to study the literature,
   culture, or thought of the Spanish- and Portuguese-speaking world with-
   out necessarily acquiring proficiency in Spanish or Portuguese language.
   Students choosing this minor are strongly encouraged to take language
   courses in Spanish or Portuguese, including reading courses (such as
   Spanish 50 or Portuguese 50). Such courses count toward, but are not
   required for, this minor.

   Requirements—Thirty units of course work in Latin American, Ibe-
   rian, U.S. Latino, or Luso-Brazilian literature, culture, language, and
   thought studied in the original or in translation at the level of Spanish 11
   or above.

   HOW TO DECLARE A MINOR
   For minors in the School of Humanities and Sciences, students must
   complete their declaration of the minor no later than the last day of the
   quarter two quarters before degree conferral. For example, a student
   graduating in June (Spring Quarter) must declare the minor no later than
   the last day of Autumn Quarter of senior year. Students declaring a mi-
   nor should meet with the majors and minors coordinator. General infor-
   mation about the minor is available in the reception area of the depart-
   ment, Building 260, room 214.

   HONORS PROGRAM
   Spanish and Portuguese majors in the junior year, with a grade point
   average (GPA) of 'B+' or better in all major courses, may apply to the
   honors program. Honors students are eligible to participate in the hon-
   ors college at the beginning of their senior year. Students should submit
   an application for the honors program and a proposal outline by the end
   of Winter Quarter of the junior year. Each honors student must write an
   honors essay of 20 to 25 pages under the direction of a faculty member
   who serves as adviser. Work on the essay normally begins in the Spring
   Quarter of the junior year and must be completed by the end of the third
   week of March of the senior year. Consult an undergraduate adviser (Pro-
   fessors Fox or Rosa) for additional information on the honors program.

   OVERSEAS STUDIES
   All majors are strongly encouraged to study abroad. To transfer credits
   from programs abroad, consult the Office of the Registrar. Depending
   on course selections, up to 25 units of course work taken abroad may be
   applied toward the major and 15 units toward the minor in Spanish. Stu-
   dents planning study abroad, or returning from study programs, are en-
   couraged to consult with the majors and minors coordinator or an under-
   graduate adviser to coordinate the course work from abroad with their
   degree program.

   Both the department and Bechtel International Center maintain infor-
   mation banks on study abroad programs. Stanford sponsors the follow-
   ing options:

   STANFORD IN SANTIAGO, CHILE
   The Stanford Program in Santiago, Chile requires one year of college
   Spanish, with preference given to students with more advanced language
   preparation. Course work there is done entirely in Spanish. Detailed in-
   formation, including curricular offerings, is listed in the "Overseas Stud-
   ies" section of this bulletin, or at the Overseas Studies Program (OSP)
   office in Sweet Hall. Internships and research opportunities may be ar-
   ranged for two-quarter students.

   STANFORD IN PUEBLA, MEXICO
   The Stanford Program in Puebla, Mexico requires preparation through
   the level of Spanish 13 (second year third-quarter Spanish) or the equiv-
   alent. The minimum required preparation is completion of Spanish 11
   (second year first-quarter Spanish) or its equivalent by the time of enroll-
   ment in the Puebla program. Students who have completed Spanish 11
   prior to Autumn Quarter but have not yet completed Spanish 13 are re-
   quired to enroll in Spanish 12 or a higher course at Stanford during the
   Autumn Quarter prior to participation in the Puebla program. Course
   work at Puebla is done entirely in Spanish with regular courses at the
   Universidad de las Americas. Detailed information, including curricu-
   lar offerings, is found in the "Overseas Studies" section of this bulletin,
   or at the Overseas Studies Program (OSP) office in Sweet Hall. Research
   opportunities may be arranged.

   BRAZIL AND PORTUGAL
   The University maintains a relationship with the Universidade Estatal
do Rio de Janeiro in Brazil. Students interested in study in Brazil or Por-
   tugal, should contact Professor de Sá or Lyris Wiedemann.

   SPAIN
   The Department of Spanish and Portuguese recommends study in
   Spain with the Hamilton College Academic Year in Spain program, ad-
   ministered by the Department of Romance Languages of Hamilton Col-
   lege in cooperation with faculty members of Williams and Swarthmore
   colleges. Two distinguishing features of this program are: (1) Spanish
   must be spoken at all times, both in and outside of class; all students are
   required to sign a pledge to this effect before their arrival in Madrid; (2)
   the arrangement of independent study projects in lieu of regular cours-
   es. The program is based in Madrid, where the cultural, educational,
   social, and geographical benefits are optimal.

   An additional excellent program recommended by the department is
   the Madrid campus of St. Louis University. This program has many of
   the features of the Hamilton College program. In addition, it has its own
   buildings and facilities located on the outskirts of the University of
   Madrid campus. This is the only U.S. overseas studies program in Spain
   which has received full accreditation by the Spanish authorities.

   Students interested in study in Spain should consult Professors Haro
   or Predmore for information.

   TEACHING CREDENTIALS
   For information concerning the requirements for teaching credentials,
   see the "School of Education" section of this bulletin and the credentials
   administrator, School of Education.

   597
COTERMINAL A.B. AND A.M.

The requirements for the coterminal A.B. are the same as those outlined below for the A.M. No course can count for both the A.B. and A.M. degrees. Contact Graduate Admissions at the Registrar's Office for information.

GRADUATE PROGRAMS

University requirements for the A.M. and Ph.D. degrees are discussed in the "Graduate Degrees" section of this bulletin.

MASTER OF ARTS IN SPANISH

This terminal A.M. degree program is for students who do not intend to continue their studies through the Ph.D. degree. Students in this program may not apply concurrently for entrance to the Ph.D. program. Students must complete a minimum of 45 graduate-level units, 36 of which must have a grade point average (GPA) of 'B' or above.

Requirements—One linguistics course (203, 204, 205, 206, 207); one course in language pedagogy; one course in literary or cultural theory; two 200-or-above courses in Latin American literature and two 200-or-above courses in Peninsular literature; and reading knowledge of one foreign language other than Spanish (preferably Portuguese). Independent study courses (299, 399), and cross-listed courses originating outside the department may not be used to fulfill requirements except by permission of the graduate adviser.

In addition, students may take approved courses in related fields such as classics, comparative literature, education, history of art, linguistics, modern thought, and philosophy.

DOCTOR OF PHILOSOPHY

The requirements of the Ph.D. are: (1) 90 units of graduate-level course work with a grade point average (GPA) of 'B' or above. Units completed toward the A.M. degree can be counted for the Ph.D.; (2) one course in Spanish linguistics, one course on methods of teaching Spanish, and one course on introduction to literary theory; (3) a reading knowledge of Portuguese and one other foreign language; (4) the qualifying paper, the comprehensive, and the University oral examinations, as described below; (5) teaching of three to five courses in the department; (6) completion of a dissertation. Independent study courses (299, 399) and cross-listed courses originating outside the department may not be used to fulfill requirements except by permission of the graduate adviser. For basic residency and candidacy requirements, see the "Graduate Degrees" section of this bulletin. For further information, consult the department's Graduate Student Handbook.

Newly admitted students are required to take an oral proficiency examination in Spanish by the third week of Autumn Quarter to determine the level of previous preparation. The student is required to remedy deficiencies indicated by this examination before a teaching assignment is awarded. In preparation for teaching, Ph.D. candidates must take Spanish 301, and/or Spanish 300 in the first year.

In consultation with the adviser, students select one major field of study from the following: (1) Spanish Literature of the Golden Age, (2) Modern Spanish Literature, (3) Spanish-American Literature to Independence, (4) Spanish-American Literature of the 19th and 20th Centuries, (5) Chicano Literature. In addition, candidates select two secondary areas of study outside the major field from the following: (1) Spanish Medieval Literature, (2) Spanish Literature of the Golden Age, (3) Modern Spanish Literature, (4) Spanish-American Literature of the Colonial Period, (5) Spanish-American Literature from Independence, (6) Chicano Literature, (7) Literary Theory, (8) Linguistics, (9) Spanish-American Film, (10) Brazilian Literature.

At least four courses must be taken in the major field of study. At least two courses must be taken in each secondary area. Students whose major field is in Spanish-American or Chicano Literature must choose one secondary area in Peninsular literature and vice versa. One secondary area of concentration may be taken outside the department in consultation with the adviser.

In addition to the department's course offerings, students may take relevant courses with the approval of their adviser in other departments and programs, such as the graduate programs in Comparative Literature, Feminist Studies, History, Humanities, or Modern Thought and Literature. It is also possible to complete a minor in another department with approval of the adviser. Normally, not more than 25 units are taken outside the department.

After the first year of study, the student's progress is evaluated by the faculty to determine whether continuation to the Ph.D. is recommended and whether there are particular areas where improvement is needed. For this evaluation, students submit a research paper of approximately 20 pages by the first week of Autumn Quarter of the second year. The requirements for this paper are outlined in the Graduate Student Handbook.

If approval of the qualifying paper is granted, the student should file a formal application for candidacy no later than the end of the second year, as prescribed by the University. Course requirements are usually completed by the third year of study. A written comprehensive examination on the major field and secondary areas is then taken. The examination is based on a list of readings, selected in consultation with the adviser, which integrates major and secondary topics in both Peninsular and Latin American Studies. At this time, students hand in a long research paper to be evaluated by the faculty. For further details, consult the Graduate Student Handbook.

Following the comprehensive examination, students should find a topic requiring extensive original research and request that a member of the department serve as dissertation adviser. The student must complete the Reading Committee form and request that the chair approve a committee to supervise the dissertation. The committee may advise extra preparation within or outside the department, and time should be allowed for such work. The University oral examination usually takes place one or two quarters after passing the comprehensive examination. The oral examination covers plans for the dissertation based on a prospectus approved by the committee (15 to 20 pages), and may be taken in English, Spanish, or Portuguese.

The dissertation must be submitted to the reading committee in substantially final form at least four weeks before the University deadline in the quarter during which the candidate expects to receive the Ph.D. degree. Ph.D. dissertations must be completed and approved within five years from the date of admission to candidacy. Candidates taking more than five years must apply for reinstatement of candidacy.

Ph.D. MINOR

For a minor in Spanish or Portuguese, the student must complete 25 units, with a grade point average (GPA) of 'B' or above, selected from courses numbered 200 or higher.

Students who choose a minor in another department should consult with advisers in that department.

JOINT PH.D. PROGRAMS

The Department of Spanish and Portuguese participates in the Graduate Program in Humanities leading to a joint Ph.D. degree in Spanish and Humanities. For a description of that program, see the "Interdisciplinary Studies in Humanities" section of this bulletin.

COURSES

(WIM) indicates that the course meets the Writing in the Major requirements.

OVERVIEW

1. Stanford Introductory Seminars, freshman preference (110N-119N)
2. First- and Second-Year Language (1-99)
3. Advanced and Specialized Language (100-129)
4. Literature, Culture, Linguistics, and Theory (130-399)
   a) Undergraduate Courses (130-199)
   b) Courses for Advanced Undergraduates and Graduates (200-299)
   Language, Linguistics, and Theory (200-212)
   Peninsular Literature (213-239)
Latin American Literature (240-279)
Chicano Literature (280-289)
Individual Work (299)

5. Graduate Seminars (300-399)
Linguistics, Methodology, and Literary Theory (300-313)
Peninsular Literature (314-339)
Latin American Literature (340-369)
Luso-Brazilian Literature (370-379)
Chicano Literature (380-389)
Individual Work (399)
Dissertation Research (802)

Courses bearing the suffix "E" are taught in English and do not assume competence in another language. All other courses require some knowledge of Spanish or Portuguese, and may be given in those languages or bilingually.

STANFORD INTRODUCTORY SEMINARS

110N. Stanford Introductory Seminar: Introduction to Chicana/o Literature and Visual Art—Preference to freshman. Hands-on introduction to the methods and topics of archival research on the visual and verbal arts and their socio-historical context. Students develop original research projects using the digital archive "ChicanaArt," and the Special Collections in Green Library, which house the papers of major Chicana/o artists, writers, activists, and intellectuals. Slide/presentations by invited artists and presentations by students on their research. GER:3a,4b (DR:3 or 7)
3-5 units, Aut (Yarbro-Bejarano)

111N. Stanford Introductory Seminar: Contemporary Spain—The Challenge of Change, from Fascism to Democracy (1939 to Present)—Preference to freshmen. The years marked by experimentation and change in many areas of life in Spain. Society and culture from postwar times and the transition years, from the Franco regime to the present democratic state. Students research projects on the topics and issues; discussions. Prerequisite: AP (4-5) in Spanish language or literature, or equivalent knowledge. GER:3a (DR:7)
3-5 units, Aut (Haro)

112N. Stanford Introductory Seminar: The U.S.-Mexico Border Region in Film and Literature—Preference to freshmen. Targeted at students who are heritage speakers of Spanish, or who have scored a 4 or 5 on the AP exam in Spanish. Introduces the wide range of cultural production about the border region, highlighting the U.S. and Mexican viewpoints. Topics: free trade, the maquila system, interethic relations, women’s issues, and migration. Readings from novels and essays by Chicana/o, Mexican, and Anglo authors. Weekly screenings of movies and videos from classic Hollywood and Mexican study productions to independent features produced in the border region. Assignments stress the development of basic skills in literary and visual analysis, and oral production. (In Spanish and English) GER:3a,4b (DR:3 or 7)
3-5 units, Spr (Fox)

114N. Stanford Introductory Seminar: Lyric Poetry—Preference to freshmen. Aimed at students with considerable competence who may be interested in increasing their language skills. Introduction to the basic elements and expressive devices of lyric poetry: multidimensional language, denotation, connotation, image, metaphor, symbol, allegory, paradox, irony, meaning, idea, rhythm, and meter. These primary elements of poetry are studied through representative poems of outstanding poets of Spain and Latin America of the late 19th and early 20th century: G. A. Bécquer, Rosalía de Castro, Rubén Darío, Miguel de Unamuno, Antonio Machado, García Lorca, Pablo Neruda, and Gabriela Mistral. (In English and Spanish) GER:3a (DR:7)
3-5 units, Spr (Predmore)

175Q. Stanford Introductory Seminar: Latin American Heroes and Heroines in Film and Literature—Preference to sophomores. Focus is on several historical periods in Latin America as seen through cinema and literature. Latin American cinema reenacts historical situations and expresses "Latin American perspectives, ideologies, and how Latin America would like to be remembered in history. Silent films on the independence of Chile ("The Husher of Death," by P. Sienna); and the cinematic representation of other crucial moments and figures (the Colombian "Violence" era in the 50s, Peronism in Argentina, the Massacre of Tlatelolco in Mexico; and historical figures, e.g., San Martín, Eva Peron, and singer Carlos Gardel in Argentina, Sandino in Nicaragua; Che Guevara in Cuba; Frida Kalho in Mexico, and Princess Joaquina in Brazil). Students compare fictional accounts to more conventional history books and discover in film a special form of historiography. (In Spanish and English)
3-5 units, Win (Ruffinelli)

193Q. Stanford Introductory Seminar: Spaces and Voices of Brazil—Preference to sophomores. Introduces the fundamental aspects of Brazilian culture through a general view of Brazil’s five cultural-geographical regions and an analysis of figures which contributed to shape the image of modern Brazil. Discussions are fostered by analysis of materials covering: Carmen Miranda, Lula, Antônio Carlos Jobim, Jorge Amado, Zelia Gatai, Pelé, Chico Mendes, Benedita da Silva, Chico Buarque de Holanda, etc.
3-5 units, Spr (Wiedemann)

LANGUAGE PROGRAM

SPANISH

Note—Students registering for the first time in a first- or second-year course must take a placement test if they had any training in Spanish before entering Stanford. All entering students who have not taken the Advanced Placement (AP) Exam and received a score of 4 or 5 must take Part I (written) of the placement test on-line during the summer, at http://language.stanford.edu/spanish, followed by Part II (oral), to be administered on campus (9/24). Consult the Stanford Language Center for further information or http://language.stanford.edu/.

Completion of Spanish 2A, 3, or 5C, or Portuguese 1B fulfills the University language requirement.

Students who have never studied Spanish before should enroll in Spanish 1. Students who have studied Spanish before entering Stanford should take the placement test to determine the appropriate course for them. Students who have passed the AP exam with a 4 or 5 are exempted from the test, and are eligible for 10 units of credit in Spanish. Some of these students are prepared to enter the 100-level courses, others need to enroll in one of the second-year courses (11, 12, 13). These students may determine their own placement or consult a department advisor to determine the most appropriate course for them.

Students who grew up in homes where Spanish is spoken should take the placement test for the special series of courses (11B, 12B, 13B) designed for home background speakers. The bilingual series fulfills the language requirement at Stanford. The placement exam can be found at http://language.stanford.edu/homebackground.

A grade of 'C' or better is required to enter the next higher course in the language sequence. Language courses cannot be repeated for credit. Auditors are not permitted in language courses.

FIRST YEAR

1,2,3. First-Year Spanish—By the end of the sequence, students are able to engage in interactions with speakers of Spanish for a variety of purposes and contexts using socially and culturally appropriate forms for participating in conversations, establishing relationships with others, providing and obtaining information, expressing feelings and emotions, and expressing opinions. Students will understand and interpret the written and spoken language on a variety of topics; manifest an awareness of the social and cultural influences shaping the production of oral and written texts in the Spanish- and English-speaking world; and present information, concepts, and ideas to an audience of listeners or readers on a variety of academic topics. Completion of 3 fulfills the University’s language requirement.

5 units, Aut, Win, Spr (Staff)
1A,2A. Accelerated First-Year Spanish—Completes the first-year language sequence in two rather than three quarters. Recommended only for students who have previous knowledge of Spanish or a strong background in another Romance language. 2A fulfills the University language requirement.

5 units, Aut, Win, Spr (Staff)

9A,B,C. Intensive First-Year Spanish—Stanford graduate students restricted to 9 units may take two or three courses in the series for a total of 9 units, or one course for 5 units. Upon completion, students are able to engage in interaction with speakers of Spanish for a variety of purposes and in a variety of contexts, using socially and culturally appropriate forms for participating in conversations; establish relationships with others; provide and obtain information; and express feelings, emotions, and opinions. Students will understand and interpret written and spoken language on a variety of topics; manifest growing awareness of the social and cultural influences shaping the production of oral and written texts in the Spanish- and English-speaking worlds; and present information, and cultural influences shaping the production of oral and written texts in the Spanish- and English-speaking worlds; and present information,

10. Beginning Oral Communication—For students who have completed or are currently taking Spanish 2 and who wish to devote additional class time to developing pronunciation, usable vocabulary, and speaking skills. May be repeated once for credit.

2 units, Aut, Win, Spr (Staff)

SECOND YEAR

11C,12C,13C. Second-Year Spanish, Cultural Emphasis—Students become aware of and are able to use socioculturally appropriate language in a variety of situations, formal and informal, academic and professional. Greater emphasis is placed on the presentational language, giving academic presentations and writing reports on topics of interest to students who develop the ability to comprehend and interpret oral and written language. Can be taken in any quarter.

4 units, Aut, Win, Spr (Staff)

11R,12R,13R. Second-Year Spanish, Emphasis on International Relations—Content-based approach, focusing on politics in the Spanish-speaking world and international relations; and the Hispanic world today, geographically, socially, and economically. Develops correct usage in contemporary Spanish through the reinforcement of reading, writing, listening, and speaking abilities. Primary texts from Latin America and Spain. Activity-based method. Fieldwork projects for an optional unit.

4-5 units, Aut, Win, Spr (Angelelli, Urruela)

FOR HERITAGE LANGUAGE STUDENTS

11B,12B,13B. A special series designed for students who grew up in homes where Spanish is spoken, and who wish to develop their existing linguistic strengths.

11B. Second-Year Spanish for Heritage Language Students—Emphasis is on developing the ability to successfully communicate orally or in writing with persons with whom students come into personal contact. Intensive and extensive reading of selected texts.

4-5 units, Aut (Staff)

12B. Written and Spoken Language for Heritage Language Students—Emphasis is on developing the ability to understand, interpret, and critically analyze a variety of print and non-print materials, e.g., movies, radio and television broadcasts, short novels, short stories, and newspaper editorials. Extensive reading of texts from a number of fields and disciplines. Writing of summaries and reviews. Prerequisite: 11B or consent of instructor.

3-5 units, Win (Staff)

13B. Multipurpose Communication for Heritage Language Students—Emphasis is on developing the bilingual students’ abilities to use the oral and written language appropriately for a variety of purposes, focusing on the development of styles and registers used in more formal settings. Prerequisite: 12B or consent of instructor.

3-5 units, Spr (Staff)

15. Intermediate Oral Communication—For students who have completed or are enrolled in any second-year Spanish course, and for students trained in grammar oriented courses who wish to improve oral skills. Develops appropriate speech strategies and communicative proficiency in Spanish, creating opportunities to act out everyday life situations encountered in a Spanish-speaking environment. Listening and reading materials are used to develop interpretive abilities and knowledge of cultural context. May be repeated once for credit.

3 units, Aut, Win, Spr (Staff)

18M,19M. Spanish for Heritage Language Pre-Med Students—Designed for pre-med students who grew up in homes where Spanish is spoken or who have learned Spanish as a foreign language and possess a considerable command of Spanish. Focus is on developing the ability to provide information on health-related topics to Spanish speakers in the U.S. Students should enroll in both quarters to be able to communicate effectively with native speakers, one course per quarter. Students participate in the organization and delivery of information on preventive health care in a workshop setting to a Spanish-speaking community outside campus.

3-4 units, Win, Spr (Sierra)

50. Reading Spanish—For students who have already taken Spanish for at least one full year or have superior reading proficiency in another Romance language. Emphasis is on the comprehension of academic texts. Fulfills University reading requirements for advanced degrees if students earn at least a grade of 'B.'

3 units, Spr (Sierra)

99. Language Specials—With consent of department only. See instructor for section number.

1-5 units (Staff)

100. Advanced Oral Communication—For students who have completed second-year Spanish or who have oral skills above the intermediate level. Interactive activities require students to persuade, analyze, support opinions, and gather and interpret others’ points of view. Focus is on vocabulary enrichment with emphasis on idiomatic expressions. Cultural, literary, political, and journalistic readings stimulate discussion about issues related to the Spanish-speaking world. May be repeated once for credit. Prerequisite: 13 or equivalent.

3 units, Aut, Win, Spr (Staff)

103B. Advanced Spanish for Heritage Language Students—Enrollment limited to students who grew up in homes where Spanish is spoken or who have had extensive experience (e.g., 3-5 years residence) in Spanish-speaking countries. Develops competence in Spanish for academic and professional purposes, including giving presentations, writing essays, and discussing academic subjects.

4 units, Aut (Cartagena-Calderon)

104B. Special Topics in Advanced Grammar and Composition for Heritage Language Students—Grammar and composition workshop intended for heritage language speakers with advanced oral and written language skills, who wish to improve their ability to communicate in Spanish through writing. The mechanics of writing (written accents, spelling, syntax, etc.) and the art of writing itself (brainstorming, planning, outlining, drafting, editing, and rewriting), introduce the more complex aspects of Spanish grammar. Provides students with the necessary skills to successfully undertake courses that require strong compe-
tence in academic Spanish. Students are encouraged to take such a course during the quarter of instruction.

3-4 units, Win (Cartagena-Calderón)

PORTUGUESE

FIRST YEAR

1,2,3. First-Year Portuguese—For students with no prior study of Portuguese or Spanish. By the end of the first-year sequence of the Portuguese language program, students are able to engage in interactions with speakers of Portuguese for a variety of purposes and in a variety of contexts using socially and culturally appropriate forms for participating in conversations, establishing relationships with others, providing and obtaining information, expressing feelings, emotions, and opinions. Students will understand and interpret written and spoken language on a variety of topics; manifest growing awareness of the social and cultural influences shaping the production of oral and written texts in the Portuguese-speaking world; and present information, concepts, and ideas to an audience of listeners or readers on a variety of academic topics. Completion of 3 fulfills the University’s language requirement.

1. First-Year Portuguese (Part 1)—Normal-paced. Follows a proficiency-oriented approach, emphasizing speaking and oral comprehension. Students learn the language as they contrast Brazilian culture with their own. Lab.

5 units, Aut (Staff)

2. First-Year Portuguese (Part 2)—Continuation of 1. Normal-paced. Emphasizes speaking and oral comprehension proficiency and promotes the beginning of development of reading and writing skills. Lab. Prerequisite: 1.

5 units, Win (Staff)

3. Second-Year Portuguese (Part 3)—Continues emphasizing speaking and oral comprehension proficiency and the development of reading and writing skills. Literary and journalistic readings, studying of Brazilian popular music, and viewing short documentaries are the basis for discussions on Brazilian culture and current events. Lab. Prerequisite: 2 or equivalent.

5 units, Spr (Staff)

1A,2A. Accelerated First-Year Portuguese—Recommended for students with at least two years of formal study of a Romance language. By the end of the first-year sequence of the Portuguese language program, students are able to engage in interactions with speakers of Portuguese for a variety of purposes and in a variety of contexts using socially and culturally appropriate forms for participating in conversations, establishing relationships with others, providing and obtaining information, expressing feelings, emotions, and opinions. Students will understand and interpret written and spoken language on a variety of topics; manifest growing awareness of the social and cultural influences shaping the production of oral and written texts in the Portuguese-speaking world; and present information, concepts, and ideas to an audience of listeners or readers on a variety of academic topics. Completion of 2A fulfills the University’s language requirement.

1A. Accelerated First-Year Portuguese (Part 1)—Fast-paced. Follows a proficiency-oriented approach, emphasizing speaking and oral comprehension. Students learn the language as they contrast Brazilian culture with their own. Lab.

5-3 units, Aut, Win, Spr (Wiedemann)

2A. Accelerated First-Year Portuguese (Part 2)—Continuation of 1A. Fast-paced. Recommended for students with a background in a Romance language. Emphasizes speaking and oral comprehension proficiency and promotes the beginning of reading and writing skills development. Literary and journalistic readings, Brazilian popular music, and short documentaries are the basis for discussions on Brazilian cultural aspects and current events. Prerequisite: 1A or equivalent.

3-5 units, Aut, Win, Spr (Wiedemann)

11A,12A. Accelerated Second-Year Portuguese—By the end of the second-year sequence of the Portuguese language program, students are able to engage in interactions with speakers of Portuguese belonging to different sociolinguistic groups, using socially and culturally appropriate forms. Students will understand and interpret written and spoken language on a variety of topics; judge, discuss, and defend points of view; work in increasing depth on academic topics of their own interest in the target language; and present original information, concepts, and ideas to an audience of listeners or readers on a variety of genres and with an array of different purposes.

11A. Accelerated Second-Year Portuguese (Part 1)—Fast-paced. Three of the five cultural-geographical regions of Brazil are studied as a means of developing listening, speaking, reading, and writing proficiency. The regions are contrasted through discussions fostered by viewing movies, plays, short stories, journalistic materials, Brazilian popular music, and by listening to speakers from each region. Prerequisite: first-year sequence, equivalent, or consent of instructor.

3-5 units, Aut, Win, Spr (Wiedemann)

12A Accelerated Second-Year Portuguese (Part 2)—Continuation of 11A. Fast-paced. Provides further development of listening, speaking, reading, and writing proficiency. Two of the five cultural-geographical regions of Brazil and other Portuguese-speaking areas are studied and contrasted through discussions fostered by viewing movies, reading longer texts of different genres, Brazilian popular music, and listening to speakers from each region. Prerequisite: 11A, or consent of instructor.

3-5 units, Aut, Win, Spr (Wiedemann)

50. Reading Portuguese—For students with superior reading proficiency in Spanish. Reading competence for research and courses in Lusobrazilian studies. Overview of grammar. Literary, journalistic, and academic readings. Fulfills University reading requirement for advanced degrees.

3 units, Spr (Staff)

100. Advanced Portuguese Conversation—Conversation practice recommended as a supplement to the second-year sequence. Prerequisite: 12A, equivalent, or consent of instructor.

2-3 units, Spr (Staff)

109A. Practicum: Portuguese for Speakers of Spanish (Part 1)—Recommended for graduate students of literature. Accelerated introduction to Portuguese for speakers of Spanish. Follows a proficiency-oriented approach, emphasizing speaking and oral comprehension. Students learn the language as they contrast Brazilian culture with their own. Lab. Prerequisite: advanced reading competence in Spanish.

3-4 units, Aut (Wiedemann)

109B. Practicum: Portuguese for Speakers of Spanish (Part 2)—Continuation of 109A. Emphasizes speaking, oral comprehension, and reading proficiency, and promotes the beginning of the development of writing skills.

2-3 units, Win (Wiedemann)

ADVANCED AND SPECIALIZED LANGUAGE

Only courses bearing the suffix "E" are given in English and do not require competence in Spanish or Portuguese. Otherwise, the following courses are taught in the Spanish or Portuguese language, and competence at the level of Spanish 13 or Portuguese 12A is required. Completion of three courses at the 100 level is normally required for undergraduates to enroll at the 200 level. 300 level courses are graduate seminars.

101. Structure of Spanish—Advanced study, designed to help students understand the grammatical system of Spanish and how it functions. A description and analysis of the main topics of Spanish grammar: types of clauses, relative pronouns, verb aspect and tenses, review of preposi-
102. Composition and Writing Workshop—Focus is on individual development of the ability to write in Spanish. Emphasis is on style and diction, and on preparing and writing essays on literary topics. Non-Spanish majors or minors may choose topics more closely related to their studies for projects. Prerequisite: two years of college Spanish, bilingual Spanish series at Stanford, or equivalent. GER:3a (DR:7) (WIM)

4 units, Win (Gómez)

110. Introduction to Translation—Designed to familiarize students with basic translation skills and strategies. A variety of text types illustrate different types of translation (general, technical, medical, legal). Service learning component provides an opportunity to put into practice the translation principles discussed. Prerequisites: 101 and 102B; advanced command of Spanish and English.

4 units, Win (Angelelli)

121L, 122L. Spanish for Legal Professions—Open only to law students and designed for lawyers who need to work with Spanish-speaking clients. Legal terminology is combined with a review and practice of grammar for adequate oral and written expression in legal situations. Comparison of the Common Law and Roman Law systems, and some issues where the two legal systems might not correspond. Uses legal documents and materials. Law semester calendar.

3-5 units (Angelelli)

121M, 122M, 123M. Spanish for Medical Students—(Same as Health Research and Policy 280, 281, 282.) Geared to achieve a practical and rapid command of spoken Spanish. Topics: the human body, hospital procedures, diagnostics, food, and essential phrases for on-the-spot reference when dealing with Spanish-speaking patients. Series can be taken independently, depending on the level of prior knowledge.

3 units, Aut, Win, Spr (I. Corso)

125. Spanish for the Professions—Third-year level, aimed at students who wish to continue developing their Spanish language skills in relation to their particular discipline of study. Written and oral presentations required. Prerequisite: 13, 13B, or equivalent.

4-5 units (Staff)

LITERATURE, CULTURE, LINGUISTICS, AND THEORY

UNDERGRADUATE

130, 131, 132, 133, 134, 135. Cultural Perspectives—For students interested in the culture of Spanish and Portuguese speakers. Readings and topics for discussion and composition include socio-cultural and historical material from Spain, Portugal, Brazil, Spanish America, Dominican Republic, and the Mexican-Chicano, PuertoRriqueño, and Cuban heritage. Art, current events, folklore, history, language, and literature topics are supplemented by slides, movies, tapes, and occasional field trips.

130. Spanish Cultural Perspectives—GER:3a (DR:7)

4 units, Spr (Haro)

131. Spanish American Cultural Perspectives

4 units, not given 2000-01

132. Mexican and Chicano Cultural Perspectives

4 units, Win (Gonzalez)

133E. Portuguese Cultural Perspectives

4 units, not given 2000-01

134. Brazilian Cultural Perspectives

4 units (Sá) not given 2000-01

135. Caribbean Cultural Perspectives

4 units, not given 2000-01

140. Introduction to Methods of Literary and Cultural Analysis—For students with little or no background in literary analysis. The basic terminology of literary theory and critical approaches to literature through textual analysis. Emphasis varies with instructor. Prerequisite: 13, 13B, or equivalent.

3-5 units, Win (Gómez)

141. Contemporary Spanish Women Writers—The speed of change and unique vitality of contemporary Spain is illustrated by studying women, particularly in the literary arena. Works by prominent women narrators of Franco’s era (Matute, Martín Gaite). Novels by the new generations of women writers (Tusquets, Montero, Mayoral, Ortiz, Etxeberria) who are transforming their experiences, values, and ideologies into a new literature about the complex relationships among gender, creativity, and social mores. The feminist consciousness, how it has developed to this day, and how it is changing to face the challenges of our world. GER:3a, 4c (DR:7)

3-5 units, Win (Haro)

143E. Latinos/as and Popular Culture in the United States—The impact of Latino (and some Latin American and occasionally Spanish) artists on popular culture in the U.S.; the role of the music industry in the construction of “Latin” culture in the national imaginary since the early 20th century; the strategies employed by Latino artists to resist and/or contribute to, sometimes simultaneously, the commodification of Latino cultures; and the implications of these issues for the cultural citizenship of Latinos as they reinvent their cultural, social, political, and economic identities. (In English)

3-5 units, Win (Negrón)

150, 151. Spanish Literature—Basic introduction to Spanish Peninsular literature. Sequence deals with major works from several periods and genres, preparing for more specialized 200-level courses. Prerequisite: 13, 13B, or equivalent.

150. Spanish Literature I—The spirit of Spain in its early literature. Medieval and Golden Age masterpieces that establish and reflect Spain’s unique identity (Christians, Jews, Moors) and create its traditions. Close reading of El libro de buen amor, Poema del Cid, La Celestina, Lazarillo de Tormes, El Buralde de Sevilla, Garcilaso, Cervantes, Góngora, Lope de Vega, Calderón.

3-5 units, Aut (Cartagena-Calderón)

151E. Introduction to Modern Peninsular Spanish Literature—Representative works of Spanish literature from the 1830s to the 1930s: Larra, Espronceda, Bécquer, Rosalía de Castro, Galdós, Unamuno, Valle-Inclán, Machado, and Lorca. Emphasis is on a close reading of the texts in relation to the “problem of Spain” within the democratic tradition of Spanish liberalism. (In English) GER:3a (DR:7)

3-5 units, Win (Predmore)

160, 161. Spanish American Literature—Introductory survey of major works from several periods and genres. Prerequisite: 13, 13B, or equivalent.

160E. Latin America before Independence—Historical view of mostly pre-U.S. Americas, focusing on pre-independence/pre-19th century Latin America. Major themes: indigenous culture and colonial mutations under Spanish domination. Glyph culture, literary and legal documents, maps and paintings, official historical documents and critical scholarship. Emphasis is on areas covered by Stanford Overseas Program. (In English) GER:3a, 4a (DR:2 or 7)

3-5 units, not given 2000-01

161. Latin American Literature—Continuation of 160, from independence to the present. Readings from a range of genres including essay, poetry, short story, and the novel. GER:3a, 4a (DR:2 or 7)

3-5 units, Spr (Ruffinelli)

168E. Chilean Studies: Modern Chilean Culture through Music, Film, and Literature 1945-1997—(Same as Latin American Studies 120.) Recommended for students planning to attend the Santiago program and open to all students. Introduction to the history, culture,
politics, and literature of Chile, mainly in the 20th century. (In English)
3-5 units, Spr (Missana)

170. Brazilian Literature—Introductory survey of major works from several periods and genres. 

170. Brazilian Literature I—Survey of Brazilian literature, from the Colonial Period through the 19th century. Authors: Gregório de Matos, Tomás Antonio Gonzaga, Antonio Gonçalves Dias, José de Alencar, Nísia Floresta, Bernardo Guimarães, and Machado de Assis. 
3-5 units, not given 2000-01

171. Brazilian Literature II—Survey of 20th-century Brazilian literature, fiction, poetry, and essays. Themes: “the urban gaze” (Mário de Andrade, Oswald de Andrade, Patrícia Galvão, Manuel Bandeira, Clarice Lispector, Dalton Trevisan, and Ledusha) and “regional (dis)locations” (Euclides da Cunha, Gilberto Freyre, Raquel de Queirós, Graciliano Ramos, João Cabral de Melo Neto, João Guimarães Rosa, and Márcio Sousa). (In Portuguese or English, depending on the students’ fluency.)
3-5 units, not given 2000-01

172E. Reading the Rain Forest—For decades, the Amazon has been one of the most debated regions of the world. The Amazon is looked at from various perspectives and genres: indigenous narratives, travel-writing, environmentalist studies, literature, and film. (In English)
GER:3a,4a (DR:2 or 7)
3-5 units, Aut (Sá)

174E. The Picaresque Novel—Picaresque fiction is viewed as one of Spain’s primary contributions to world literature. Surveys key works of Iberian fiction written in the picaresque mode: Jaume Roig’s Spill, Lazarillo de Tormes; Mateo Aleman’s Guzmán de Alfarache; Quevedo’s Bucón; and Cervantes’s Colloquio de los perros. What constitutes a literary genre (and is the picaresque novel one?). What are the critical problems associated with first person and especially pseudo-autobiographical narrative? What are the relations among society, myth, folklore, and literature? How do Spanish picaresque fictions of the Golden Age fit into the larger scheme of roguish fictions stretching from Antiquity to the present? (In English)
3-5 units, Spr (Dagenais)

179E. Teatro America Workshop: The Theater of Native/Chicano America—The contributions of indigenous Americans to Native American, Chicano, and Latin American popular, radical, and grassroots theater. (In English) GER:3a,4b (DR:3 or 7)
5 units, Spr (Moraga)

180E. Introduction to Chicana/o Cultural Studies—Interdisciplinary examination of key literary and visual texts and issues in the chicana and chicano culture. (In English) GER:3a (DR:7)
5 units, Win (Yarbro-Bejarano, Rosado)

3-5 units, Win (Haro)

193. Only Almodóvar—The enfant terrible of the 80s, whose eccentric, hilarious, gender bending melodramas helped reinvent post-Franco Spain; and a box-office success and the winner of national and international awards, including the Oscar for the Best Foreign Film 2000. Is he really the genius critics rave about? Is his cinematography as unique, outrageous, and transgressive as people say? The themes, characters, places, objects, cinematic perspectives, and aesthetics of some of Almodóvar’s most emblematic films.
2-3 units, Spr (Haro)

194. Women in Film and Films by Women: A Different Gaze?—The traditional female representations in Spanish films made from the male perspective. The work of women directors who have broken through the male dominated field. Is there a distinctive “feminine approach” to film making in the Hispanic world? How do female directors’ specific objectives, preoccupations, and aesthetics differ? Are women looking at women projecting less stereotypical images? Are male directors more sympathetic to the woman’s plight today? Can a woman director be just “one of the boys?” Selected Latin American and chicano films. GER:3a (DR:7)
3-5 units, Aut (Haro)

199. Individual Work—Open only to students in the department, or by consent of professor. (Spanish and Portuguese)
1-12 units (Staff)

ADVANCED UNDERGRADUATES AND GRADUATES

LANGUAGE, LINGUISTICS, AND THEORY

203. History of the Spanish Language—The development of the Spanish language from its earliest days to the present. Focus is on the historical circumstances in which the Spanish language took place, and on the phonological, morphological, and syntactic changes that took place during of this development.
3-5 units, Valdés

206. Spanish Use in Chicano Communities—The significance and consequences of language diversity in the culture and society of the U.S. Using Spanish-English Chicano bilingual communities, focuses on the experiences of non-English background individuals in this country.
GER:4b (DR:3)
3-5 units, Spr (Valdés)

PENINSULAR LITERATURE

225E. Theater, Society, and Politics in 20th-Century Spain—The two major 20th-century Spanish dramatists: Ramon del Valle-Inclán and Federico García Lorca. The innovative, avant-garde nature of their major plays (symbolism, expressionism, realism) and the dramatists’ engagement with fundamental social and political issues of the times (feudalism, the newly emerging liberal state, women’s protest, class struggle, civil war). (In English)
3-5 units, Aut (Predmore)

LATIN AMERICAN LITERATURE

216. The Classical Tradition, Political Ideology, and Literature in 20th-Century Latin America—20th-century Latin America exhibited diverse forms of classical tradition, from cesarismo as ideological support of the illustrious tyrant, to the subversion of the classical myths by writers who revised the false images of women. The material provides coherence to a mosaic which, until now, was fragmented.
3-5 units, Spr (Campuzano)

230. Contemporary Fiction in Democratic Spain—Post-Franco Spain (1975-2000) has been marked by a diversity of artistic and literary forms that run parallel to unprecedented political and social freedoms. Under the dominant paradigm of Postmodernism, the last two generations of writers (Javier Marías, Juan José Millás, Antonio Muñoz Molina, Arturo Pérez Reverte, Soledad Puértolas, Montserrat Roig, etc.) have expanded the restrictive boundaries of realist fiction to include populist and self-reflective and antirealist forms. Chronicles, memoirs, metaphorical accounts, documentaries, and film scripts have enriched the novel and contributed to a hybridization of prose genres that mirror the resilient identities of a democratic Spain.
3-5 units (Haro) not given 2000-01
247. Cuba: Forty Years in Poetry and Film—Since 1959, Cuba has developed an important corpus of poetry and film. Focus is on the tensions between individual needs and collective dreams in the works of well known poets (N. Guillen, J. Lezama Lima, Nancy Morejon, R. Fernandez Retamar, E. Diego, C. Vitier, the Nueva Trova, etc.), and on films (Los dias del agua, Memorias del subdesarrollo, Lucia, Fresa y chocolate, and the controversial Mexican-Cuban documentary Quien diablos es Juliette?).
3-5 units, Win (Ruffinelli)

251. Legal Culture and Repression in Continental America—Continental America from Early Modernity (16th century) until today: the legal scholarship, literary studies, history, philosophy, sociology, Spanish/Hispanic studies, and Chican@o/Latin studies. Primary sources: indigenous texts, Spanish Indian law, post-independence legalities from N. and S. America, and literature from the U.S. Supreme Court.
3-5 units, Win (Gomez)

253E. The Modern Imagination and Mexico’s Ancient Books—America as a continent is still discovering evidence of how things were before Europe invaded: the language, art, music, astronomy, medicine, written page. The “codices” or pre-Cortesian books of Mexico constitute a privileged chapter of world literature, complementing a repertoire of inscriptions and sculpture; and offer a direct window on the early culture and civilization of America revealing the ways and philosophies of being, and may serve as guidelines into the future. Together with the corpus of transcriptions in Post-Cortesian and alphabetic texts, the codices today have a political function for native communities in defending culture and territory; and, through the practice of mural painting, express political resistance throughout central Mexico and in the barrios of California. They serve as a creative resource among novelists, poets, artists, film makers, and musicians. Working from direct analysis of the codices, an examination of their original functions and significance, and their impact on modern life. (In English) GER:4a (DR:2)
3-5 units, Aut (Brotherston)

256. One Hundred Years of Moving Images from Latin America—A century of Latin American filmmaking through close watching/reading of ten of the most important films made in the continent, from Chilean “El Húsar de la Muerte” (silent) to Cuban “Strawberry and Chocolate” and Brazilian “Central do Brasil.” Focus is on the creativity of filmmaking and on the different ways these films represent social, political, and subjective realities in Latin America.
3-5 units, Aut (Ruffinelli)

258. International Baroque—Baroque is the international culture of Southern Europe and Latin America and the aesthetics of late or peripheral modernity inside an expanding world-system paradigm. The material contextualizes objects of culture and classic literature on both sides of the Atlantic within a political and economic framework, including a component of art history. Readings: Caldeirón de la Barca, Lope de Vega, Baltasar Gracián, Estebanillo González, Quevedo, Juana Inés de la Cruz. (In Spanish)
3-5 units, Spr (Gomez)

269. Borges—Short stories, poetry, and essays by the Argentinean Borges. His works as literature and as a paradigm for the subsequent generation, utilizing film adaptations of the short stories to make comparisons between two different aesthetic expressions.
3-5 units, Win (Ruffinelli)

272. Black Literature in Brazil—Afro-Brazilian fiction and poetry. Focus is on 19th- and 20th-century writers, from the abolitionist Luiz Gama, to Machado de Assis, Lima Barreto, and contemporaries like Luiz Cun, Marilene Felinto, Alberto Musa, and Edmilson Pereira. (In English or Portuguese, depending on students’ fluency.)
3-5 units, Win (Sad)

298. Senior Seminar: Pan-American Movements—Recommended for students working on honors theses. At various moments in the history of Latin America, intellectuals have proposed the goal of continental unity. How does the Pan-American ideal relate to the project of nation-building? Survey of Pan-American visions ranging from 19th- and early 20th-century leaders and intellectuals (Bolívar, Bello, Martí, and Vasconcelos) to contemporary figures (García Márquez, Galeano, Castillo, Saldivar). GER:4a (DR:2) (WIM)
3-5 units, Win (Fox)

CHICANO STUDIES

299. Individual Work—Open to department undergraduates or graduates by consent of professor. May be repeated for credit. (In Spanish and Portuguese)
1-12 units, any quarter (Staff)

GRADUATE SEMINARS

Open to undergraduates with consent of instructor.

307E. Latin American Cultural Theory: A Historical Perspective—How has Latin America defined itself over time? How have its intellectual dealt with questions related to race, class, and culture? Examples from different regions and moments of the Latin American experience offer some answers, using concepts developed in the field of “Cultural Studies” with a more diachronic approach. Readings: the foundational statements by Andres Bello, Jose de Alencar, and Jose Marti; the racial theories of Gilberto Freyre; Oswald de Andrade’s “Manifesto Antropofago;” Carpenter’s definition of “lo real maravilloso;” texts by Ernesto Che Guevara; Augusto Boal’s Teatro do Oprimido; Roberto Fernandez Retamar’s Caliban; Angel Rama’s Transculturacion narrativa en America Latina; and articles by Antonio Candido, Roberto Schwartz, Marileen Chau, Jesus Martin Barbero, Nelly Richard, Beatriz Sarlo, etc. (In English)
3-5 units, Aut (Sad)

309. Language Teaching Practicum—Based on the new departmental Spanish language learning objectives, develops the graduate teaching assistants’ ability to teach in the department, helping them expand their range of teaching strategies. Participants focus on translating the department’s objectives for first-year Spanish into activities and exercises for their classes. Issues of classroom management, materials design, and measurement. Active participation is required for all teachers of first-year Spanish.
1 unit, Aut, Win, Spr (Valdez, Angelleli)

310E. Life in the Megalopolis: Mexico City and São Paulo—Cultural responses to life in two of the world’s largest cities. Socio-anthropological texts, poetry and fiction, film and video, popular music, and visual arts. (In English)
3-5 units, Win (Sad)

313. The Colonial Condition—Pre-19th century Latin America and the Iberian peninsula. What are the intersections and limitations between historicity and textuality? The Maya and Aztec worlds, the historical relationship between law and literature, visual and non-visual communication, subaltern knowledge, and gender differences. Texts: the Popol Vuh, the Codex Mendoza, Solórzano y Pereira, Vasco de Queiroga, Felipe Guzmán Poma de Ayala, Madre Castillo, Bernardo de Balbuena, Cervantes de Salazar, Diego de Valadés.
3-5 units, Spr (Gomez)

327. Literary and Cultural Theories—A study, through representative texts of contemporary literary and cultural theory, of the major issues and problems within the field of literary studies today. Two major methodological themes: the idea of truth and the relationship between history, literature, and narration. Different approaches to theory and criticism within the philosophical, anthropological, postmodern, Marxism, feminist, and cultural debates.
3-5 units, Aut (Rios)
328. Nation(s) and Citizenship(s): Modernity, Postmodernity, and Globalization—Benedict Anderson’s *Imagined Communities* opened a debate about three major issues: the building up of the notions of nation and citizenship, the place of the New World in the nationalistic polemics, and the role of press and capitalism in shaping the Occidental National States. Using this book as a point of departure, reviews the most important ideas around these issues going beyond Modernity, the frame where Anderson’s debate is located. The different Latin American texts (national romances, chronicles, and essays) where students can put into practice the theoretical tools discussed.

3-5 units, Aut (Rios)

336E. Major Trends in Spanish Poetry: Machado, Jiménez, Lorca—Trends and developments in 20th-century poetry in the context of Restoration Spain (1871-1930), and against the background of the democratic tradition of Spanish liberalism. Emphasis is on close stylistic analysis and such concepts as the Generation of 1898, Modernism, Krausism, pure poetry, and symbolic systems.

3-5 units, Win (Predmore)

344E. Decolonizing the Middle Ages—Colonialism occurs across space and time. Europe’s imperialist expansion into Africa and the “New World” was accompanied by a mastering and subjugation of Europe’s own history, creating a colonized past it calls, rather unconsciously, “The Middle Ages.” Many of the same discursive categories used to describe the inhabitants of subjugated continents are used to describe this Middle Age: primitive, brutish, violent, uncivilized, backward, dark. Temporal colonization through texts by Dante, Petrarch, Columbus (Libro de profecías), and other historiographical and prophetic texts to help understand and critique the role of a colonialized Middle Age within the larger European colonial project.

3-5 units, Spr (Deagenais)

369. The U.S.-Mexico Border Region—Interdisciplinary seminar, emphasizing recent scholarship in the field of border studies. Topics: the maquiladora industry, cross-border organizing, mass media in the border region, free trade, immigration; and critical theory, arts, and literature about border identities. (Readings in Spanish and English)

3-5 units, Win (Fox)

370. Narratives of Women and Crisis in 1990s Cuba—In comparison to other Latin American literature, that of Cuban women is characterized in the 70s and 80s by the presence of an abundant amount of narratives. In the 90s, when the country experienced a drastic economic crisis which resounded in all spheres of life, it created a mini-boom of female narratives of change and resistance. Texts and their relationship to the most recent history of Cuba.

3-5 units, Spr (Campusano)

380E. Critical Concepts in Chicana/o Literature—Metacritical interrogation of received notions about Chicana/o creativity, and how its canon and genealogies have been constructed and reconstructed over time. “Foundational” texts (*With a Pistol in His Hand, Y No se lo Tрагó la Tierra*), and cultural nationalist/neocolonialist manifestos. Poetry and theater have been formulated as configuring genealogies that were later disrupted by Chicana feminist/lesbian critiques and writings. This literary history is questioned by highlighting women’s essential participation from the beginning in theorizing and writing (which co-existed with sexism), by examining alternative subjects and genealogies, and by studying recently published early women-authored novels.

3-5 units, Spr (Campusano)

399. Individual Work—Exclusively for Spanish and Portuguese departmental graduate students engaged in special work, by consent of professor.

1-12 units, any quarter (Staff)
The department's goals are to acquaint students with the role played in science and technology by probabilistic and statistical ideas and methods, to provide instruction in the theory and application of techniques that have been found to be commonly useful, and to train research workers in probability and statistics. There are courses for general students as well as those who plan careers in statistics in business, government, industry, and teaching.

The requirements for a degree in statistics are flexible, depending on the needs and interests of the students. Some students may be interested in the theory of statistics and/or probability, whereas others may wish to apply statistical and probabilistic methods to a substantive area. The department has long recognized the relation of statistical theory to applications. It has fostered this by encouraging a liaison with other departments in the form of joint and courtesy faculty appointments: Economics (Anderson), Education (Olkin, Rogosa), Electrical Engineering (Cover), Geological and Environmental Sciences (Switzer), Genetics (Risch), Health Research and Policy (Brown, Efron, Hastie, Johnstone, Moses, Olshen, Tibshirani), Mathematics (Dembo, Diaconis), and the Stanford Linear Accelerator (Friedman). The research activities of the department reflect an interest in both applied and theoretical statistics, and probability. There are workshops in biology-medicine and in environmental factors in health.

In addition to courses for statistics majors, the department offers a number of service courses designed for students in other departments. These tend to emphasize the application of statistical techniques rather than their theoretical development.

The Department of Statistics is well equipped for statistical applications and research in computational statistics. Computer facilities include SGI Challenge networked to approximately 25 X-terminals and a PC lab for general research and teaching use. The Mathematical Sciences Library serves the department jointly with the departments of Mathematics and Computer Science.

The department has always drawn visitors from other countries and universities. As a consequence, there is usually a wide range of seminars offered by both the visitors and our own faculty.

**UNDERGRADUATE PROGRAMS**

**MAJOR**

Students wishing to build a concentration in probability and statistics are encouraged to consider declaring a major in Mathematical and Computational Sciences. This interdisciplinary program is administered in the Department of Statistics (Bradley Efron, chair) and provides a core training in computing, mathematics, operations research, and statistics, with opportunities for further elective work and specialization. See the "Mathematical and Computational Science" section of this bulletin.

**MINORS**

The undergraduate minor in Statistics is designed to complement major degree programs primarily in the social and natural sciences. Students with an undergraduate Statistics minor should find broadened possibilities for employment. Furthermore, the Statistics minor provides valued preparation for professional degree studies in postgraduate academic programs.

The minor consists of a minimum of six courses with a total of at least 20 units. There are two required courses (8 units) and four qualifying or elective courses (12 or more units). An overall 2.75 grade point average (GPA) is required for courses fulfilling the minor.

1. Qualifying Courses: at most two of the following courses may be counted toward the six course requirement for the minor: Mathematics 52; Statistics 90/190, 110.
2. Required Courses: Statistics 116 and 200 (or 201). It is recommended that both 200 and 201 be taken, but only one is required.
3. Elective Courses: at least one of the elective courses should be a Statistics 200-level course. The remaining two elective courses may also be 200-level courses. Alternatively, one or two elective courses may be approved courses in other departments. Special topics courses and seminars for undergraduates are offered from time to time by the department and these may be counted toward the course requirement.

Examples of elective course sequences are:

Statistics 202, 203 (204), emphasizing data analysis and applied statistics
Statistics 205, 206 (207), emphasizing statistical methodology
Statistics 206; Economics 160 (181), emphasizing economic optimization
Statistics 206; Psychology 156 (160), emphasizing psychology modeling and experiments
Statistics 207; Electrical Engineering 264 (279), emphasizing signal processing
Statistics 217; Biological Sciences 242 (283), emphasizing genetic and ecological modeling
Statistics 217, 218 (251), emphasizing probability and its applications

**GRADUATE PROGRAMS**

**MASTER OF SCIENCE**

The department requires that the student take 40 units of work from offerings in the Department of Statistics or from authorized courses in other departments. If Ph.D. level statistics courses are included in the program, the total number of units may be reduced. Ordinarily, four or five quarters are needed to complete all requirements.

Each student should fulfill the following requirements for the M.S. degree:

1. Qualifying Courses: at most two of the following courses may be waived by the adviser, in which case they must be replaced by other graduate courses offered by the department.
2. One of Mathematics 103, 113, 115, 171; and one of Computer Science 106X (3 units), 137 (3 units), 138A. Substitution of other courses in mathematics and computer science may be made with consent of the adviser.
3. At least three additional courses from graduate offerings in the department (202-399). Consent of the adviser is required in order to take more than 6 units of Statistics 260, 390, or 399.
4. Additional units to complete the requirements may be chosen from the list available from the department. Other graduate courses (200 or above) may be authorized by the adviser if they provide skills relevant to statistics or deal primarily with an application of statistics or probability and do not overlap courses in the student's program. There is sufficient flexibility to accommodate students with interests in applications to business, computing, economics, engineering, health, operations research, and social sciences.

Students with a strong mathematical background who may wish to go on to a Ph.D. in Statistics should consider applying directly to the Ph.D. program.

All statistics courses required for the M.S. degree (116, 200, 201, 217, and three additional statistics graduate courses) must be taken for letter grades, and an overall 2.75 grade point average (GPA) is required.
DOCTOR OF PHILOSOPHY

The department looks for motivated students who want to prepare for research careers in statistics or probability, either applied or theoretical. Advanced undergraduate or master’s level work in mathematics and statistics provides a good background for the doctoral program. Quantitatively oriented students with degrees in other scientific fields are also considered for admission. The program normally takes four years.

Program Summary—Statistics 300A,B,C, 305, 306A,B, and 310A,B,C (first-year core program); pass two of three parts of the qualifying examination (beginning of second year); breadth requirement (second or third year); University oral examination (end of third year or beginning of fourth year); dissertation (fourth year).

In addition, students are required to take 9 units of advanced topics courses offered by the department (courses numbered above 310, not including literature, research, or consulting), and 3 units of statistical consulting.

First-Year Core Courses—Statistics 300 systematically surveys the ideas of estimation and of hypothesis testing for parametric and nonparametric models involving small and large samples. 305 is concerned with linear regression and the analysis of variance. 306 surveys a large number of modeling techniques, related to but going beyond the linear models of 305. 310 is a measure-theoretic probability theory, beginning with the basic concepts of analysis.

Qualifying Examinations—These are intended to test the student’s level of knowledge when the first-year program, common to all students, has been completed. There are separate examinations in the three core subjects of statistical methods, mathematical statistics, and probability theory, and all are given at the beginning of the Autumn Quarter of the student’s second year. Students may take two or three of these examinations and are expected to show acceptable performance in two examinations.

Breadth Requirement—In order to appreciate scientific problems, students are required to take 9 units of course work at a graduate or advanced undergraduate level in some other department. These units must be in courses higher than 200. Students with a graduate degree in a scientific area that is not essentially mathematics or statistics are exempted from this requirement.

University Oral Examination—The University oral examination is taken on the recommendation of the student’s research adviser after the thesis problem has been well defined and some research progress has been made. Usually, this happens early in the student’s fourth year. The oral examination consists of a 40-minute presentation on the thesis topic, followed by two question periods. The first relates directly to the student’s presentation and the second is intended to explore the student’s familiarity with broader statistical topics related to the thesis research.

Financial Support—Students accepted to the Ph.D. program are offered financial support. All tuition expenses are paid and there is a fixed monthly stipend determined to be sufficient to pay living expenses. Financial support is continued for four years, department resources permitting, for students in good standing. The resources for student financial support derive from funds made available for student teaching and research assistantships. Students receive both a teaching and research assignment each quarter which, together, do not exceed 20 hours. Students are strongly encouraged to apply for outside scholarships, fellowships, and other forms of financial support.

Ph.D. MINOR

The Department of Statistics will devise individual Ph.D. minor programs, but the department urges all graduate students in other fields who wish to have a subspecialty in statistics to study for an M.S. degree instead. The unit requirement for an M.S. degree is 40 units, whereas the number of units required for a minor averages around 30. This difference of 10-12 units can be made up by the student by including in the M.S. program courses from his or her own field which are related to statistics or applications of statistics.

COURSES

INTRODUCTORY

Introductory courses for general students with an interest in the problems of descriptive statistics and statistical inferences are Statistics 30, 40N, 50N, 60, 61. These courses have no mathematical prerequisites. Statistics 30, 40N, 41N, 42N, 43N, and 50N are Stanford Introductory Seminars offering introductions to particular topics in a small group format with a preference to freshmen. The sequence 60, 61 emphasizes mainly the techniques and methods of statistical inference.

Statistics 90/190, 110, 116, 200, 217-218 are introductory but have a calculus prerequisite. Statistics 110 (which builds on 116) covers the most important techniques used in the analysis of experimental data in engineering and science. Statistics 90/190 is a post-calculus course in statistics specifically designed for economists, psychologists, sociologists, and other social science majors. Statistics 116 provides a general introduction to the theory of probability. It may be followed by 200, which deals with statistical theory, or by 217 and 218, which deal with stochastic processes. The sequence 116, 200 is a basic two-quarter sequence in mathematical statistics; the sequence 116, 217, 218 is a basic one-year course in probability theory.

30. Statistical Thinking—Overview of statistical inference, presented with a minimum of mathematical formulation. Topics: comparisons and the randomized clinical trial, statistical significance, accuracy and the meaning of statistical error ("plus or minus"); correlation and regression to the mean, exploratory methods and data mining, life tables and survival analysis, and learning from experience (Bayesian inference). Lectures are supplemented with web-based statistical simulations. GER:2c (DR:4)

3 units, Win (Efron, Holmes)

40N. Stanford Introductory Seminar: Chance, Experiments, and Interface—Preference to freshmen. The role of probability and statistics in understanding chance phenomena in an uncertain and unpredictable world. Goal: expose students to the range of real-world applications of probability and statistics, to read newspaper and journal articles with critical thinking, and to learn some simple “back of the envelope” calculations to interpret data. Applications: statistics in court cases, randomized clinical trials and assessing the efficacy of new drugs; chance and strategy in sports; paradoxes in probability and statistics; predicting the stock market and the random walk hypothesis; analysis of ESP experiments.

3 units, not given 2000-01

41N. Stanford Introductory Seminar: News and Numbers—Interpreting Information—Preference to freshmen. Data reporting in newspaper and magazine accounts often leads to misinterpretations and erroneous conclusions. Goal: introduce the basic statistical tools needed to critically interpret reported data. Applications from medicine, law, sports, parapsychology, business, etc. GER:2c (DR:4)

3 units, Win (Olkin)

42N. Stanford Introductory Seminar: Monte Carlo Methods—From Molecular Structure to Dynamic Systems—Preference to freshmen. Computer simulation techniques, (Monte Carlo methods), appeared early (1945-55) in electronic computing. The technique (named after the gambling resort) incorporates the element of chance. Statistical physicists introduced the Markov Chain-based, dynamic Monte Carlo method for the simulation of simple fluids and, later, complex physical systems. 1980s statisticians and computer scientists developed the method for varieties of Bayesian computation tasks (e.g., hierarchical modeling, forecasting, and belief network computation). In the '90s, the method played a role in computational biology and was used to solve problems in sequence motif identification and the analysis of complex pedigrees. Application areas of Monte Carlo methods include biology, chemistry, computer science, economics and finance, engineering, material science,
physics, and statistics. The basic principle of the Monte Carlo simulation method and the power of the method; applications from polymer simulations to target tracking.

3 units, not given 2000-01

43N. Stanford Introductory Seminar: Data Analysis and Flow Cytometry—Preference to freshmen. Hands-on research at a flow cytometer in the Medical School. Flow cytometry is a technology for analyzing and sorting cells that is based on laser-induced fluorescence. The technique has become prevalent in the clinical setting and for research, and is an excellent medium to explore important statistical tools used in data analysis.

3 units, not given 2000-01

44N. Stanford Introductory Seminar: The Pleasures of Counting—Preference to freshmen; preference to students with either AP calculus or AP statistics, or equivalent. The interplay between (applied) mathematics and the world around it through a tour of celebrated topics in statistics and mathematics, e.g., John Snow, graphic display and cholera; sorting algorithms; the census, random matrices, etc. Computational experimentation, e.g., MATLAB, is encouraged. GER:2c (DR:4)

3 units, Aut (Johnstone)

50N. Stanford Introductory Seminar: Mathematics in Sports—Preference to freshmen. The mathematical and physical foundations of various sports are developed to provide new statistics, interpret old statistics, and suggest new physical and strategic approaches. Extremes are examined to find the optimum. Some game theory and assessment of odds. The extent to which all sports are equally exciting. Skill vs. luck. The mathematics are followed as necessary to reach the desired conclusions. Recommended: mathematical aptitude.

3 units, not given 2000-01

60. Introduction to Statistical Methods: Precalculus—(Graduate students register for 160; same as Psychology 10.) Emphasis is on techniques for organizing data, computing, and interpreting measures of central tendency, variability, and association. Estimation, confidence intervals, tests of hypotheses, t-tests, correlation, and regression. Possible topics: analysis of variance and chi-square tests, computer statistical packages. GER:2c (DR:4)

5 units, Aut (Holmes)
Win (Staff)
Spr (Walther)

61. Introduction to Statistical Methods II—(Graduate students register for 161.) Regression and curve fitting. Analysis of variance. Statistical principles of experimental design. Categorical data and chi-square tests. Nonparametric methods and the bootstrap. Prerequisite: 60 or consent of instructor.

3 units, Win (Lai)

90. Introduction to Statistical Methods for Social Sciences (Post Calculus)—(Graduate students register for 190.) Graphical and mathematical descriptions of data, exploring relationships in data using correlation and classification, designing experiments and surveys for data collection, probability and sampling, statistical inference based on linear regression models; prediction for regression models. Prerequisite: Mathematics 52 or equivalent. GER:2c (DR:4)

3-5 units, Aut (Switzer)
Spr (Liu)

105Q. Stanford Introductory Seminar: Statistical Design of Experiments in Extrasensory Perception—Preference to sophomores. The principle of good and bad experimental designs and how experimental data is used to reach conclusions. Randomization, experimental control, efficient design, elementary probability, statistical inference, quantification of uncertainty.

3 units, not given 2000-01

110. Statistical Methods in Engineering and the Physical Sciences—Introduction to applied statistics for engineers and physical scientists. Topics: descriptive statistics, interval estimation, tests of hypotheses, nonparametric methods, linear regression, analysis of variance, elementary experimental design. Prerequisites: 116 or equivalent, and one year of calculus. GER:2c (DR:4)

4 units, Aut (Hastie)
Sum (Staff)

116. Theory of Probability—Probability spaces as models for phenomena with statistical regularity. Discrete spaces (binomial, hypergeometric, Poisson). Continuous spaces (normal, exponential) and densities. Random variables, expectation, independence, conditional probability. Introduction to the Laws of Large Numbers and Central Limit Theorem. Prerequisite: Mathematics 52 and some familiarity with infinite series, or equivalent. GER:2c (DR:4)

3-5 units, Aut (Diaconis)
Spr (Donoho)
Sum (Staff)

160. Introduction to Statistical Methods: Precalculus—See 60. For graduate students.

5 units, Aut (Holmes)
Win, Sum (Staff)
Spr (Walther)

161. Introduction to Statistical Methods II—See 61. For graduate students.

3 units, Win (Lai)

190. Introduction to Statistical Methods for Social Scientists (Postcalculus)—For graduate students; see 90.

3-5 units, Aut (Switzer)
Spr (Liu)

199. Independent Study—For undergraduates.
(Staff)


3 units, Win (Holmes)

CONTINUATION
Courses in this category have been designed for particular use in applications. Generally, they have introductory statistics or probability as prerequisites.

201. Statistical Methods—Descriptive statistics, tests of hypotheses, comparison of two samples, the binomial distribution, nonparametric methods, regression correlation, and elements of the analysis of variance. Can be followed by 202 or 203 (or both, in any order). Prerequisite: 116 or equivalent.

3 units, Win (Walther)

202. Data Mining and Analysis—Data mining is used to discover patterns and relationships in data. Emphasis is on large complex data sets such as those in very large data bases or through web mining. Topics: decision trees, neural networks, association rules, clustering, case based methods, and data visualization.

3 units, Spr (Friedman)

203. Introduction to Regression Models and the Analysis of Variance—The most widely used statistical techniques; interpretation of observational data and empirical model building. Topics: simple and multiple linear regression, nonlinear regression, analysis of residuals and model selection, design of one-way and two-way factorial experiments,
fixed effects and random effects models. Prerequisite: 200 or 201.

3 units, not given 2000-01

204. Sampling—The issue in sampling is how best to take data, when you can choose where to sample it. Motivating examples include surveys, and sampling from data warehouses. Emphasis is on methods for finite populations. Topics: simple random sampling, stratified sampling, cluster sampling, ratio and regression estimators, two stage sampling. Computing required. Prerequisite: 61, 110, 200, or 201.

3 units, Spr (Owen)

205. Introduction to Nonparametric Statistics—Nonparametric analogs of the one- and two-sample $t$ tests and analysis of variance; the sign test, median test, Wilcoxon’s tests, and the Kruskal-Wallis and Friedman tests, tests of independence. Nonparametric regression and nonparametric density estimation, modern nonparametric techniques, nonparametric confidence interval estimates.

3 units, not given 2000-01

206. Applied Multivariate Analysis—Introduction to the statistical analysis of several quantitative measurements on each observational unit. Emphasis is on concepts, computer-intensive methods. Examples from economics, education, geology, psychology. Topics: multiple regression, multivariate analysis of variance, principal components, factor analysis, canonical correlations, multidimensional scaling, clustering. Prerequisite: 200 or 201; concurrent registration in 200 is permitted.

3 units, Win (Olkin)

207. Introduction to Time Series Analysis—Time series models used in economics, engineering, physics, geology, etc. Trend fitting, autoregressive schemes, moving average models, periodograms, second order stationary processes, spectral analysis. Prerequisites: 116 and a basic course in statistics (200 or 201A).

3 units, not given 2000-01

208. Introduction to the Bootstrap—The bootstrap is a computer-based method for assigning measures of accuracy to statistical estimates. By substituting computation in place of mathematical formulas, it permits the statistical analysis of complicated estimators. Topics: non-parametric assessment of standard errors, biases, and confidence intervals; related resampling methods including the jackknife, cross-validation, and permutation tests. Theory and applications. Prerequisite: at least one course in statistics or probability.

3 units, not given 2000-01

211. Statistical Methods for Meta-Analysis—(Same as Education 493B, Health Research and Policy 206.) Meta-analysis is a quantitative method for combining results of independent studies, and enables researchers to synthesize the results of related studies so that the combined weight of evidence can be considered and applied. Examples from the medical, behavioral, and social sciences. Topics: literature search, publication and selection bias, statistical methods (contingency tables, cumulative methods, sensitivity analyses, non-parametric methods). Project. Prerequisite: basic sequence in statistics.

3 units, not given 2000-01


3 units, not given 2000-01


3 units, Win (Dembo)

218. Introduction to Stochastic Processes— Renewal theory, Brownian motion, Gaussian processes, second order processes, martingales.

3 units, Spr (Cover)


3 units, not given 2000-01

228. Probabilistic Models in Artificial Intelligence—(Enroll in Computer Science 228.)

3 units, Win (Koller)


3 units, Spr (Lai)

245. Computation and Simulation in Finance—(Enroll in Mathematics 240.)

3 units, Spr (Lee)


3 units, Win (Lai)


3 units, Win (Tibshirani, Betts)


3 units, Spr (Olshen)

298. Industrial Research for Statisticians—Masters-level research as in 299, but must be conducted for an off-campus employer. Final report required. Prerequisite: enrollment in M.S. or Ph.D. program (prior to candidacy).

3 units, Aut, Win, Spr, Sum (Staff)
PRIMARILY FOR DOCTORAL STUDENTS

Sequences 300A,B,C, 305, 306A,B, and 310A,B,C comprise the fundamental sequence which serves as a general introduction to and prerequisite for further work. Subsequent courses delve more deeply into special topics.

260A,B,C Workshop in Biostatistics—(Same as Health Research and Policy 260A,B,C.) Applications of statistical techniques to current problems in medical science. Enrollment for more than 2 units of credit involves extra reading or consulting and requires consent of the instructor.

260A. 1-5 units, Aut (Olshen, Block, Efron, Hastie, Johnstone, Lavori, Lasserzi, Tibshirani)
260B. 1-5 units, Win (Olshen, Block, Efron, Hastie, Johnstone, Lavori, Lasserzi, Tibshirani)
260C. 1-5 units, Spr (Olshen, Block, Efron, Hastie, Johnstone, Lavori, Lasserzi, Tibshirani)

300A,B,C. Theory of Statistics—Elementary finite sample theory of point estimation: statistical models; sufficiency; applications to exponential families, group families, and nonparametric families; minimum risk unbiased estimation; minimum risk equivariant estimation; Cramér-Rao inequality. Elementary decision theory: loss and risk functions, Bayes estimation; minimax estimation; shrinkage estimators. Large sample estimation theory: asymptotic efficiency, maximum likelihood estimation, delta method, asymptotic distribution of quantities and trimmed means, differentiability of statistical functionals robustness and influence. Hypothesis testing and confidence intervals: Neyman-Pearson theory; uniformly most powerful tests and uniformly most accurate confidence intervals for distributions with monotone likelihood ratio; systematic use of sufficiency and conditioning to eliminate nuisance parameters in exponential families; use of invariance to eliminate nuisance parameters in group families; asymptotic theory of likelihood ratio test; Pitman asymptotic efficiency; rank, permutation, and randomization tests; jackknife, bootstrap, and sample reuse methods. Density estimation: kernel density estimation; bias vs. variance tradeoff; choice of bandwidth and kernel. Time series: first- and second-order autoregressive processes; conditions for stationarity; use of maximum likelihood in time series with asymptotic theory. Possible topics: sequential analysis, optimal experimental design, empirical processes with applications to statistics, Edgeworth expansions with applications to statistics.

300A. 3 units, Aut (Seigmund)
300B. 3 units, Win (Romano)
300C. 3 units, Spr (Romano)

305. Linear Models—The linear model: simple linear regression, polynomial regression, multiple regression, anova models; and with some extensions, orthogonal series regression, wavelets, radial basis functions, and MARS. Topics: normal theory inference (tests, confidence intervals, power), related distributions (t, chi-square, F), numerical methods (QR, SVD), model selection/regularization (Cp, AIC, BIC), diagnostics of model inadequacy, and remedies including bootstrap inference, and cross-validation. Emphasis is on problem sets involving substantial computations with data sets, including developing extensions of existing methods. Prerequisite: consent of instructor, 116, 200, one applied statistics course, Computer Science 106A, Mathematics 114.

3 units, Aut (Owen)

306A,B. Methods for Applied Statistics—Survey of applied statistical methods, including computational methods. Topics: nonlinear least squares (including robust regression), generalized linear models, time series (autocorrelation, autoregression, periodogram, spectrum), survey sampling (finite populations, stratification, clustering, ratio estimation), nonparametric regression (kernels, splines, projection pursuit, CART, MARS), survival analysis (Kaplan-Meier, Mantel-Haenszel, Cox model), design (factorial experiments, response surfaces), random number generation, numerical linear algebra, numerical optimization, sample reuse (bootstrap, jackknife, cross-validation, other Monte Carlo), matrix

306A. 3 units, Win (Friedman)
306B. 3 units, Spr (Donoho)

310A. Theory of Probability—Mathematical tools: asymptotics, metric spaces; measure and integration; Lp spaces; some Hilbert spaces theory. Probability: independence, Borel-Cantelli lemmas, almost sure and Lp convergence, weak and strong laws of large numbers. Weak convergence and characteristic functions; central limit theorems; local limit theorems; Poisson convergence. Prerequisites: 116, Mathematics 171.

3 units, Aut (Dembo)


3 units, Win (Siegmund)


3 units, Spr (Lai)

315A,B,C. Modern Applied Statistics: Learning and Data Mining—The meteoric rise in computing power has been accompanied by a rapid growth in the areas of statistical modeling and data analysis. New techniques have emerged that were not possible ten years ago, using ideas that bridge the gap between statistics, computer science, and artificial intelligence. The new methods, emphasizing the statistical methodology.

315A. Learning: Regression—Learning refers to estimating models from data, particularly models for regression and classification. Linear regression models with recent advances to deal with large numbers of variables and model selection. Nonparametric regression methods, smoothing techniques, additive models, projection pursuit, MARS, local regression, and neural networks. Focus is on the regression problem. Modeling, inference techniques, including cross-validation and the bootstrap.

3 units, not given 2000-01

315B. Data Mining—Data mining is used to discover patterns and relationships in data, with an emphasis on large observational data bases. It sits at the common frontiers of statistics, database management, machine learning, and data visualization. From a statistical perspective, it is viewed as computer automated exploratory analysis of (usually) large complex data sets. Topics: classification, association rules, decision trees, covering algorithms, example based methods, clustering, and visualization.

3 units, not given 2000-01


3 units, not given 2000-01

317. Point and Spatial Processes—History via life tables and renewal theory. Poisson processes on the line and general spaces, stationary point processes and the Palm-Kinchin equations. Finite point processes: generating functions and combinatorics. Introduction to random measures,
cluster processes, infinite divisibility, and Cox processes. Spectral theory, Palm theory, applications to eigenvalues of random matrices. 

3 units, Win (Diaconis)

318. Modern Markov Chains—Examples: the Gibbs sampler, metropolis, algorithm and hybrid Monte Carlo. Irreducibility, recurrence periodicity, Doeblins techniques, C-sets, Harris recurrence. Coupling, spectral techniques, bounds on convergence from bounds on the spectrum. Iterated function systems with application to image compression recurrence; Foster’s criteria and applications to statistical decision theory. Introduction to control theory and nonlinear time series analysis. Prerequisite: graduate probability course.

3 units, not given 2000-01

319. Literature of Statistics—Literature study of topics in statistics and probability culminating in oral and written reports.

3 units, Aut (Cover) 
Win (Walther) 
Spr (Romano)


3 units, Aut (Johnstone)

323. Wavelets and Beyond, with Applications—New representations have been proposed for signals and images, e.g., wavelets, wavelet packets, and cosine packets. How these representations are constructed, comparing their special features. The range of potential applications (data compression, feature extraction, pattern classification), and newer representation tools, e.g., noiselets, brushlets, ridgelets, etc.

3 units, not given 2000-01


3 units, not given 2000-01


3 units, Win (Walther)

326. Sequential Experimentation—Sequential statistical decision problems, dynamic programming and optimal stopping, quality control and changepoint detection, dynamic allocation and bandit problems, stochastic approximation, sequential testing and estimation and boundary crossing probabilities.

3 units, Win (Lai)

332. Asymptotic Methods in Statistics—Concepts of efficiency, the asymptotic efficiency of maximum likelihood estimators, best asymptotically normal (BAN) estimators, asymptotic behavior of likelihood ratio tests, optimal designs, empirical Bayes methods.

3 units, not given 2000-01


3 units, not given 2000-01

340. Experimental Design—For graduate students in science, engineering, and statistics. Emphasis is on how and why do experiments, and analyzing and presenting the results. Topics: control groups, anova, blocking and balance, factorial experiments, fractional factorials, screening designs, response surfaces, binary outcomes, Taguchi methods, computer experiments. Prerequisite: 116. Recommended: experience with experimentation or data analysis.

3 units, not given 2000-01


3 units, not given 2000-01

344A. Genetic Epidemiology—(Same as Genetics 344A.) Methods for the design and analysis of studies in human genetics, focusing on the epidemiology of Mendelian disorders and the genetic and environmental contributions to common, complex familial traits. Topics: study designs for assessing the importance of genetic factors (family, twin, and adoption studies); methods for determining modes of inheritance (segregation analysis); identification and mapping of major genes through linkage analysis and disease-marker associations. Applications to birth defects, coronary heart disease, psychiatry, neurology, cancer, and immunology.

3 units (Risch)

344B. Topics in Statistical Genetics—(Same as Genetics 344B.) In-depth discussion of statistical methods currently used in human genetic analysis. Topics depend on interests of the students and instructors: concepts of likelihood as used in the genetic context; measures of familial aggregation, including issues of censoring and age-dependent data; genetic modeling of quantitative traits; mode of inheritance analysis, including segregation analysis; analysis of extended pedigrees; parametric and nonparametric approaches to linkage analysis and gene mapping, including family studies, radiation hybrid data, sperm typing, and DNA contig mapping; linkage disequilibrium; analysis of DNA profiles for individual identification; DNA sequence analysis.

3 units (Risch)

350. Advanced Topics in Probability Theory—Each year concentrates on a different topic(s) of current research in probability theory, chosen to reflect the interests of the students and instructor. Possible topics: Brownian motion, course graining, concentration inequalities, discrete probability, Gibbs measures, interacting particle systems, large deviations, percolation, random matrices, Stein’s method.

3 units, not given 2000-01

352. Spatial Statistics—Statistical descriptions of spatial variability, spatial random functions, grid models, spatial partitions, spatial sampling, linear and nonlinear interpolation and smoothing with error estimation, Bayes methods and pattern simulation from posterior distributions, multi-variate spatial statistics, spatial classification, nonstationary spatial statistics, space-time statistics and estimation of time trends from monitoring data, spatial point patterns, models of attraction and repulsion. Applications to earth and environmental sciences, meteorology, astronomy, remote-sensing, ecology, materials.

3 units, Spr (Switzer)

353. Monte Carlo Methods—Recent advances in iterative and noniterative Monte Carlo sampling methods involved in scientific and statistical computations. Basic iterative methods: the Metropolis-Hastings algorithm and the Gibbs sampler; noniterative methods mainly cover variations of importance and sampling. Topics: molecular dynam-
ics, hybrid Monte Carlo (and other Hamiltonian-based methods), Langevin diffusion, simulated and parallel tempering, adaptive directional sampling, multigrid Monte Carlo and generalized Gibbs sampling, multiple-try Metropolis, conjugate-gradient MC, growth Monte Carlo, and Monte Carlo filtering methods. Applications to Bayesian computations, computational biology, computer chip design, digital signal processing, polymer simulation, statistical physics, and target tracking.

3 units, not given 2000-01


3 units, not given 2000-01

371. Bayesian Modeling and Computations—Bayesian methods treat unknowns as random variables and are coherent and flexible. Basic Bayesian models, whose answers often appear similar to classical answers. Complicated hierarchical and mixture models with nonstandard solutions. Methods for model checking, sensitivity analysis, and predictions. Emphasis is on drawing inferences via computer simulation. Mathematical analysis discussion.

3 units, not given 2000-01

372. Graphical Models and Bayesian Network—Using graphs to represent statistical models (the associational and casual relations between random variables under study) enables concise representations, easy interpretation, and computationally feasible incorporation of new information. Emphasis is on Bayesian inference using these graphical models, e.g., Bayesian networks. Topics: basic graph theory, graphical Gaussian models, log linear models, expert systems, missing data problems, and genetic modeling. Computational issues and their applications to artificial intelligence.

3 units, not given 2000-01

374. Large Deviations—(Same as Mathematics 234.) Combinatorial estimates and the method of types. Large deviation probabilities for partial sums and for empirical distributions, Cramér’s and Sanov’s theorems and their Markov extensions. Application in statistics, information theory, and statistical mechanics. Prerequisite: 310 or Mathematics 230A.

3 units, Aut (Dembo)

376A. Information Theory—(Same as Electrical Engineering 376A.) Information theory and statistics. The extreme points of communication theory: data compression to the entropy limit, and communication at the channel capacity limit, Kolmogorov complexity, Shannon entropy. Rate distortion theory. Huffman coding and random coding. Unified treatment based on the asymptotic equipartition theorem. Prerequisite: 116 or Electrical Engineering 278, or equivalent.

3 units, Win (Cover)

376B. Information Theory—(Enroll in Electrical Engineering 376B.) 3 units, Spr (Cover) alternate years, not given 2000-01

390. Consulting Workshop—Provides the skills required of practicing statistical consultants, exposure to wide range of statistical applications. Students participate as consultants in the department’s drop-in consulting service, analyze clients’ data, and prepare formal written reports. Seminar provides supervised experience in short-term consulting. Prerequisites: course work in applied statistics or data analysis, and consent of the instructor.

3 units, Aut (Owen)

Win (Donoho)

Spr (Liu)

398. Industrial Research for Statisticians—Doctoral research as in 199, but must be conducted for an off-campus employer. Final report required. Prerequisite: Statistics Ph.D. candidate. 1-9 units, Aut, Win, Spr, Sum (Staff)

399. Research—Research work as distinguished from independent study of nonresearch character listed in 199.

(Staff)

PROGRAM IN STRUCTURED LIBERAL EDUCATION

Director and Professor: Mark Mancall (History) Coordinator: Suzanne Greenberg Lecturers: Edith B. Gelles, Suzanne Greenberg, Linda Hess, Patrick Hurt, Christina A. Mesa Visiting Associate Professor: Cornelia E. Mease

The Program in Structured Liberal Education (SLE) is designed specifically for freshmen interested in an interdisciplinary approach to the liberal arts and sciences. The program emphasizes intellectual rigor and individualized contact between faculty and students. SLE has three basic purposes: to present a coherent program of instruction; to develop the student’s ability to ask effective questions of texts, teachers, the culture, and themselves; and to develop intellectual skills in logical reasoning, critical reading, expository writing, and group discussions.

SLE stresses inquiry, criticism, and a tolerance for ambiguity. Neither the faculty nor the curriculum provides “ready-to-serve” answers to the questions being dealt with; rather, SLE encourages a sense of intellectual challenge, student initiative, and originality.

APPLICATION

Freshmen should apply during the summer preceding the academic year in which they will enroll.

SLE is designed as a three-quarter sequence and students applying should be willing to make a commitment for the entire year.

Correspondence regarding the program should be addressed to Program in Structured Liberal Education, Florence Moore Hall, Stanford University, Stanford, California 94305.

COURSES

91, 92, 93. SLE is a demanding program which consumes approximately 60 percent of the average academic workload first-year students usually carry. Autumn Quarter concentrates on ancient Greece, Israel, and India. Winter Quarter examines the religious, ideological, and aesthetic transformations that occurred in Europe, Asia, and the New World as a result of the Middle Ages, Renaissance, Scientific Revolution, and Enlightenment. Spring Quarter focuses on the social, political, and artistic forces that shape the modern world. Completion of the SLE program satisfies the Area One Requirement, the University Writing Requirement, and one General Education Requirement in the humanities.

91. 9 units, Aut (Staff)

92. 9 units, Win (Staff)

93. 9 units, Spr (Staff)

PROGRAM IN SYMBOLIC SYSTEMS

Director: Ivan Sag (Linguistics) Program Coordinator: Todd Davies
The Symbolic Systems Program (SSP) offers an opportunity to focus on issues in computer science, linguistics, philosophy, and psychology, as well as courses designed specifically for the program. The goal is to prepare students with the vocabulary, theoretical background, and technical skills to understand and participate in contemporary interdisciplinary research into questions about language, information, and intelligence, both human and machine. The curriculum offers traditional humanistic approaches to these questions as well as training in contemporary developments in the science and technology of computation.

A degree in Symbolic Systems prepares students for advanced training in the interdisciplinary study of language and information, or for postgraduate study in any of the contributing disciplines. It is also excellent preparation for employment immediately after graduation.

**UNDERGRADUATE PROGRAMS**

**BACHELOR OF SCIENCE**

The program leads to a B.S. in Symbolic Systems. The curriculum provides students with a core of concepts and techniques from computer science, linguistics, logic, philosophy, and cognitive psychology, drawing on faculty and courses from various departments.

Symbolic Systems majors must complete a core of required courses plus a concentration consisting of five additional courses. All major courses are to be taken for letter grades unless an approved course is offered satisfactory/no credit only. The core requirements are:

1. Cognition:
   a) Psychology 40, Introduction to Cognitive Psychology
   b) One Psychology course from: 30, Introduction to Perception; 50, Introduction to Human Neuropsychology; 131, Language and Thought; 132, Language Processing; 141, Cognitive Development
2. Computation and Artificial Intelligence:
   a) Computer Science 103B, Discrete Structures, or Computer Science 103X, Discrete Structures (Accelerated)
   b) Computer Science 106B, Programming Abstractions, or 106X, Programming Methodology and Abstractions
   c) Computer Science 121, Introduction to Artificial Intelligence, or 221 Artificial Intelligence: Principles and Techniques
3. Philosophical Foundations:
   a) Philosophy 80, Mind, Matter, and Meaning
   b) One Philosophy course from: 181, Philosophy of Language; 184, Theory of Knowledge; 186, Philosophy of Mind; 189 Philosophical Applications of Cognitive Science
4. Language:
   a) Linguistics 120, Introduction to Syntax
   b) Linguistics 130A, Introduction to Linguistics Meaning, or 130B, Introduction to Lexical Semantics, or 230A, Introduction to Semantics and Pragmatics
5. Logic:
   a) Philosophy 160A, First Order Logic
   b) Philosophy 160B, Computability and Logic; or Computer Science 154, Introduction to Automata and Complexity Theory
6. Mathematics: one approved course on a mathematical topic other than calculus.
7. Senior Seminar: Symbolic Systems 201 or an approved interdisciplinary seminar.

Students select concentrations from the list below or design others in consultation with their advisers.

**Applied Logic**

Artificial Intelligence

Cognition

Computer Music

Education and Learning

Human-Computer Interaction

Natural Language

Neural Systems

Philosophical Foundations

Rationality

**MINORS**

Students may minor in Symbolic Systems by completing either item '1' or '2' below.

1. One course in each of the specified core areas (please note that several of these courses have prerequisites):
   a) Artificial Intelligence: Computer Science 121 or 221
   b) Computer Science: Comp. Sci. 103B, or 103X
   c) Linguistics: Ling. 120, 130A or 130B
   d) Logic: Philosophy 159 or 160A, or Computer Science 154
   e) Philosophy: Phil. 80, 181, 184, 186, or 189
   f) Psychology: Psych. 30, 40, 50, 131, 132, or 141

2. Symbolic Systems 100, plus an interdisciplinary SSP concentration listed in the program booklet (available from the program office, or on the SSP Web page, http://www-leland.stanford.edu/dept/symbol/). To qualify, the selection of courses used for the minor must be interdisciplinary, that is, it must either include courses from at least three departments, or include more than one course from each of two departments.
DIRECTED RESEARCH, SENIOR HONORS, AND COTERMINAL DEGREES

The program strongly encourages all SSP majors to gain experience in directed research by participating in faculty research or by pursuing independent study. Several avenues are offered.

1. Summer Internships: students work on SSP-related faculty research projects.
2. Independent Study: under faculty supervision, students work on independent projects. For course credit they may enroll in Symbolic Systems 196.
3. Senior Honors: under faculty supervision, students pursue extended research projects and complete a senior honors dissertation.

Contact SSP for more information on any of these options. In addition, the Undergraduate Research Opportunities office on campus offers numerous grants and scholarships supporting student research projects at all levels.

Many SSP majors also complete coterminal M.S. or A.M. degrees in affiliated departments. The Department of Philosophy offers a special Symbolic Systems track for interdisciplinary graduate level work.

COURSES

100. *Introduction to Cognitive Science* —The history, foundations, and accomplishments of the cognitive sciences, including presentations by leading Stanford researchers in artificial intelligence, linguistics, philosophy, and psychology. Overview of the issues addressed in the Symbolic Systems major.
  4 units, Spr (Beaver)

  4 units, Win (Cohen)

145. *Cognition and Computer Use* —How complex cognitive processes (e.g., learning, spatial reasoning, problem solving, and language) inform the design of systems and interfaces for scientific, educational, and commercial applications. Important low level "ergonomic" phenomena, e.g., perception, attention, and motor skills. Student project examines thesis issues in a real world setting of their choosing. Attention to commonly overlooked populations, e.g., the elderly, people with special cognitive needs (e.g., dyslexics), and children. Limited enrollment. Prerequisite: consent of instructor.
  4 units, Win (Shrager)

CORE

30. *Introduction to Perception* —(Enroll in Psychology 30.)
  3 units, Aut (Heeger)

40. *Introduction to Cognitive Psychology* —(Enroll in Psychology 40.)
  4 units, Win (Spieler)

50. *Introduction to Human Neuropsychology* —(Enroll in Psychology 50.)
  4 units, Win (Gabrieli)

80. *Mind, Matter, and Meaning* —(Enroll in Philosophy 80.) (WIM)
  5 units, Win (Lawlor)

103B. *Discrete Structures* —(Enroll in Computer Science 103B.)
  3 units, Win, Spr (Johnson)

103X. *Discrete Structures (Accelerated)* —(Enroll in Computer Science 103X.)
  4 units, Win (Dill, Mitchell)

106B. *Programming Abstractions* —(Enroll in Computer Science 106B.)
  5 units, Aut (Staff)
  Win (Plummer)
  Spr (Zelenski)

106X. *Programming Methodology and Abstractions (Accelerated)* —(Enroll in Computer Science 106X.)
  5 units, Aut (Staff)
  Win (Plummer)
  Spr (Zelenski)

120. *Introduction to Syntax* —(Enroll in Linguistics 120.)
  4 units, Aut (Sag, Sells)

121. *Introduction to Artificial Intelligence* —(Enroll in Computer Science 121.)
  3 units, Win (Manning)

130A. *Introduction to Linguistic Meaning* —(Enroll in Linguistics 130A.)
  4 units (Staff) not given 2000-01

130B. *Introduction to Lexical Semantics* —(Enroll in Linguistics 130B.)
  4 units, Win (Levin)

131. *Language and Thought* —(Enroll in Psychology 131.)
  4 units, Aut (Clark)

132. *Language Processing* —(Enroll in Psychology 132.)
  4 units, Win (Griffin)

141. *Cognitive Development* —(Enroll in Psychology 141.)
  3 units, Spr (Johnson)

154. *Introduction to Automata and Complexity Theory* —(Enroll in Computer Science 154.)
  4 units, Win (Staff)
  Spr (Moźniaki)

160A. *First-Order Logic* —(Enroll in Philosophy 160A.)
  4 units, Win (Mints)

160B. *Computability and Logic* —(Enroll in Philosophy 160B.)
  4 units Spr (Mints)

181. *Philosophy of Language* —(Enroll in Philosophy 181.)
  4 units, Win (Crimmins)

184. *Theory of Knowledge* —(Enroll in Philosophy 184.)
  4 units, Spr (Lawlor)

186. *Philosophy of Mind* —(Enroll in Philosophy 186.)
  4 units, Win (Maguire)

201. *Senior Seminar* —Core seminar for program majors. Integrates themes from core course work with contemporary cross-disciplinary research in learning, computation, and formal systems.
  2 units, Spr (Davies)

221. *Artificial Intelligence: Principles and Techniques* —(Enroll in Computer Science 221.)
  4 units, Aut (Koller)

230A. *Introduction to Semantics and Pragmatics* —(Enroll in Linguistics 230A.)
  4 units, Win (Beaver)
RESEARCH

190. Senior Honors Tutorial—Under the supervision of the honors faculty adviser, students work on their senior honors project.
1-5 units, any quarter (Staff)

191. Senior Honors Seminar—Under the leadership of the Symbolic Systems program coordinator, students meet, discuss, and present their honors project.
2 units, Win, Spr (Davies)

196. Independent Study—Independent work under the supervision of a faculty member.
1-15 units, any quarter (Staff)

AFFILIATED DEPARTMENT OFFERINGS

Listed below are a sample of other courses, some of which can be used as part of the student's concentration (see SSP booklet), or may be of special interest to SSP majors. The list is not exhaustive. Students should consult course listings in the related departments for additional courses and information.

COMMUNICATION

169. Computers and Interfaces: Psychological and Social Issues
5 units, Win (Nass)

172/272. Psychological Processing
5 units (Reeves) not given 2000-01

COMPUTER SCIENCE

99C. Stanford Introductory Seminar: Computers—Fact and Fiction
3 units (Koller) not given 2000-01

99F. Stanford Introductory Seminar: Paradox—Bug or Feature?
3 units, Win (Pratt)

99G. Stanford Introductory Seminar: The Two Cultures—Bridging the Gap
3 units, Aut (Roberts, Saldivar)

99P. Stanford Introductory Seminar: Smart Computers and other Technological Opportunities
3 units (McCarthy) not given 2000-01

147. Introduction to Human-Computer Interaction Design
3-4 units, Aut (Winograd)

148. Introductory Computer Graphics
3 units, Aut (Staff)

193H. Human-Computer Interface Tools
3 units, Aut (Staff)

193L. Programming in LISP
3 units (McCarthy)

201. Computers, Ethics, and Social Responsibility
4 units, Win (Roberts)

224N. Natural Language Processing
3 units, Spr (Manning)

228. Probabilistic Models in Artificial Intelligence
3 units, Win (Koller)

229. Statistical Learning
3 units, Win (Bregler)

247A. Human-Computer Interaction: Interaction Design Studio
3-4 units, Aut, Win, Spr (Staff)

247B. Contextual and Organizational Issues in Human-Computer Interaction
3-4 units, Spr (Hinds)

323. Common Sense Reasoning in Logic
3 units, Aut (McCarty)

377. Topics in Human-Computer Interaction
3-4 units, Aut, Win, Spr

3-4 units, Win (Winograd)

426. Genetic Algorithms and Genetic Programming
3 units, Spr (Koza)

547. Human-Computer Interaction Seminar
1 unit, Aut, Win, Spr (Winograd)

EDUCATION

106. Interactive Media in Education
3-5 units, Sum (Walker)

224. Information Technology in the Classroom
3 units, Win (Walker)

295. Learning and Cognition in Activity
3 units, Spr (Greene)

LINGUISTICS

17Q. Stanford Introductory Seminar: Slips of the Tongue
3 units, Win (Zwicky)

44N. Stanford Introductory Seminar: Living with Two Languages
3 units, Spr (E. Clark)

105. Phonetics
4 units, Win (Reetz)

110. Introduction to Phonetics and Phonology
4 units, Spr (Leben)

124. Introduction to Formal Universal Grammar
4 units, Aut (Bresnan)

138. Introduction to Computational Linguistics
4 units, Aut (Kay)

140. Language Acquisition I
4 units, Aut (E. Clark)

231A. Foundations of English Grammar
4 units, Win (Sag)

237. Natural Language Processing
4 units (Manning)

240. Language Acquisition I
4 units, Aut (E. Clark)

PHILOSOPHY

12N. Stanford Introductory Seminar: Gödel's Theorem, Minds, and Machines
3 units, Aut (Feferman)

14N. Stanford Introductory Seminar: Time and Meaning
3 units, Win (Strevens)
Urban Studies brings together students, faculty, and outside specialists who are concerned with the people and problems of cities. The program stresses two basic themes: developing a critical understanding of how cities evolve, and gaining knowledge of the practical and analytical tools which can help improve the quality of urban life. Urban Studies enables undergraduates to examine urban problems through a number of disciplinary lenses and to address these problems in a practical way.

The Urban Studies major examines the city within the broad context of a liberal arts education. It treats urbanism as an interdisciplinary field and encourages students to inquire critically into both the nature of the urban environment and techniques used to modify that environment.

The major prepares students for a variety of careers and advanced academic pursuits. Graduates from the Program on Urban Studies have established careers in architecture, community service, education, environmental planning, real estate development, urban design, and urban planning. Many have obtained graduate degrees in architecture, urban design, or urban planning from major universities across the country including UC-Berkeley, Harvard, and MIT. A substantial number have opted to take graduate degrees in business, law, and public policy.

Information on graduate programs pursued by Urban Studies alumni is available from the program office. This information also details prerequisites for these graduate programs. More general information on Urban Studies, as well as appropriate graduate programs, is available at http://www.stanford.edu/dept/urbs.

UNDERGRADUATE PROGRAMS

All students majoring in Urban Studies must complete the Urban Studies core. Those who specialize in community organization, urban planning and policy, architecture and urban design, or urban education must complete their majors by meeting the appropriate option requirements. Students who wish to concentrate in a different area (for example, health care) must complete the Urban Studies core and design the remaining units with an academic adviser who is a member of the Academic Council. Note that the option in urban education is available only to students who have been admitted as "coterminal students" in the School of Education.

In all cases, Urban Studies majors must satisfy requirements for an option, and complete a minimum of 70 units (not counting prerequisites). Courses used to satisfy requirements for the major must be taken for a letter grade.

Students interested in declaring Urban Studies as a major should do so through the Registrar's Office using Axess. However, students are required to meet with the program director before declaring Urban Studies as a major.

URBAN STUDIES CORE

Urban Studies majors should take 110, Introduction to Urban Studies, before the end of the Autumn Quarter of their junior year, and they should take Urban Studies 125 in the Spring Quarter of their junior year. Each of the following is required:

Economics 1. Elementary Economics
Urban Studies 110. Introduction to Urban Studies
Urban Studies 125. Urban Studies Communication Workshop

Select one of the following:*
Art and Art Hist. 254. Utopia and Reality in Modern Urban Planning
Urban Studies 120. Building Community

* Students in the Urban Planning Option and the Architecture and Urban Design Option are encouraged to select Art History 254, whereas students in the Community Organization Option and the Urban Education Option are encouraged to select Urban Studies 120. These courses are normally taken in senior year, but juniors who plan to write senior honors theses are encouraged to take either Art History 254 or Urban Studies 120 during junior year.

Select at least one course from each of the following categories:

Social Science Research Methods:
(Students in the Urban Education Option must take Ed. 179X)
Comm. 106. Communications Research Methods
Cult. & Social Anthro. 93. Prefield Research Seminar
Ed. 179X. Urban Youth and their Institutions: Research and Practice

Director: Leonard Ortolano (Professor of Civil and Environmental Engineering, on leave Autumn); Acting Director (Autumn): Luis Fraga (Associate Professor of Political Science)
The Committee on Urban Studies: (Chair) Paul Seaver (Professor, History); Samuel Chiu (Associate Professor, Management Science and Engineering), Greg Dees (Acting Associate Professor, Business), Richard Ford (Professor, Law), Luis Fraga (Associate Professor, Political Science; on leave Autumn), Steven Gerecky (Professor, Geological and Environmental Sciences), Shirley Heath (Professor, English, Linguistics), Milbrey McLaughlin (Professor, Education), Nancy Tuma (Professor, Sociology), Paul Turner (Professor, Art and Art History)
Visiting Associate Professor: Gerald Gast
Lecturers: Jeffrey Baird, John Barton, Nadine Cruz, Katherine Cushing, David Driskell, Radford Hall, Neema Kudva, Antoinette Lauden, David Neuman, David Nieh, Beverly Purrington, Jackie Schmidt-Posner, Frederic Stout, Patti Walters
Consulting Professor: Douglas Webster
Program on Urban Studies

**Statistical Analysis:**
- Econ. 102A/Stat. 190. Introduction to Statistical Methods (Postcalculus) for Social Scientists
- Soc. 181B. Sociological Methods II: Statistics
- Stat. 60. Introduction to Statistical Methods: Precalculus

**Urban Anthropology and Sociology:**
(Students in the Urban Education Option must take Sociology 130 or 149)
- Anthro. Sci. 163. Community-Based Conservation
- Cult. & Social Anthro. 81. Comparative Diasporas: Koreans in Japan and U.S.
- Cult. & Social Anthro. 84. The Multicultural City in Europe
- Cult. & Social Anthro. 89B. Comparative Race and Inequality
- Cult. & Social Anthro. 157C. Cultural Studies of Youth
- Cult. & Social Anthro. 170S. Space, Place, and Culture
- Soc. 118. Social Movements and Collective Action
- Soc. 140. Introduction to Social Stratification

**Urban History:**
- Ed. 201B. Education for Liberation
- Hist. 64. Introduction to Race and Ethnicity in the American Experience
- Hist. 65. Introduction to Comparative Studies in Race and Ethnicity
- Hist. 74S. Sources and Methods Seminar: Filipina/o American Communities in California, 1900-1965
- Hist. 152. American Spaces: An Introduction to Material Culture and the Built Environment
- Hist. 206. Undergraduate Colloquium: The Logic of History
- Hist. 251A.B. Undergraduate Colloquium: Poverty and Homelessness in America
- Hist. 253. Undergraduate Colloquium: Topics in African American History and the Great Migration
- Hist. 257. Undergraduate Colloquium: Immigrants and Racial Minorities in American Cities
- Hist. 269. Undergraduate Colloquium: The African American Community Organizing Tradition
- Hist. 292. Undergraduate Colloquium: Postwar Japan

**Urban Politics:**
- Pol. Sci. 185. Asian Americans in Politics
- Pol. Sci. 186. Urban Politics
- Pol. Sci. 192F. Seminar: Politics of Race and Ethnicity in the United States

Students in the Architecture and Urban Design Option may omit the core requirements for social science research methods and statistical analysis. In that case, those students take additional units from the list of restricted electives listed under the Architecture and Urban Design Option to bring the total number of units in the major to 70.

In addition to the required courses, the program recommends that all Urban Studies students obtain basic quantitative skills by taking Mathematics 19, 20, and 21. This can be done most conveniently during the freshman and sophomore years. Urban Studies students are also encouraged to take at least one course that includes a service-learning component.

All Urban Studies students, particularly those in the Architecture and Urban Design option, are strongly encouraged to spend at least one quarter studying at an overseas studies program. Some Urban Studies core course requirements can often be satisfied at the Stanford Overseas campuses in Berlin, Florence, Oxford, Puebla, and Paris. In addition, the other Stanford programs (Buenos Aires, Kyoto, Moscow, and Santiago) sometimes offer courses that are suitable for meeting Urban Studies core requirements.

**COMMUNITY ORGANIZATION OPTION**

The curriculum for the option in Community Organization provides a deep understanding of the concept of community and its manifestations in the public and private sector. The courses concerned with public service and community organizations provide a foundation for more advanced studies of community conflict resolution and the non-profit sector. Additional courses introduce students to computers, business skills, and aspects of urban planning and design. Students pursuing this option are prepared to enter graduate programs concerned with urban affairs and community service. They are also prepared to work with agencies of local government, and a variety of for-profit and not-for-profit organizations engaged in various aspects of community service and development.

There are no formal prerequisites. Students who may want to pursue a graduate degree in business or city planning are encouraged to take Economics 50, Economic Analysis I. Information on graduate programs suitable for urban studies graduates who wish to pursue advanced studies in community organization is available in the Urban Studies office.

**PREREQUISITE**
- Pol. Sci. 59R. Issues in Public Service*

**REQUIRED TO COMPLETE THE MAJOR**
- Comp. Sci. 105, or a more advanced course in computers
- Public Policy 191. Business Skills for the Social Sector
- Urban. 191A. Introduction to Community Service Organizations
- Urban. 191B. Community Organizing
- Urban. 191C. Community Organizing
- Urban. 192. Social Entrepreneurship

Select two of the following courses in architecture, urban design, or planning:
- Hist. 264S. Undergraduate Research Seminar: The Papers of Martin Luther King, Jr.

**RESTRICTED ELECTIVES**

These elective courses include any from the Urban Studies core; any 100-level course offered by the Program on Urban Studies, and courses listed below. Restricted electives are used to bring the total number of units to 70 (not including prerequisites).

- Ed. 95S. Issues in Leadership
- Ed. 100X. The State of Public Education in Urban Communities
- Ed. 105. American Education and Public Policy
- Ed. 141. Race, Education, and the Media
- Ed. 177X. Education of Immigrants in Cities
- Ed. 193. Peer Counseling
- Geol. & Envr. Sci. 148. Design and Construction of Affordable Housing
- Manag. Sci. & Engr. 184. Transportation Systems and Urban Development
- Pub. Pol. 182A.B. Policy Making and Problem Solving at the Local and Regional Level
- Urban. 177. Architecture and Community Service Design Studio
- Urban. 186. Revitalizing the E-Downtown
- Urban. 187. Community Based Planning

* Pol. Sci. 59R should be taken before or at the same time as Urban. 191C.

**URBAN PLANNING OPTION**

Courses required for the Urban Planning option introduce the techniques and approaches of city planners. A course applying economics to the solution of urban problems is a key element of this option. Students are also required to take courses that center on housing, transportation, urban design, and urban policy making. Because urban planners rely heavily on computers, the major requires an introduction to computer science. The Urban Planning option provides excellent preparation for graduate programs in urban and regional planning and in public policy analysis.

Students interested in these graduate programs are encouraged to consult with the program director and to review information describing graduate programs available in the Urban Studies office.

**PREREQUISITE**
- Econ. 50. Economic Analysis I
- Econ. 50M. Economic Analysis IA or pass math placement exam
- Math. 41, or 19 and 20. Calculus

**REQUIRED TO COMPLETE THE MAJOR**
- Civ. & Envr. Engr. 148. Design and Construction of Affordable Housing
- Geol. and Envr. Sci. 196. Introduction to GIS: ARC/Info and ARC-View
- Soc. 118. Social Movements and Collective Action
- Soc. 145. Race and Ethnic Relations
- Soc. 160. Formal Organizations
- Soc. 266. Organization and Public Policy

**URBAN PLANNING OPTION**

Courses required for the Urban Planning option introduce the techniques and approaches of city planners. A course applying economics to the solution of urban problems is a key element of this option. Students are also required to take courses that center on housing, transportation, urban design, and urban policy making. Because urban planners rely heavily on computers, the major requires an introduction to computer science. The Urban Planning option provides excellent preparation for graduate programs in urban and regional planning and in public policy analysis.

Students interested in these graduate programs are encouraged to consult with the program director and to review information describing graduate programs available in the Urban Studies office.
Select one of the following urban design courses:
- Urbs. 170. Introduction to Urban Design
- Urbs. 183. Land Use Control
- Urbs. 186. Revitalizing the E-Downtown

Select one of the following economics courses:
- Econ. 118. Economics of Development
- Econ. 148. Urban Economics
- Econ. 150. Economics and Public Policy
- Econ. 154. Economics of Legal Rules and Institutions
- Econ. 153. Environmental and Natural Resources Economics

Select one of the following computer courses:
- Art & Art Hist. 173. Digital Narration
- Art & Art Hist. 174. Digital Art in Public Spaces
- Civ. & Envir. Engr. 111. 3D and 4D Modeling of Civil Engineering Projects
- Comp. Sci. 105. Introduction to Computers
- Comp. Sci. 106A. Programming Methodology

RESTRICTED ELECTIVES

These elective courses include any from the Urban Studies core; any 100-level course offered by the Program on Urban Studies, and courses listed below. Restricted electives are used to bring the total number of units to 70 (not including prerequisites).

- Civ. & Envir. Engr. 111. 3D and 4D Modeling of Civil Engineering Projects
- Comp. Sci. 111. Introduction to Computers
- Comp. Sci. 106A. Programming Methodology

ARCHITECTURE AND URBAN DESIGN OPTION

The Architecture and Urban Design option allows the student to explore design in the context of architectural and urban history and in response to human needs, social concerns, and cultural values. Required courses focus on drawing and design and on the history of architecture. Art and History 60 and 160 are sequenced.

- Art Hist. 1. Introduction to the Visual Arts
- Art Hist. 251. Frank Lloyd Wright
- Art Hist. 253. Le Corbusier
- Art Hist. 255. The American College Campus
- Art Hist. 256. The Everyday Landscape: The Ordinary, the Vernacular, and the Extraordinary

PREREQUISITE

Course No. and Subject
Art 60. Basic Design

REQUIRED TO COMPLETE THE MAJOR

Art (Studio) 140. Drawing I, or a more advanced course in drawing
Art (Studio) 160. Design I: Intermediate Design

Select one of the following computer courses.
- Civil and Environmental Engineering 111 and the associated tutorial (111A) are strongly recommended for students considering careers in architecture.
- Art (Studio) 173. Digital Narration
- Art (Studio) 174. Digital Art in Public Space
- Civ. & Envir. Engr. 111. 3D Modeling of Civil Engineering Projects, plus tutorial (CBE 111A)
- Comp. Sci. 105. Introduction to Computers
- Comp. Sci. 106A. Programming Methodology

Select one of the following urban design courses:
- Civ. & Envir. Engr. 148. Design and Construction of Affordable Housing
- Urbs. 170. Introduction to Urban Design
- Urbs. 186. Revitalizing the E-Downtown

Select one of the architecture studio courses listed below. It is recommended that the requirement for a course in urban design be satisfied before taking an architecture studio course.
- Art (Studio) 249. Advanced Undergraduate Seminar
- Urbs. 174. Architectural Design Process
- Urbs. 177. Architecture and Community Service Design Studio

ART HISTORY OPTION

Select one of the following introductory history of art/architecture courses:
- Art Hist. 107. Age of Cathedrals
- Art Hist. 115. Renaissance Architecture, 1420-1580
- Art Hist. 147. The Bauhaus
- Art Hist. 185B. Landscapes, Geographies, and Ideologies: Intercultural Perspectives
- Art Hist. 150A. American Vernacular Architecture
- Art Hist. 174. Baroque Architecture
- Art Hist. 141. The Invention of Modern Architecture
- Art Hist. 142. Varieties of Modern Architecture
- Art Hist. 150C. American Architecture and Urbanism

RESTRICTED ELECTIVES

These elective courses include any from the Urban Studies core; any 100-level course offered by the Program on Urban Studies; any 100-level course offered by the Department of Art and Art History in drawing, painting, sculpture, printmaking or design; or courses listed below. Restricted electives are used to bring the total number of units to 70 (not including prerequisites).

- Art Hist. 140. Theories of Architecture
- Art Hist. 236. The Everyday Landscape: The Ordinary, the Vernacular, and the Extraordinary
- Art Hist. 253. Le Corbusier
- Art Hist. 255. The American College Campus
- Art Hist. 251. Frank Lloyd Wright

RECOMMENDED ADDITIONAL STUDY

Architecture graduate schools typically require applicants to submit a portfolio of work in the visual arts or design as part of the admissions process. The Urban Studies Student Handbook contains information on portfolio preparation, and the Urban Studies library contains samples of portfolios from alumni who have successfully gained entrance to graduate programs in architecture and urban design. In addition, many graduate schools of architecture require calculus, physics, and basic computer skills as conditions for admission.

Students seeking exposure to orthographic projection and other aspects of technical drawing should take Mechanical Engineering 103D, Engineering Drawing. Students interested in graduate programs in architecture are encouraged to consult with the program director and to review information describing graduate programs available in the Urban Studies office. Courses in drafting are available at local community colleges including West Valley College and Foothill College.

URBAN EDUCATION OPTION

The curriculum in urban education is intended only for students who have been admitted to the Stanford Coterminal Teaching Program leading to an A.B. degree in the School of Education. In addition to receiving a B.A. and an A.M., students who complete the Stanford Coterminal Teaching Program receive a middle school/high school teaching credential from the State of California. Application and admission to the coterminal program is done entirely through the School of Education.
additional information, contact the staff of the Stanford Teacher Education Program (STEP). Application and admission to the Coterminal Teaching Program takes place during either the Spring Quarter of the sophomore year or the Autumn Quarter of the junior year.

Completion of the Urban Studies major requires that students take the courses indicated below in addition to all courses in the Urban Studies core. Many of the courses in the option are required to obtain a credential for teaching social studies in the State of California.

Ed. 101. Undergraduate Practicum/Colloquium in Teaching
Hist. 165A, B, C. United States History from the Revolution to the Present
Pol. Sci. 10. American National Government
Pol. Sci. 20. Comparing Political Systems
Psych. 1. Introduction to Psychology
Psych. 60. Introduction to Developmental Hum. Bio.
or Psychology 126. Adolescent Development

In addition to the history courses listed above, State of California credentialing guidelines require that one course be taken in each of the following sub-fields:

Ancient History
Medieval history
Modern Asian, African, or Latin American History
Modern European History

Students may use all of the history courses above toward a minor in history. For complete details on which history courses qualify for the Coterminal Teaching Program curriculum, contact Frederic Stout, Lecturer in the Program on Urban Studies and coordinator of the Coterminal Teaching Program; for details about the minor, contact the Department of History.

SELF-DESIGNED OPTION

Students who wish to concentrate in an area other than Community Organization, Urban Education, Urban Planning, or Architecture and Urban Design must complete the Urban Studies core and design the remaining units (to bring the total to 70 units) with an academic adviser who is a member of the Academic Council. The self-designed portion of the major should concentrate on a particular area of analysis such as health care, or environmental management.

Proposals should include only courses at the 100 level or above and must be approved by a subcommittee of the Committee on Urban Studies. Proposals for the self-designed portion of the major should include a course list and a description of how the courses meet the student’s educational objectives. The proposal must be accompanied by a letter from the student’s academic adviser indicating that he or she has examined the final version of the proposal and finds it acceptable.

Students pursuing a self-designed option must submit proposals for approval by the Urban Studies Committee by the middle of the second quarter of the student’s junior year. Applications received after that deadline are not considered. Students interested in designing their own option are strongly encouraged to meet with the program director before the end of the first quarter of their junior year.

MINORS

The minor in Urban Studies is designed to accomplish two things. First, it introduces students to how specialists from each of several different disciplines approach the study of cities. Second, it provides students with an opportunity to explore their interests in one of three specialized fields: (1) Architecture and Urban Design, (2) Urban Planning, or (3) Community Organization. Students must declare the minor no later than the last day of the quarter four quarters before degree conferral.

Requirements—Students must complete seven courses (for a letter grade) including Urbs 110, Introduction to Urban Studies.

Three courses must be completed from the following categories as listed above in the Urban Studies core: Urban History, and Urban Anthropology and Sociology. At least one course must be from each category.

All three courses in one of the following groups must be completed:

1. Architecture and Urban Design

2. Urban Planning
   b) Manag. Sci. & Engr. 196. Transportation Systems and Urban Development
   c) One course from those included in the Urban Studies Core course listings above for Urban Politics, or one of the courses listed as meeting the “economics course” requirement for Urban Studies majors in the Urban Planning Option.

3. Community Organization
   b) Urbs. 191C. Community Organizing (requires Urban Studies 191B as prerequisite)
   c) Urbs. 192. Social Entrepreneurship

HONORS PROGRAM

The honors program offers qualified students an opportunity to conduct independent research and to write a thesis summarizing the results. The program grants honors at graduation to those students who have successfully completed a thesis of honors quality, attained a 3.5 grade point average (GPA) in their major, and successfully completed all course requirements. Honors students must register for a minimum of 7 units and a maximum of 15 units of Urban Studies 199 spread over their senior year, and they must complete Urban Studies 200. The program encourages students writing theses linked to community service to apply to the Public Service Scholars Program administered by the Haas Center for Public Service and to register in Urban Studies 198 concurrently with 199. Students can obtain details regarding honors procedures from the Urban Studies Program office.

COTERMINAL PROGRAMS

Undergraduates in Urban Studies may enter coterminal master’s degree programs in a number of departments in the University. In recent years, Urban Studies majors have developed coterminal programs within the departments of Cultural and Social Anthropology, Sociology, and the School of Education. As noted, a special coterminal program with the School of Education exists for students in the Urban Education option, but other coterminal programs can also be arranged through the School of Education. Information and applications for the coterminal degree programs are available at the Undergraduate Advising Office. Students should discuss the coterminal program with the program director during their junior year.

COURSES

Further descriptions and details of current courses offered by lecturers in the Program on Urban Studies are available prior to each quarter from the program office.

110. Introduction to Urban Studies—Interdisciplinary introduction to the study of cities and urban civilization. The history of urbanization through Lewis Mumford’s The City in History, and the various disciplinarymethodologists comprising the unified field of urban studies (architecture, economics, politics, sociology, urban design, and urban public policy formation).

4 units, Aut (Stout)

120. Building Community—Capstone course for Urban Studies majors in the Community Organization track explores the literature and philosophical underpinnings of community theory developed by urban professionals committed to advocacy, activism, and community service, building on students’ previous experience, including fieldwork placements.

Close reading of classic texts by Louis Wirth, Clarence Perry, Paul Davidoff, Jane Jacobs, Sherry Arnstein, Saul Alinsky, etc. (WIM)

4 units, Win (Stout, Staff)
125. Urban Studies Communication Workshop—Required of all juniors in Urban Studies and used by students to assemble selected items into “portfolios” that contain examples of their best work at Stanford. Preparing portfolio items may involve rewriting previous papers. Other potential portfolio elements include grant proposals and summaries of completed project work. Students in the architecture and urban design option use the workshop to prepare portfolios of their work in design and visual arts, and prepare short essays to introduce their visual work. Students make at least two oral presentations and receive constructive feedback on their work from peers and instructors. Prerequisite: junior year status in Urban Studies or consent of the instructor. 
3-4 units, Win (Hall, Kibbel)

183. Land Use Control—Survey of current and emerging methods of land use control related to the pattern and scale of development and the protection of land and water resources. Emphasis is on the relationship between the geographical landscape, physical externalities, land use law, and desired land use goals. Topics: the historical roots of modern land use controls; urban reforms of the 19th century; private ownership of land; zoning; innovations in local, state, and federal land use control; and regulations and management programs. Current issues of growth management, park and recreation services, transportation, urban housing, wetlands, environmental mediation/conflict management, and special purpose agencies. 
4 units, Spr (Hall)

184. Managing the Urban Environment in East Asia—Focus is on identification of effective actions to address urban environmental issues in rapidly changing Asian regions. Urban systems are analyzed as human habitat, natural resource consumption systems, polluters, and drivers of environmental quality. Innovative options for financing/delivering environmental infrastructure, hardware, and software. Case studies from Bangkok, Shanghai, Seoul, and Jakarta. 
4 units, Win (Webster)

177. Architecture and Community Service Design Studio—The design studio is an actual program, site, and client. The client is a non-profit community service or other charitable organization. Students provide service to a community organization by providing workable design solutions that accommodate needs for the organization’s remodeling and/or expansion. The final product is presented to the client in the form of schematic and design development drawings. Discussions of relevant issues, assistance with architectural design and drawing techniques, site visits, meetings with the clients, and critiques by guest architects. Enrollment limited to 14. 
4 units, Win (Baird, Dissell, Kudva)

182. Urban Environmental Policy—Overview/analysis of urban environmental issues through the study of current policy, organizations, and case examples, with an emphasis on California and the San Francisco Bay area. Guest lectures from experts working directly on urban environmental issues. Prerequisite: 110, or Human Biology 125, or consent of instructor. 
4 units, Win (Hall, Kibbel)
ings, discussions with leaders and staff of community service organizations, and a philanthropic class project resulting in a class recommenda-
tion for a disbursement by a philanthropic public funding agency to a 
community service organization. Small groups select a community 
service organization for a disbursement by a philanthropic public funding agency to a 
community service organization, who provide feedback 
to guests from community service organizations, who provide feedback 
on presentations. Promotes familiarity with existing types of urban-
to guests from community service organizations, who provide feedback 
to guests from community service organizations, who provide feedback 
on presentations. Promotes familiarity with existing types of urban-based 
community service organizations and critical awareness of the 
issues in evaluating their quality and effectiveness.

3 units, Aut (Cruz)

191B. Community Organizing—Prerequisite preparatory work for the 
internship requirement in 191C, including preparation of an internship 
proposal describing learning goals, individual and group meetings on 
internship selection and placement, orientation, placement interviews, 
completion of written learning agreements approved by the internship 
site, and at least 10 hours of beginning internship work during the quarter. Credit is earned contingent on completion of 191C.

1 unit, Aut (Cruz)

191C. Community Organizing—Focus is on community organizing by 
urban-based groups seeking to improve their neighborhoods or groups 
through organizing processes. Guest presenters provide varying per-
sonal perspectives on what community organizing is, who does it, where, how, and with what 
results. Readings provide basic information and historical and theoretical 
background. A required internship provides direct experience with 
organizing processes. Minimum total of 40 hours of internship work 
during the combined Autumn (191B) and Winter (191C) quarters to be 
completed no later than Winter Quarter finals. Corequisite: Political Science 159R.

4 units, Win (Cruz)

191D. Introduction to Community Organizations in Asian Pacific 
Islander (API) Communities—Introduction to the community organi-
zations developed by and for Asian Pacific Islander (API) communities 
in the greater Peninsula/Bay Area. Focus is on organizations attempting 
to improve the conditions of life in the API communities they work with. 
Representatives of API community organizations provide perspectives 
on what they do, who participates in them, where, how, and with what 
results. Readings provide basic information on the API organizations and 
the socio-economic and political contexts in which they arise, struggle, 
and thrive, e.g., the Chinese Progressive Association (Chinatown, SF); 
Asian American Immigrant Women (AIWA in Oakland and San Jose); 
and Asian Pacific Islander Outreach Center, Palo Alto.

1 unit, Spr (Cruz)

192. Social Entrepreneurship—(Same as Public Policy 192.) The 
search for innovative responses to social needs, the role of private 
initiatives, for-profit and not-for-profit, and the challenges associated 
with these initiatives. Theoretical issues: defining the social good and 
assessing the role of market forces, philanthropy, and government. 
Practical issues: recognizing specific opportunities for social improve-
ment, forming an enterprise that responds to those opportunities, devel-
opring organizational and funding strategies, evaluating performance, 
managing the enterprise, and creating sustained positive impact. Read-
ings: business school cases and a range of theoretical and practical 
articles. Prerequisites: Economics 1, junior or senior standing.

5 units, Spr (Dees, Heath)

194. Internship in Urban Studies—For Urban Studies majors only. 
Students organize an internship in an office of a government agency, a 
community organization, or a private firm directly relevant to the major. 
Reading supplements internship. Paper summarizes internship experience and related readings. Prerequisite: Public Policy 179B.

2-4 units (Ortolano)

195. Special Projects

1-5 units (Staff)

197. Directed Reading

1-5 units (Staff)

198. Senior Honors Research in Public Service—Limited to seniors 
who have registered for and have been approved by their departments for 
honors thesis, and who have been admitted to the year-round Public 
Service Scholars Program sponsored by the Haas Center for Public 
Service. If research is to be conducted as a form of public and community 
service, what standards for rigor and excellence would apply in addition 
to those expected by the academy? How can communities benefit from 
research? Seminar introduces the theory and practice of research as a 
form of public service, and provides a forum for discussions and 
presentations of senior honors theses. Readings in research theory and 
methods, methods of participatory action research; quarterly presenta-
tions on research as service; workshops on each participant’s thesis-
work-in-progress; public presentation on completed research; and eval-
uation (by a community-based reader) of the thesis as a form of public/ 
community service. Corequisites: 199A,B,C.

3 units, Aut, Win, Spr (Cruz, Schmidt-Posner)

199. Senior Honors Thesis

1-15 units (Staff)

200. Senior Honors Thesis Seminar—Required for Urban Studies 
writing senior honors theses, and aimed at enhancing the experience of 
writing an honors thesis through presentation, group discussion, and 
basic research skill development. Activities center on presenting “work-
in-progress” to other honors students and receiving constructive feed-
back from students and the instructor; reading selected literature on 
research methods (e.g., research design, and data analysis) and discuss-
ing how the literature relates to the students’ honors theses topics; and 
strategies to deal with getting started on writing and other issues related 
to the writing process. Students apply the general research skills covered 
in social science research methods courses to the students’ specific theses 
topics.

3 units, Win (Cashing)
Academic Programs and Centers

CENTER FOR TEACHING AND LEARNING (CTL)

Director: Michele Marinovich
Senior Associate Director: Robyn Wright Dunbar
Lecturers: Doree Allen, James Milojkovic, James Wagstaffe

Oral Communication Program
Director: Doree Allen

The Center for Teaching and Learning is a University-wide resource on effective teaching and public speaking.

SERVICES TO FACULTY, LECTURERS, AND TEACHING ASSISTANTS

CTL provides the Stanford community with services and resources on effective teaching. Its aims are to: identify and involve successful teachers who are willing to share their talents with others, provide those who are seeking to improve their teaching with the means to do so, acquaint the Stanford community with important innovations and new technologies for teaching, prepare inexperienced teachers for their responsibilities, expand awareness of the role of teaching at research universities, and increase the rewards for superior teaching. CTL also has responsibility for helping teaching assistants (TAs) with their teaching and departments with designing effective TA training programs.

Goals are realized through continuing programs such as: videotaping and consultation; small group evaluation; workshops and lectures; a handbook on teaching and a library of teaching materials; quarterly teaching orientations; and work with individuals, groups, and departments on their specific needs. CTL offices are in Sweet Hall. For further details, see CTL’s teaching handbook or the CTL brochure, both available by calling (650) 723-1326; or consult the Web page at http://www-ctl.Stanford.edu.

ORAL COMMUNICATION PROGRAM

The Oral Communication Program at CTL provides opportunities for undergraduate and graduate students to develop or improve their oral communication skills. Courses and workshops offer a comprehensive approach to speech communication, including training in the fundamental principles of public speaking and the effective delivery of oral presentations. The goal is to enhance the students’ general facility and confidence in oral expression. The program also provides innovative, discipline-based instruction to help students refine their personal speaking styles in small groups and classroom settings.

Those interested in individualized instruction or independent study are invited to visit the program’s Speaking Center in Sweet Hall, where trained student consultants, audio/video technology, and a variety of instructional resource materials are available on an on-going basis. For further details, call (650) 725-4149 or 723-1326, or consult the Web page listed above.

COURSES

117. The Art of Effective Speaking—Introduction to the principles and practice of effective oral communication. Through formal and informal speaking activities, students develop skills framing and articulating ideas through speech. Strategies are presented for speaking extemporaneously, preparing and delivering presentations, formulating persuasive arguments, refining critical clarity of thought, and enhancing general facility and confidence in oral self-expression.

3 units, Aut, Win (Allen)

118. Public Speaking—A practical approach to the art of public speaking. Emphasis is on developing skills in various speech types: exposition, argumentation, and persuasion. Students sharpen their skills with the aid of textbooks, videotapes, texts of famous speeches, and participation in a final program of talks. Students also evaluate presentations by others.

3 units, Sum (Wagstaffe)

119. Teaching Oral Communication—Seminar for students with a strong background in public speaking who wish to train as public speaking consultants for CTL’s Oral Communication Program. Readings, exercises, and supervised teaching refine the students’ speaking skills and prepare them to serve as a peer consultant in a variety of academic disciplines. Admission by consent of instructor.

3 units, Spr (Allen)

219. Oral Communication for Graduate Students—Addresses a range of graduate student speaking activities such as teaching (delivering lectures, guiding discussion, and facilitating small groups), giving professional presentations and conference papers, and preparing for orals or defenses. In-class projects, discussion, and individual evaluation assist students in developing effective techniques for improving oral communication skills.

2 units, Sum (Allen)

CHICANO RESEARCH, STANFORD CENTER FOR

Faculty Executive Committee: Al Camarillo (History, Comparative Studies in Race and Ethnicity), Kenji Hakuta (Education), Jim Leckie (Engineering), Yvonne Maldonado (Medicine)

The Stanford Center for Chicano Research (SCCR) is an affiliated research unit of the Center for Comparative Studies in Race and Ethnicity (CSRE) and one of the founding member institutions of the Inter-University Program for Latino Research (IUPLR). The objective of the SCCR is to facilitate basic and policy-oriented research on the nation’s second largest ethnic minority group, Mexican Americans. As part of the IUPLR consortium, the SCCR also serves as one of the sites to support research projects involving faculty and graduate students and is currently supported through various grants from government agencies.

The participating faculty of SCCR include professors from several departments in the School of Humanities and Sciences, as well as faculty from Business, Education, Engineering, Law, and Medicine. The SCCR was founded in 1980 and remains the only research center of its kind at a major private university.

PROGRAM FOR INDIIVDUALLY DESIGNED MAJORS

Individually Designed Majors (IDM) is coordinated by the Undergraduate Advising Center, located in Sweet Hall, first floor. See also the “School of Earth Sciences” and the “School of Engineering” sections of this bulletin for IDMs in these curriculum areas.

This program is intended for currently registered undergraduates in good academic standing interested in pursuing an area of scholarly inquiry that falls outside the purview of an established academic department or program of the University. Students submit proposals for consideration by the IDM Program Dean’s Advisory Committee. These should be intellectually coherent majors designed by the students themselves, with the assistance of faculty members of their choice. While the
Individually Designed Major (IDM) program is not an honors program, the governing committee encourages each participating student to consider an honors project as a culminating experience of the major. Information about proposal procedures, and the procedure for an honors project, is available at the Undergraduate Advising Center, Sweet Hall, first floor.

In designing a major, the student consults with three faculty members (at least two of whom must be members of the Academic Council) from at least two separate departments or programs of the University; one of the faculty members is selected as the student’s “primary” adviser. In helping the student design the major and in signing the proposal requesting approval from the Dean’s Advisory Committee on Individually Designed Majors, the faculty members are committing themselves to act as a regular academic advisory group for the student until graduation. The committee does not consider proposals without the approval of the faculty advisory group.

DEAN’S ADVISORY COMMITTEE

The program is administered by the Dean’s Advisory Committee on Individually Designed Majors and the Undergraduate Advising Center.

The committee acts in lieu of a regular department of the University. This role involves certifying the scholarly merit of the program and includes the obligation to consider, approve, and recommend changes in each proposed major.

In carrying out its role, the committee reserves the right to reject proposals that in its opinion lack scholarly merit or are not clearly interdisciplinary. Occasionally, the committee must reject a proposal that, though of considerable academic merit, requires resources not available at Stanford. The committee also reserves the right to recommend additions to a student’s faculty advisory group.

THE PROPOSAL

Detailed written procedures and advice about the preparation of the proposal are available from the Undergraduate Advising Center (Sweet Hall, first floor; telephone (650) 723-2426), where an academic adviser is available to discuss your proposal with you.

The proposal should begin with a statement that describes the major, articulates the motivation for and the justification and ultimate goal of the major, and shows how the courses listed relate to and fulfill the major’s goal. This statement should be followed by a list of the proposed core courses to be counted toward the major and, as far as possible, the sequence in which they are to be taken. The proposal must be signed by the selected faculty advisory group; their signatures certify that they endorse the major as described in the proposal and agree to serve as the student’s permanent advisory group. The proposal must be accompanied by a letter of recommendation from each of the three advisers giving separate appraisals of the academic viability of the proposed major. The proposal must also include a current copy of the student’s unofficial transcript.

These specific requirements are in addition to the general guidelines discussed under “The Major” section of this bulletin.

THE GUIDELINES

To establish the IDM program as being fully equivalent to a Stanford A.B. or B.S. degree in an established department or program, the Senate of the Academic Council has approved specific requirements. The criteria for approval of proposals submitted include:

1. Each major shall consist of at least 60 units, all in courses at or above the 100 level (or their equivalent).
2. A maximum of 15 units of these 60 units may be taken on a credit/no credit basis.
3. A maximum of 8 units of these 60 units may be taken in individual study or directed reading.
4. The proposed major must constitute a coherent academic program that fulfills the student’s objectives and achieves a clear academic goal.
5. The proposed major must be comparable in quality and in academic rigor to degrees obtained by students in other degree-granting programs offered at Stanford.
6. The proposed major must achieve both breadth and depth within the academic discipline(s), involve interdisciplinary study, and be compatible with a liberal arts education.
7. The proposed major must not duplicate or be achievable through a major already offered by another degree-granting program or department.
8. Students must present evidence that demonstrates their ability to do independent work.
9. Students proposing individually designed majors must have at least three full quarters of undergraduate work remaining at Stanford after the date on which the proposal is approved by the committee.
10. Two of the three advisers must be on the Academic Council. No more than two advisers may be from the same department.

SOCIAL SCIENCE HISTORY INSTITUTE

The goal of Social Science History Institute is to re-engineer the manner in which students in social science departments learn about historical institutions and data, and the manner in which students in history and related disciplines are trained in social science methods. Historians and social scientists share many of the same substantive interests (the development of economies, political systems, and social structures, for example), but they approach them with different and complimentary methods and bodies of evidence. There is, however, a great deal of potential for historians and social scientists to draw on the strengths of each other’s methods to improve their own work and to foster increased interaction among the various disciplines that employ history as a laboratory to operationalize social science theories. The Social Science History Institute seeks to realize this potential by transplanting state of the art research methods from classics, economics, history, political science, and sociology across the boundaries of each discipline.

An A.B. degree with an emphasis in History and Social Science is offered through the Department of History. The History degree is an HMIE (History Majors with Interdisciplinary Emphasis) program designed to acquaint students with the application of the analytic and quantitative tools of the social sciences to issues in historical causality and explanation. See the “History” section of this bulletin.

Ph.D. MINOR

The first element of the Ph.D. minor in Social Science History is a gateway course, The Logic of History (History 206/306). This course is taught in the Department of History and is designed to introduce students to questions of epistemology and methodology in history and the social sciences. It focuses on standards of evidence and argumentation across the various approaches to history, with a strong emphasis on social science approaches to the discipline.

The second element is a quantitative methods requirement. This requirement may be fulfilled by taking any one of the three two-course sequences:
1. Political Science 200A (Introduction to Political Data Analysis) and Political Science 200B (Statistical Modeling for Political Science)
2. Economics 270 (Intermediate Econometrics I) and Economics 271 (Intermediate Econometrics II)
3. Two of the following three courses in Sociological Methods:
   a) Sociology 382 (Sociological Methodology II: The General Linear Model)
   b) Sociology 383 (Sociological Methodology III: Advanced Models for Discrete Outcomes)
   c) Sociology 384 (Sociological Methodology IV: Advanced Models for Continuous Outcomes)
The third element is a requirement that students focus on a substantive area of social science history. Students must take a group of three courses outside their major department with a strong social science history component. These three courses are selected by students with the advice and approval of a Ph.D. minor adviser, who also must be from outside the student’s major department. The courses should be chosen with an eye toward providing a coherent curriculum in a substantive issue that is useful in the development of a dissertation topic. For example, a student might focus on economic history by taking Problems in American Economic History (Economics 226), European Economic History (Economics 227), and Institutions in Economic History (Economics 228).

The final requirement is a capstone course, History 482 (Historical Social Science). This is a workshop for students working on or planning dissertations on topics related to social science history. Its purpose is to create a venue for the presentation of dissertation chapters or dissertation prospectuses in a multidisciplinary setting, and it is open to all students and faculty in the institute. Students may take this for 1 unit (and for a satisfactory/no credit grade if they so choose), or for 5 units and a grade.

**STANFORD INTRODUCTORY SEMINARS**

*Participating Faculty: Over 200 faculty from more than 60 departments take part in the Introductory Seminars Program. See the faculty listings internal to each department’s listing in this bulletin for pertinent information.*

The Stanford Introductory Seminars Program provides opportunities for first- and second-year students to work closely with faculty as they explore a potential major. These courses aim to intensify the intellectual experience of the freshman and sophomore years by allowing students to work with faculty members in a small-group setting; to introduce students to the variety and richness of the academic topics, methods, and issues which lie at the core of particular disciplines; and to foster a spirit of mentorship between faculty and students. The courses are given department credit and most count towards an eventual major in the field.

Freshmen preference seminars are given for 3-5 units to a maximum of 16 students, and generally meet twice weekly. Although preference for enrollment is given to freshmen, sophomores may participate on a space-available basis with the consent of the instructor. Sophomore preference seminars and dialogues, similarly, give preference to sophomores, but freshmen may participate on a space-available basis and with the consent of the instructor. Sophomore preference seminars are given for 3-5 units to a maximum of 12 students, while sophomore preference dialogues take the form of a directed reading, and are given for 1-2 units to a maximum of four to five students.

All Stanford Introductory Seminars require a brief application. Check the Time Schedule or with the Introductory Seminars office, 3rd Hall 4th Floor, phone (650) 723-4338 for more information. Due dates for applications for the 2000-01 courses are: Autumn Quarter—5 p.m., September 25 for freshmen preference courses, and 5 p.m., September 26 for sophomore preference courses; Winter Quarter—5 p.m., December 8 for both freshmen preference and sophomore preference courses; Spring Quarter—5 p.m., March 16 for both freshmen preference and sophomore preference courses.

**COURSES**

F=preference to freshmen; S=preference to sophomores; Dial=dialogue; Sem=seminar.

**AMERICAN STUDIES**

114Q. Visions of the 1960s—(S,Sem)

5 units, Aut (Gillam)

**ANETHESIA**

75Q. Literature and Medical Interventions—(S,Dial)

1 unit, Aut (Shafer, Barr)

**ANTHROPOLOGICAL SCIENCES**

20N. Modern Human Origins—(F,Sem)

3 units, Spr (Klein)

23N. Maya Mythology Multimedia Project—(F,Sem)

3 units, Win (Fox)

**APPLIED PHYSICS**

79Q. Pros and Cons of Energy Options in the 21st Century—(S,Dial)

2 units, Aut (Geballe)

**ART AND ART HISTORY**

33N. American Art and Culture in the Gilded Age—(F,Sem)

4 units, Win (Matsumoto)

61Q. Comics—A Lively Art—(S,Sem)

4 units, Aut (Bukatman)

**ASIAN LANGUAGES**

71N. Language and Gender in Japan—Myths and Reality—(F,Sem)

3 units, Win (Matsumoto)

**BIOCHEMISTRY**

118Q. Genomics, Bioinformatics, and Medicine—(S,Sem)

3 units, Spr (Brutlag)

**BIOLOGICAL SCIENCES**

11N. Biotechnology in Everyday Life—(F,Sem)

3 units, Aut (Walbot)

13N. Environmental Problems and Solutions—(F,Sem)

3 units, Spr (Ehrlich)

14N. Plants and Civilization—(F,Sem)

3 units, Spr (Mooney)

16N. Island Ecology—(F,Sem)

3 units, Win (Vitousek) alternate years, not given 2000-01

19N. Sex and Gender—An Evolutionary Perspective—(F,Sem)

3 units, Win (Roughgarden)

21N. Readings in Molecular Biology and Genetics—(F,Sem)

3 units, Aut (Baker) alternate years, not given 2001-02

22N. Infection and Immunity—(F,Sem)

3 units, Spr (Jones)

26N. Maintenance of the Genome—(F,Sem)

3 units, Spr (Hanawalt)

29N. The Outer Limits of Life—(F,Sem)

3 units, Spr (Boknan)

37Q. Evolution in Action—(S,Sem)

3 units, Aut (Gordon)

**BUSINESS**

128Q. Upside Potential and Downside Protection—(S,Sem)

3 units, Spr (Sharpe)

**CHEMICAL ENGINEERING**

50Q. Drug Delivery in the 21st Century—(S,Sem)

3 units, Aut (Robertson, Rosen)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Semester</th>
<th>Instructor(s)</th>
</tr>
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<tbody>
<tr>
<td>22N</td>
<td>The Frontiers of Science</td>
<td>3</td>
<td>Spr(Collman)</td>
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<tr>
<td>23N</td>
<td>Chemistry and Biology</td>
<td>3</td>
<td>Win(Khosla)</td>
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<tr>
<td>24N</td>
<td>Nutrition and History</td>
<td>3</td>
<td>Spr(Huestis)</td>
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<tr>
<td>25Q</td>
<td>Science-in-Fiction is not Science Fiction</td>
<td>2</td>
<td>Win(Djerassi)</td>
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</tr>
<tr>
<td>27N</td>
<td>Lasers——The Light Fantastic</td>
<td>3</td>
<td>Aut(Moerner)</td>
<td></td>
</tr>
<tr>
<td>28N</td>
<td>Transforming Chemistry</td>
<td>3</td>
<td>Win(Taub)</td>
<td></td>
</tr>
<tr>
<td>45Q</td>
<td>Affordable Housing—A Social Entrepreneurship Start-up</td>
<td>4</td>
<td>Spr(Paulson, Behrman)</td>
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<tr>
<td>46Q</td>
<td>Fail Your Way to Success</td>
<td>3</td>
<td>Spr(Clough)</td>
<td></td>
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<tr>
<td>47Q</td>
<td>Discovering Micro-Organization Theory for Fast-Paced Project Teams</td>
<td>4</td>
<td>Win(Leveti)</td>
<td></td>
</tr>
<tr>
<td>61Q</td>
<td>Big Dams, the City Hall, and the Sierra Club</td>
<td>2</td>
<td>Aut(Kitanidis)</td>
<td></td>
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<tr>
<td>10N</td>
<td>Introduction to Archaeological Thought</td>
<td>4-5</td>
<td>Aut(Delaney)</td>
<td></td>
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<tr>
<td>19N</td>
<td>Horace, Kipling and Imperialism, Songs, and Law</td>
<td>3-4</td>
<td>Win(Treggiari)</td>
<td></td>
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<tr>
<td>22N</td>
<td>Technologies of Civilization, Writing, Number, Money</td>
<td>3-4</td>
<td>Aut(Netz)</td>
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<tr>
<td>23N</td>
<td>Cross Cultural Perspectives on Love</td>
<td>3-4</td>
<td>Aut(Syed)</td>
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<tr>
<td>113Q</td>
<td>New Media—The Future of the News</td>
<td>3-5</td>
<td>Win(Lewenstein)</td>
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<td>144N</td>
<td>Film Forum</td>
<td>1-3</td>
<td>Win(Breitrose)</td>
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<tr>
<td>149Q</td>
<td>Interethnic Communication</td>
<td>2</td>
<td>Win(Leets)</td>
<td></td>
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<tr>
<td>22N</td>
<td>Shakespeare and Performance</td>
<td>3</td>
<td>Spr(Parker)</td>
<td></td>
</tr>
<tr>
<td>24Q</td>
<td>Ethnicity and Literature</td>
<td>3-5</td>
<td>Aut(Palumbo-Liu)</td>
<td></td>
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<tr>
<td>34N</td>
<td>Other Spaces, Other People</td>
<td>3-5</td>
<td>Win(Boyi)</td>
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<tr>
<td>84Q</td>
<td>Shakespeare, Playing, Gender</td>
<td>3</td>
<td>Win(Parker)</td>
<td></td>
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<tr>
<td>115Q</td>
<td>Thinking in the Present—Discussions about 20th-Century European Philosophy</td>
<td>3</td>
<td>Aut(Gumbrecht)</td>
<td></td>
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<tr>
<td>81Q</td>
<td>Comparative Anatomy and Physiology of Mammals</td>
<td>3</td>
<td>Spr(Bouley)</td>
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<tr>
<td>82Q</td>
<td>Animal Models in Biomedical Research</td>
<td>3</td>
<td>Aut(Tolwani)</td>
<td></td>
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<tr>
<td>83Q</td>
<td>Horse Medicine</td>
<td>3</td>
<td>Win(Green)</td>
<td></td>
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<tr>
<td>99D</td>
<td>The Science of Art</td>
<td>3</td>
<td>Win(Levoy)</td>
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<tr>
<td>99G</td>
<td>The Two Cultures—Bridging the Gap</td>
<td>3</td>
<td>Aut(Roberts, Saldivar)</td>
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</tr>
<tr>
<td>99I</td>
<td>Business on the Information Highways</td>
<td>3</td>
<td>Win(Wiederhold)</td>
<td></td>
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<tr>
<td>99N</td>
<td>Ruler, Compass, and Computer-Computational Representations of Geometry</td>
<td>3</td>
<td>Spr(Guibas)</td>
<td></td>
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<tr>
<td>99Q</td>
<td>Universal Ideas in Computation</td>
<td>3</td>
<td>Spr(Engler)</td>
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<tr>
<td>99R</td>
<td>Digital Dilemas</td>
<td>3</td>
<td>Aut(Fox)</td>
<td></td>
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<tr>
<td>10N</td>
<td>Investigating Culture</td>
<td>4-5</td>
<td>Aut(Delaney)</td>
<td></td>
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<tr>
<td>44Q</td>
<td>How the Brain Is Built—A Molecular View of Development and Evolution</td>
<td>3</td>
<td>Spr(Scott)</td>
<td></td>
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<tr>
<td>12N</td>
<td>Antigone—From Ancient Democracy to Contemporary Dissent</td>
<td>4</td>
<td>Aut(Rehm)</td>
<td></td>
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<tr>
<td>14N</td>
<td>Contemporary German Drama from Brecht to Heiner Muller</td>
<td>4</td>
<td>Win(Weber)</td>
<td></td>
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<tr>
<td>15N</td>
<td>The Shakespearean Era</td>
<td>4</td>
<td>Aut(Eddelman)</td>
<td></td>
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<tr>
<td>17N</td>
<td>(Re)Viewing Valdez in the Year 2000</td>
<td>3</td>
<td>Win(Moraga)</td>
<td></td>
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<tr>
<td>180Q</td>
<td>Noam Chomsky—The Drama of Resistance</td>
<td>3</td>
<td>Win(Rehm)</td>
<td></td>
</tr>
<tr>
<td>189Q</td>
<td>Mapping and Wrapping the Body</td>
<td>3</td>
<td>Spr(Eddelman)</td>
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</tr>
<tr>
<td>93Q</td>
<td>World of Finance</td>
<td>3</td>
<td>Win(Marotta)</td>
<td></td>
</tr>
</tbody>
</table>
99Q. State, Market, and Development—(S,Sem)  
  4-5 units, Aut (Meier)

EDUCATION

137Q. Conceptualizing Human Motivation—East and West—(S,Sem)  
  3 units, Spr (Roeser)

ELECTRICAL ENGINEERING

47Q. Telecommunications and Networks—From Telegraphy to the Internet—(S,Sem)  
  3 units, Aut (D. Harris)

60Q. Man vs. Nature—Coping with Disasters Using Space Technology—(S,Sem)  
  3 units, Aut (Zebker)

93Q. Energy Processes—(S,Sem)  
  3 units, Aut (da Rosa)

ENGINEERING

1N. The Nature of Engineering—(F,Sem)  
  3 units, Aut (Freyberg)

ENGLISH

63N. New Yorker Writers—(F,Sem)  
  3 units, Aut (Tallent)

64N. From Cannibals to Vampires; or How to Consume the Other—(F,Sem)  
  3 units, Win (Gigante)

  3 units, Spr (Solomon)

69N. The Two Cultures—Bridging the Gap—(F,Sem)  
  3 units, Aut (Roberts, Saldivar)

72N. Jewish-American Literature—(F,Sem)  
  3 units, Win (Felstiner)

74N. Introduction to Caribbean Literature—(F,Sem)  
  3 units, Aut (Jones)

81Q. Women and Authority in the Middle Ages—(S,Sem)  
  3 units, Aut (Brown)

82Q. Shakespeare’s Plays—(S,Sem)  
  5 units, Aut (Rebholz)

FRENCH AND ITALIAN

108N. Female Saints—The Rhetoric of Religious Perfection—(F,Sem)  
  4 units, Aut (Cazelles)

147Q. Camus—Writer and Philosopher—(S,Sem)  
  3 units, Aut (Apostolidès)

189Q. Romance—Texts and Movies—(S,Sem)  
  4 units, Spr (Cazelles)

190Q. Parisian Cultures of the 19th and Early 20th Centuries—(S,Sem)  
  4 units, Spr (Bertrand)

194Q. Reality Redefined—From the First Millennium to the Renaissance—(S,Sem)  
  3-4 units, Win (Fusco, Napolitano)

FUNCTIONAL RESTORATION

70Q. Tissue Engineering—Ethics, Genes, and Cells—(S,Sem)  
  3 units, Aut (Smith)

GEOLOGICAL AND ENVIRONMENTAL SCIENCES

42N. Early Life on Earth—(F,Scm)  
  3 units, Aut (Lowe) alternate years, not given 2001-02

43N. Environmental Problems—(F,Scm)  
  3 units, Win (Loague)

45N. Environmental Quality, is it Getting Better or Worse?—(F,Scm)  
  3 units, Win (Switzer) alternate years, not given 2001-02

47N. “Secrets in the Mud”—A Look into the Field of Paleocenography—(F,Scm)  
  3 units, Win (Paytan) alternate years, not given 2001-02

48N. Volcanoes of the Eastern Sierra Nevada—(F,Scm)  
  3 units, Spr (Mahood) alternate years, not given 2001-02

49N. Field Trip to Death Valley—(F,Scm)  
  3 units, Win (Mahood, Miller)

50Q. The Coastal Zone Environment—(S,Scm)  
  3 units, Aut (Ingle)

52Q. Geologic Development of California—(S,Scm)  
  4 units, Spr (Ernst)

53Q. In the Beginning—Theories of the Origin of the Earth, Solar System, and Universe—(S,Scm)  
  3 units, Win (McWilliams)

54Q. California Landforms and Plate Tectonics—(S,Scm)  
  3 units, Aut (Miller)

55Q. The California Gold Rush—Geologic Background and Environmental Impact—(S,Dial)  
  2 units, Spr (Bird)

56Q. Change in the Coastal Ocean—The View from Monterey Bay—(S,Dial)  
  2 units, Spr (Dunbar)

57Q. How to Critically Read and Discuss Scientific Literature—(S,Scm)  
  3 units, Win (Paytan)

GEOPHYSICS

5Q. Earthquakes of the Americas—(S,Dial)  
  2 units, Aut (Kovach)

30Q. The 1906 San Francisco Earthquake—(S,Dial)  
  2 units, Spr (Beroza)

50Q. Earthquakes and Archaeology in the Eastern Mediterranean—Lectures and Field Trip—(S,Dial)  
  2 units, Win (Nur)

60Q. Man vs. Nature—Coping with Disasters Using Space Technology—(S,Scm)  
  3 units, Aut (Zebker)

GERMAN STUDIES

123N. The Brothers Grimm and their Fairy Tales—(F,Scm)  
  4 units, Spr (Robinson)
126Q. Reading German Literature—An Introduction—(S, Sem)
4 units, Aut (Berman)

161N. The Arthurian Legend in Literature and Film—(F, Sem)
3-5 units, Spr (Poor)

167N. German Film to 1945—(F, Sem)
4 units, Aut (Kenkel)

GYNECOLOGY AND OBSTETRICS
88Q. Learning the Language of the Cell—How Cells Communicate with Each Other—(S, Sem)
3 units, Spr (Coniti)

HEALTH RESEARCH AND POLICY
85Q. Current Issues in Women’s Health—(S, Sem)
3 units, Win (Kelsey)

89Q. Cross-Cultural Issues in Medicine—(S, Sem)
3 units, Win (I. Corso)

HISTORY
18N. Confronting Islam—The United States in the Middle East since 1967—(F, Sem)
4 units, Aut (Beinin)

19N. Peter the Great—The Individual Shaping History, History Shaping the Individual—(F, Sem)
4 units, Win (Kollmann)

24N. World War II—(F, Sem)
5 units, Spr (Weiner)

36N. Gay Autobiography—(F, Sem)
4 units, Aut (Robinson)

42N. The Invention of Liberty and the English Revolution, 1640-1660—(F, Sem)
4 units, Spr (Seaver)

45N. The Qur’an and its Interpreters—(F, Sem)
5 units, Spr (Dallal)

4 units, Spr (Jackson)

48Q. South Africa—Contested Transitions—(S, Sem)
3 units, Win (Samoff)

51N. Abraham Lincoln—Myth and Reality—(F, Sem)
3 units, Spr (Fredickson)

52N. The Atomic Bomb in Policy and History—(F, Sem)
4 units, Spr (Bernstein)

85Q. Jews and Muslims—(S, Sem)
5 units, Win (Rodrique)

90Q. Buddhist Political and Social Theory—(S, Sem)
5 units, Spr (Muncall)

HUMAN BIOLOGY
90Q. Contemporary Issues in Human Experimentation—(S, Sem)
3 units, Win (Constantinou)

91Q. Studies of Animal Behavior—(S, Sem)
3 units, Aut (Fernald)

94Q. The Nation’s Health—(S, Sem)
3 units, Spr (Lee)

95Q. Science-in-Fiction is not Science Fiction—(S, Dial)
2 units, Win (Djerassi)

97Q. Sport, Exercise, and Medicine: Exploring the Relationships—(S, Sem)
3 units, Aut (Matheson)

LANGUAGE CENTER
190Q. Literature and Culture of Modern Greece—(S, Sem)
3-5 units, Aut (Prionas)

LATIN AMERICAN STUDIES
87Q. Urbanization, Poverty, and Children in Latin America—(S, Sem)
5 units, Spr (Morrison)

LINGUISTICS
15Q. Rhythm in Language, Poetry, and Music—(S, Sem)
3 units, Win (Kiparsky)

17Q. Slips of the Tongue—(S, Sem)
3 units, Win (Zwicky)

30N. Language and Law—(F, Scm)
4 units, Spr (Traugott)

34N. Language of Advertising—(S, Sem)
3 units, Aut (Sells)

44N. Living with Two Languages—(F, Sem)
3 units, Spr (E. Clark)

MANAGEMENT SCIENCE AND ENGINEERING
192Q. International Environmental Policy—(S, Sem)
4 units, Aut (Weyant)

MATERIALS SCIENCE AND ENGINEERING
159Q. Research in Japanese Companies—(S, Sem)
3 units, Spr (Sinclair)

169Q. Issues in Science and Christianity—(S, Sem)
3 units, Win (Babe)

170Q. Materials in Sports—(S, Sem)
3 units, Spr (Clemens)

MATHEMATICS
83Q. Introduction to Contact Geometry—(S, Sem)
3 units, Win (Eliashberg)

84Q. Finite Mathematics, Codes, and Cryptography—(S, Sem)
3 units, Win (Carlsson)

85Q. Mathematical Stability and Asymptotics—(S, Sem)
3 units, Win (Simon)

86Q. Problem Seminar—(S, Sem)
3 units, Aut (Katznelson)

87Q. The Mathematics of Knots, Braids, and Tangles—(S, Sem)
3 units, Spr (R. Cohen)

MECHANICAL ENGINEERING
70N. The Aerodynamics of Sports Balls—(F, Sem)
3 units, Spr (Mungal)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
<th>Credits</th>
<th>Instructor(s)</th>
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<tbody>
<tr>
<td>72N</td>
<td>The Jet Engine—(F,Sem)</td>
<td>3 units</td>
<td>Eaton</td>
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<tr>
<td>73N</td>
<td>Designing the Human Experience—An Exploration into the Theory and Practice of Design Thinking—(F,Sem)</td>
<td>3 units</td>
<td>Leifer</td>
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<tr>
<td>75N</td>
<td>Mechanical Design Issues for Sports Equipment—(F,Sem)</td>
<td>3 units</td>
<td>Kenny</td>
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<tr>
<td>76N</td>
<td>The Science of Flames—(F,Sem)</td>
<td>3 units</td>
<td>Mitchell</td>
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<tr>
<td>77N</td>
<td>MEDICINE</td>
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<tr>
<td>78Q</td>
<td>Cancer and the Immune System—(S,Sem)</td>
<td>3 units</td>
<td>Negrin</td>
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<tr>
<td>89Q</td>
<td>Biomedical Ethics—(S,Sem)</td>
<td>3 units</td>
<td>Young</td>
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<tr>
<td>93Q</td>
<td>The AIDS Epidemic: Biology, Behavior, and Global Responses—(S,Sem)</td>
<td>3 units</td>
<td>Katzenstein</td>
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</tr>
<tr>
<td>96Q</td>
<td>Blood Diseases: From Hemophilia to Leukemia—(S,Dial)</td>
<td>2 units</td>
<td>Leung</td>
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</tr>
<tr>
<td>170Q</td>
<td>Decision Making in Law and Medicine—(S,Sem)</td>
<td>3 units</td>
<td>Medlin, Merino</td>
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<tr>
<td>25N</td>
<td>MICROBIOLOGY AND IMMUNOLOGY</td>
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<tr>
<td>100Q</td>
<td>Neurons and Disease—(S,Sem)</td>
<td>4 units</td>
<td>Madison</td>
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<tr>
<td>14N</td>
<td>Technology and the Arts—(F,Sem)</td>
<td>3 units</td>
<td>Berger</td>
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<tr>
<td>14Q</td>
<td>Music and Poetry—(S,Sem)</td>
<td>3 units</td>
<td>Mahrt</td>
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<tr>
<td>15Q</td>
<td>Debussy and the Music of French Impressionism—(S,Sem)</td>
<td>3 units</td>
<td>Cohen</td>
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<tr>
<td>16Q</td>
<td>Ki ho'alu—The New Renaissance of Hawaiian Musical Tradition—(S,Sem)</td>
<td>3 units</td>
<td>Sano</td>
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<tr>
<td>17N</td>
<td>The Operas of Mozart—(F,Sem)</td>
<td>3 units</td>
<td>Berger</td>
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<tr>
<td>66Q</td>
<td>NEUROLOGY AND NEUROLOGICAL SCIENCES</td>
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<tr>
<td>59N</td>
<td>21st Century Physics—Current Research Topics—(F,Sem)</td>
<td>1 unit</td>
<td>Dimopoulos</td>
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<tr>
<td>61N</td>
<td>NEUROSURGERY</td>
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<tr>
<td>103Q</td>
<td>Leukocyte Migration—(S,Dial)</td>
<td>1 unit</td>
<td>Michie</td>
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<tr>
<td>105Q</td>
<td>Final Analysis: The Autopsy as a Tool of Medical Inquiry—(S,Sem)</td>
<td>3 units</td>
<td>Regula</td>
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</tr>
<tr>
<td>106Q</td>
<td>Invertebrate Development and Insights into Cancer—(S,Dial)</td>
<td>2 units</td>
<td>Axelrod</td>
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<tr>
<td>68Q</td>
<td>PEDIATRICS</td>
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<tr>
<td>69Q</td>
<td>Strategies in Molecular and Cellular Imaging—(S,Sem)</td>
<td>3 units</td>
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<tr>
<td>70Q</td>
<td>PETROLEUM ENGINEERING</td>
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<tr>
<td>71Q</td>
<td>Soap Bubbles, Raindrops, and Inkjets—(S,Sem)</td>
<td>3 units</td>
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<tr>
<td>74Q</td>
<td>PHYSICS</td>
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<tr>
<td>75N</td>
<td>Philosophy</td>
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<tr>
<td>41N</td>
<td>41N. Mechanics— Insights, Applications, and Advances—(F,Sem)</td>
<td>1 unit</td>
<td>Romani</td>
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<tr>
<td>43N</td>
<td>Electricity—Understanding Electrical Phenomena—(F,Sem)</td>
<td>1 unit</td>
<td>Osheroff</td>
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<tr>
<td>45N</td>
<td>PHYSICS</td>
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<tr>
<td>59N</td>
<td>59N. 21st Century Physics—Current Research Topics—(F,Sem)</td>
<td>1 unit</td>
<td>Dimopoulos</td>
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<tr>
<td>61N</td>
<td>61N. Mechanics— Insights, Applications, and Advances—(F,Sem)</td>
<td>1 unit</td>
<td>Romani</td>
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<tr>
<td>63N</td>
<td>63N. Applications of Electromagnetism—(F,Sem)</td>
<td>1 unit</td>
<td>Thomas</td>
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</tbody>
</table>
SLAVIC LANGUAGES AND LITERATURES
13N. Russia, Russian, Russians—(F,Sem)
3-4 units, Spr (Schapbach)

SOCIOLOGY
25N. Understanding the Sixties—(F,Sem)
3-5 units, Win (McAdam)
27N. Cultural Patterns in Contemporary Society—(F,Sem)
3 units, Aut (Mark)

SPANISH AND PORTUGUESE
110N. Introduction to Chicana/o Literature and Visual Art—(F,Sem)
3-5 units, Aut (Yarbro-Bejarano)

111N. Contemporary Spain—The Challenge of Change, from Fascism to Democracy (1939 to Present)—(F,Sem)
3-5 units, Aut (Haro)
112N. The U.S.-Mexican Border Region in Film and Literature—(F,Sem)
3-5 units, Spr (Fox)

114N. Lyric Poetry—(F,Sem)
3-5 units, Spr (Fredmore)

175Q. Latin American Heroes and Heroines in Film and Literature—(S,Sem)
3-5 units, Win (Ruffinelli)
193Q. Spaces and Voices of Brazil—(S,Sem)
3-5 units, Spr (Wiedermann)

STATISTICS
44N. The Pleasures of Counting—(F,Sem)
3 units, Aut (Johnstone)

SURGERY
67Q. Medical Experiences in Foreign Lands—(S,Sem)
3 units, Win (Chase, Wang)
68Q. Current Concepts in Transplantation—(S,Sem)
3 units, Spr (Martinez, Kram)

UNDERGRADUATE RESEARCH OPPORTUNITIES (URO)

Director: Laura S. Selznick

The Undergraduate Research Opportunities (URO) program seeks to combine two of Stanford's greatest strengths: the eminence of its research faculty and excellence in undergraduate education. URO encourages students to work independently on projects with faculty and thus to participate directly in Stanford's research community.

The collaboration takes place in two principal formats. Faculty members may list ongoing research projects in which undergraduates can become involved. Or, undergraduates may design their own individual projects and pursue them under the sponsorship of an individual faculty member. The URO staff directs students to departments with established research programs, advertises opportunities submitted by individual faculty, and helps to develop resources.

Faculty who have participated in this program have found enthusiastic and energetic assistants, made better progress in research, and freed
Faculty members with ongoing research programs are encouraged to identify a piece of their project appropriate to undergraduate competencies and to list it through URO. (Purely menial or mechanical projects are not appropriate.) The researcher should clearly state the nature of the position, requisite background and qualifications, and the expected time commitment. Determination of credit appropriate to each project is left to the researcher and the student. The formula generally used is three hours of intellectual work per week per academic unit. (On average, students have received 3 units of credit per quarter in exchange for a commitment of ten hours per week.)

**RESOURCE FILES**

Students can obtain free access to two data bases designed to facilitate undergraduate research projects. The Odyssey and Faculty Interests files are available through the World Wide Web. Odyssey lists openings for student research assistance on faculty research projects. The Faculty Interests file contains information about the research interests of individual Stanford faculty across the University. Students can use faculty interest information in identifying potential sponsors for projects of their own design or in seeking advice about a particular discipline.

**FUNDING AVAILABLE**

The Fund for Undergraduate Research is administered by URO and is available exclusively to Stanford undergraduates. All applicants must file a cover sheet on the World Wide Web (http://www-uro.stanford.edu). Faculty recommendation forms and samples of previous successful grant applications are available at 414 Sweet Hall. Grant advice is available both in person and on the home page. The deadlines for major grants (up to $3,000) for 2000-01 are Friday, April 6 for projects in social sciences, natural sciences, and engineering and Friday, April 20 for projects in humanities and creative arts. Students with interdisciplinary projects are encouraged to apply by the earlier deadline.

Small grants ($500 maximum per project) are awarded each quarter. The deadlines are October 27, February 9, and April 20.

Major grants differ from small grants in the scope of the project proposed rather than the level of reimbursement requested. Small and major grants are restricted to supplies and expenses associated with research. Major grants are awarded once a year, during Spring Quarter, to as many as 150 students whose projects reflect the highest level of creativity and independence and the greatest promise for exciting results. Students on financial aid may sometimes receive funds to replace summer earnings expectations. Summer earnings can occasionally be replaced for small grant winners with a high level of financial need.

The Chappell-Lougee Scholars program is a special opportunity for sophomores in the humanities and social sciences to be involved in research under faculty mentorship. Faculty may nominate students or students may nominate themselves. Financial need is considered, as well as the academic goals of the proposed project. Applications and nominations are due to the URO office by Friday, December 1, 2000. The URO office has information on applications and criteria.

The Future Faculty Incentives Program encourages URO grant recipients from all categories to consider a career in college or university teaching. The award provides undergraduate loan repayment up to $10,000 for graduate work toward a Ph.D. Preference is given to students from disadvantaged backgrounds who would add diversity to the professoriate in their field of study. Financial need and evidence of disadvantaged background are also considered in the selection process. The application deadline is May 15 of the year in which the student plans to matriculate in a graduate program.

Stanford Fund Research Assistantships and Research Awards enable undergraduates in the humanities and social sciences with financial need to gain research experience in lieu of a campus job. Assistantships are for students who have not yet declared a major, but wish to explore a particular field under faculty supervision. Research Awards are for declared students with subject-matter expertise who wish to pursue that interest further. Recipients may have from 10 to 15 weeks of term-time earnings replaced. High financial need is a criterion for acceptance. A maximum of 25 weeks of work in undergraduate employment may be replaced.

Mellon Minority Undergraduate Fellowships promote diversity by encouraging the pursuit of honors at Stanford and enrollment in a Ph.D. program in the humanities after graduation from Stanford. Benefits include earnings replacement, scholarship expenses, and undergraduate loan repayment totaling a maximum of $20,000. The deadline is Friday, June 15, 2001.
School of Law


Dean: Kathleen M. Sullivan

Associate Deans: Frank F. Brucato, Mitchell W. Davis, Faye Deal, Susan Liataud, Julie Lythcott-Haims, Susan Robinson

Senior Associate Dean: Martin Shell

Academic Associate Deans: Richard Craswell, Mark G. Kelman (Autumn) Assistant Professor: R. Richard Banks

Marcus Cole

Associate Professor: G. Marcus Cole

Assistant Professor: R. Richard Banks

Professor (Teaching): William C. Lazier

Courtesey Professor: Abraham D. Sofaer

Senior Lecturers: David M. Mills, Maude H. Pervere


Visiting Professors: Akhil Reed Amar, Allen S. Hammond IV, Roderick M. Hills, Jr., Morton J. Horwitz, Rogelio Perez-Perdomo, Piet Jan Slot

The School of Law was established as a department of the University in 1893. Its purpose is to provide a thorough legal education for students who are fitted by their maturity and their previous academic training to pursue professional study under university methods of instruction. The curriculum leading to the first professional degree in law (J.D.) constitutes an adequate preparation for the practice of law in any English-speaking jurisdiction. Graduate work leading to the degrees of Master of the Science of Law and Doctor of the Science of Law are also offered. (For the full curriculum, see the Stanford University bulletin School of Law.) The school is on a two-term academic calendar. Autumn term classes begin on September 7, 2000. Spring term classes begin on January 29, 2001, and the term ends on May 18, 2001.

COURSES

The following courses are open to qualified graduate students in other departments of the University with the consent of the instructor:

236. Art and the Law—The range of problems that arise at the intersection of law and the visual arts (painting, sculpture, and graphic art): the protection of works of art in time of war, occupation, and civil strife; international traffic in stolen and smuggled cultural treasures; censorship, criticism, selection, and artistic freedom; copyright, moral right, and the proceeds right; art forgery, fakes, and consumer protection in the visual arts; legal relations between artists, dealers, museums, collectors, and auction houses; tax and estate problems of artists and collectors; legal services for artists; artnapping and insurance; legal problems of art museums, etc.

3 term units, Spr semester (Merryman)

307. Gender, Law, and Public Policy—Open to second- and third-year law students and other qualified students with consent of instructor. Topics: equal protection standards, employment, reproductive rights, sexual harassment, rape, domestic violence, pornography, sexual orientation, feminist legal theory, and the family.

3 term units, Spr semester (Rhode)

313. Health Law and Policy—(Same as Health Research and Policy 210.) Open to all law or medical students and, by consent of instructor, to qualified undergraduates. Introductory survey of the American health care system and its legal and policy problems. Topics: the special characteristics of medical care as compared with other goods and services, the difficulties of assuring quality care, the complex patchwork of the financing system, and the ethical problems the system raises.

3 term units, Aut semester (Greely)

433. International Labor Standards and Regulations—Preference to students who have taken labor law; applications in the Law School Registrar’s Office in October. The dynamics which have prompted a new focus on international labor standards, such as the movement of capital and labor across international boundaries. The idea of international labor standards and what may be appropriate. The machinery for development, administration, and enforcement of such standards through regional agreements like the NAFTA and the European Union. Focus is on the International Labor Organization, the World Trade Organization, and their respective mechanisms. Prerequisite: consent of instructor.

2 term units, Spr semester (Gould)

440. Biotechnology Law and Policy—Open to graduate and professional students and, by consent of the instructors, to qualified undergraduates. Interdisciplinary exploration of the legal and policy issues raised by the biotechnology industry. Patenting, corporate organization and financing, conflicts of interest, regulatory approvals, health care financing issues, and tort liability. The prospects for and implications of the biotechnology revolution. Interdisciplinary student groups present and discuss a solution to a series of hypothetical problems.

3 term units, Spr semester (Barton, Botstein, Greely)

611. Interdisciplinary Seminar on Conflict Resolution—(Same as Economics 386, Management Science and Engineering 459, Psychology 283.) Addresses problems of conflict resolution and negotiation from an interdisciplinary perspective. Presentations by faculty and scholars from other universities.

1 term unit, Win, Spr semester (Alexander, Arrow, Hensler, Ross, Wilson)

649. Advanced Issues in Health Law and Policy: Genetics and Law—(Same as Health Research and Policy 211.) Open to 20 students from any Stanford graduate or professional program. Writing seminar on the ethical, legal, and social issues raised by the revolution in human
genetics. Topics: DNA fingerprinting, genetic privacy, property rights in genes, genetic testing, genetic discrimination, transgenics, and eugenics.

2 term units (Greely)

NONPROFESSIONAL

The following course is open to undergraduates and graduate students in other departments, and may be counted toward the A.B. degree, but not toward professional degrees in law.

106. Introduction to American Law—(Same as American Studies 179, Political Science 182F.) American law for undergraduates. The structure of the American legal system, including the courts; American legal culture; the legal profession and its social role; the scope and reach of the legal system; the background and impact of legal regulation; the relationship between the American legal system and American society in general. Prerequisite: Political Science 10 or consent of instructor. GER:3b (DR:9)

5 units, Aut (Friedman)
School of Medicine

Dean: Eugene Bauer
Senior Associate Dean for Education and Student Affairs: Phyllis Gardner

The School of Medicine offers courses of study leading to the M.S., Ph.D., and M.D. degrees.

UNDERGRADUATE PROGRAMS

At the undergraduate level, a number of the school’s courses are open to any registered Stanford student who has fulfilled the prerequisites, subject to the usual limits of course enrollment and faculty approval. Details on admission into undergraduate programs are described in the “Undergraduate Degrees” section of this bulletin.

GRADUATE PROGRAMS

M.S. AND Ph.D. PROGRAMS

Departments offer programs leading to the Ph.D. degree. Applications and information for all graduate programs may be obtained from Graduate Admissions, Registrar’s Office, Stanford University, Stanford, California 94305-3005.

M.D. PROGRAMS

The School of Medicine provides an educational environment that encourages intellectual diversity and offers stimulation and opportunity for self-motivated students who are interested in developing a scholarly, investigative approach to problems in medicine. Accordingly, Stanford has designed its medical curriculum with a two-fold purpose: to develop in all students the capacity for leadership in the clinical practice of scientific medicine and to provide them opportunities to prepare themselves for careers in research and teaching in the various branches of basic, clinical, and social medicine. The flexible curriculum allows for individual needs in scheduling course work. Students develop study plans that take into consideration their academic background, particular strengths, and career objectives.

All medical students must complete a formal curriculum in the basic medical sciences and have formal clinical experience in medicine, surgery, pediatrics, gynecology-obstetrics, family medicine, and psychiatry. Following completion of 13 quarters of academic work, additional quarters may be taken at a special student rate. Involvement in research and outside course work may extend the time spent in medical school. Completion of the M.D. degree must be achieved within six years, unless a petition is granted to extend this time frame.

There are a variety of opportunities for in-depth study of subject areas in the basic sciences. Students with strong interests in medical research as a career are urged to investigate opportunities available under the auspices of the Medical Scientist Training Program (MSTP). This program provides a limited number of students the opportunity to pursue an individualized program of research and course work leading to both the M.D. and Ph.D. degrees. The estimated time for completion of the program is seven years. Students interested in participating in the MSTP are asked to provide supplemental information relevant to their research background and are considered for entry into the MSTP at the time of their application to the School of Medicine.

The admissions process recognizes that some minorities and women are under-represented in the medical profession, and especially in academic medicine; the school has a strong commitment to identify, recruit, and educate such students.

Provided an applicant to the school has completed the basic courses in physics, chemistry, and biology, the choice of an undergraduate major may reflect other interests, including the arts and humanities. Course work in mathematics and the behavioral sciences is highly recommended because of its importance in understanding medicine. Extracurricular activities and breadth of interests and experiences play an important role in the selection of students from among those applicants having superior records.

Further details on the M.D. degree, including admission requirements, are in the Stanford University School of Medicine Catalog, available on the World Wide Web at http://www-med.stanford.edu/school/catalog. For application materials write: Committee on Admissions, Stanford University, School of Medicine, 251 Campus Drive, Suite 309, Stanford, CA 94305-5404.

BIOCHEMISTRY

Emeriti: (Professors) Robert L. Baldwin, Paul Berg, David S. Hogness, Arthur Kornberg
Chair: Suzanne R. Pfeffer
Associate Professors: Patrick O. Brown, Gilbert Chu, Daniel Herschlag, Mark A. Krasnow
Assistant Professors: Pehr A. B. Harbury, Julie A. Theriot
Courtesy Professors: Chaitan S. Khosla, Sharon Long

Biochemistry is a department within the School of Medicine, with offices and labs located in the Beckman Center for Molecular and Genetic Medicine at the Stanford Medical Center. Courses offered by the department may be taken by undergraduate, graduate, and medical school students. A basic series in biochemistry (200, 203) is taught by the entire staff and requires a good background in organic chemistry and cell biology.

Advanced courses are offered in more specialized areas and they emphasize the most recent developments in biochemistry, cell biology, and molecular biology. These courses include the physical and chemical principles of biochemistry, enzyme reaction mechanisms, membrane trafficking and biochemistry, molecular motors and the cytoskeleton, mechanisms and regulation of nucleic acid replication and recombination, the biochemistry of bacterial and animal viruses, the molecular basis of morphogenesis, the molecular and cell biology of yeast, and the structure and function of both eukaryotic and prokaryotic chromosomes.

Opportunities exist for directed reading and research in biochemistry and molecular biology, utilizing the most advanced research facilities, including those for light and electron microscopy, chromatography and electrophoresis, protein and nucleic acid purification, rapid kinetic analysis, synthesis and analysis, single molecule analyses using laser light traps, microarray generation and analysis and computer graphic workstation facilities for protein and nucleic acid structural analysis. Ongoing research utilizes a variety of organisms, ranging from bacteria to animal cells.

GRADUATE PROGRAM

DOCTOR OF PHILOSOPHY

Requirements for the M.S. and Ph.D. degrees are described in the “Graduate Degrees” section of this bulletin. The department does not offer undergraduate degrees.

The Department of Biochemistry offers a Ph.D. program which begins in the Autumn Quarter of each year. The program of study is designed to prepare students for productive careers in biochemistry; its emphasis is training in research, and each student works closely with members of the faculty. In addition to the requirement for a Ph.D. dissertation based on original research, students are required to complete six advanced courses in biochemistry and related areas. Selection of these courses is tailored to fit the background and interests of each student. A second requirement involves the submission of three research proposals, which are presented by the student to a small advisory committee of departmental faculty members who are also responsible for monitoring the progress of student curricular and research programs. All Ph.D. students are expected to participate actively in the department’s seminar program, and students are encouraged to attend and to present papers at regional and
national meetings in cellular biochemistry and molecular biology. Teaching experience is an integral part of the Ph.D. curriculum and is required for the degree.

The Department of Biochemistry offers a M.S. degree only to students already enrolled in the Ph.D. program. Students should contact the Graduate Studies adviser for more details.

Those applying for graduate study should have at least a baccalaureate degree and should have completed work in cell and developmental biology, basic biochemistry and molecular biology, and genetics. Also required are: at least one year of university physics; differential and integral calculus; and analytical, organic, inorganic, and physical chemistry. The department is especially interested in those applicants who have research experience in biology or chemistry. Students must submit an application, including transcripts and letters of recommendation, by December 15.

Beginning September 1, applications are available and can be requested by mail from Graduate Admissions, Registrar's Office, Old Union, Stanford University, Stanford CA 94304-3005; by phone (650) 723-4291; or email at ck.gaa@forsythe.stanford.edu. Applications may also be submitted electronically at http://www.stanford.edu/dept/registrar/admissions/index.html and http://www.med.stanford.edu/school/biosciences/. Applicants are notified by April 1 of decisions on their applications. Stanford University requires scores from the Graduate Record Examination (GRE) (verbal, quantitative, and analytical), and applicants must submit scores from the GRE Subject Test in either biochemistry, biology, or chemistry. Applicants should take the October GRE exam.

All applicants are urged to compete for non-Stanford fellowships or scholarships, and U.S. citizens should complete an application for a National Science Foundation and a Howard Hughes Medical Institute Predoctoral Traineeship. Students are provided with financial support to cover normal living expenses; Stanford tuition costs are paid.

All applicants for admission to the department are considered without regard to race, color, creed, religion, sex, age, national origin, or marital status.

Postdoctoral research training is available to graduates who hold a Ph.D. or an M.D. degree. Qualified individuals may write to individual faculty members for further information.

At present, the primary research interests of the department are the structure and function of proteins and nucleic acids, the biochemistry and control of development processes, molecular motors and the cytoskeleton, the trafficking of proteins between membrane-bound organelles, the control and regulation of gene expression, bioinformatics/protein structure design, and the application of microarrays to problems in human health and disease.

COURSES

118Q. Stanford Introductory Seminar: Genomics, Bioinformatics, and Medicine—Preference to sophomores. The kind of knowledge gained from sequencing the human genome and the implications of such knowledge for medicine and biomedical research. Novel diagnostic methods and treatment of diseases, including gene therapy and drug design. The ethical implications of genetic information. The use of genome and disease databases to determine the function of genes involved in disease. Recommended: Biological Sciences 52 or Human Biology 2A.

200. Biochemical Structure, Metabolism, and Energetics—The structure and function of biological molecules, enzyme kinetics and mechanisms, bioenergetics, pathways of intermediary metabolism and their control, and membrane structure and function. Lectures on special topics. Prerequisites: organic chemistry, cell biology.

201. Advanced Molecular Biology—Lectures on rapidly developing topics in DNA structure and metabolism, chromosome structure and function, gene expression and its control, regulation of transcription, protein structure and function, RNA processing, and translation. Prerequisite: course in basic molecular biology.

203. Molecular Biology—Enrollment limited to medical students or by consent of instructors. DNA structure and metabolism, chromosome structure and function, gene expression and its control, regulation of transcription, protein structure and function, RNA processing, and translation. Minicourses provide in-depth treatment of material in the core lectures, topics with medical relevance, and reviews of original literature. Prerequisite: 200 or equivalent.

210. Advanced Topics in Membrane Biochemistry—The structure, function, and biosynthesis of cellular membranes and organelles. Based on current literature, with extensive student participation. Prerequisites: 200, 203, or equivalents, or consent of instructor.

211. Development in Microorganisms—Cell differentiation and multicellular development in microorganisms. Microbes are attractive subjects for molecular studies of the regulation of development because they can be manipulated easily by genetic and biochemical techniques, handled in large numbers, and because their genomes are relatively small. Topics: temporal and spatial regulation of cell division; sporulation; flagella and pili morphogenesis; positional information; cell-cell communication and multicellular development; signal transduction pathways. Lectures/readings in current literature.

213. Biological Signaling during Development—The biochemical and genetic analysis of the developmental response of cells, or cell clusters, to specific molecular signals. Signals vary from complex proteins to simple molecules (steroid hormones), and the responding cells vary from these in close proximity to signal-generating cells to all cells in the organism. Focus is on the signaling mechanisms and on the evolutionary conservation of these systems. Prerequisites: knowledge of basic biochemistry and genetics.

214. Physical and Chemical Principles of Biochemistry—The physical chemistry of proteins, nucleic acids and their complexes, and the chemistry underlying biological reactions; the principles of enzymatic catalysis. The physical and chemical concepts that are fundamental to biological processes. Appraisal of experimental and conceptual approaches and analysis of classic and current papers in the literature. Areas: interactions involved in protein and nucleic acid structure and folding; the energetic, chemical, and structural principles of enzymatic catalysis and control. Prerequisites: 200, 203 or equivalent, a course in physical chemistry, and a course in organic chemistry.

215. Frontiers in Biological Research—Same as Developmental Biology 215.) Faculty-student discussion, emphasizing how to critically evaluate primary research literature in different areas of biological research. Held in conjunction with a seminar series, hosted in alternate weeks by the departments of Biochemistry, Genetics, and Developmental Biology. Each Wednesday, distinguished investigators present their current work at the frontiers of biological research. Before the seminar, students and course faculty meet and discuss in depth one or more papers from the primary research literature on a related topic. After the seminar, students have the opportunity to meet informally with the seminar speaker to discuss their research and future directions. The techniques most commonly used to study problems in biology, and a comparison between the genetic and biochemical approaches in biological research.

217. Advanced Tutorial in Special Topics—Readings and tutorial in membrane biochemistry, enzyme mechanisms, chromosome structure,
biochemical genetics, bacterial and animal viruses, and nucleic acid enzymology. Conducted under the guidance of advanced graduate students and postdoctoral fellows.

1-3 units, any quarter (Staff)

218. Computational Molecular Biology—(Same as Biomedical Informatics 231.) For molecular biologists and computer scientists desiring a practical, hands-on approach to computational molecular biology; recommended for molecular biologists and computer scientists desiring to understand the major issues concerning representation and analysis of biological sequences and structure. Existing methods are critically described with the strengths and limitations of each. Future directions for development of new methods. Practical assignments utilizing the tools described. Topics: accessing molecular databases, pattern search, classification of sequence and structure, alignment of sequences, rapid similarity searching, phylogenies, automated pattern learning, representing protein structure, modeling protein structure by homology, protein-protein docking and protein-ligand docking. Final project utilizes or analyzes the methods presented. Lecture/Lab. Enrollment limited to 40. Prerequisite: introductory molecular biology at the level of Biological Sciences 52 or consent of instructor. Recommended: 210.

3 units, all quarters via Internet (Bruitlag)

221. The Teaching of Biochemistry—To be taken by all teaching assistants in 200, 203, or 217. Emphasizes practical experience in teaching on a one-to-one basis, and problem set design and analysis. Familiarization with current lecture and text materials is expected, along with evaluations of class papers and examinations. Prerequisite: enrollment in the Biochemistry Ph.D. program or consent of instructor.

3 units, any quarter (Staff)

225. Molecular Motor Proteins and the Cytoskeleton—(Same as Developmental Biology 225.) The molecular basis of energy transduction leading to movements generated by microfilament-based and microtubule-based motors. Analysis of forms of myosin, dynein, and kinesin and their roles in the cell, as a model for understanding the structural, biochemical, and functional properties of biological machines in general. Topics: structure of the molecular motors and their accessory proteins; regulation of the function of motile assemblies in cells; spatial and temporal controls on the formation of motile assemblies in cells. Experimental approaches: genetic analysis, DNA cloning and expression, reconstitution of functional assemblies from purified proteins, x-ray diffraction, three-dimensional reconstruction of electron microscope images, spectroscopic methods, and high-resolution light microscopy. Focuses on how a complex cellular process is analyzed at the molecular level by a multifaceted approach using biochemical, biophysical, and genetic techniques. Prerequisites: knowledge of basic biochemistry and cell biology.

3 units (Fuller, Spudich) not given 2000-01

237. Introduction to Biotechnology—(Same as Chemical Engineering 450, Civil and Environmental Engineering 237, Developmental Biology 237, Structural Biology 237.) Faculty from the departments of Biochemistry, Biological Sciences, Chemical Engineering, Civil and Environmental Engineering, Developmental Biology, Structural Biology, and invited industrial speakers review the interrelated elements of modern biotechnology. Topics: protein structure and dynamics, protein engineering, biocatalysis, gene expression, cellular metabolism and metabolic engineering, fermentation technology, and purification of biomolecules. Prerequisite: graduate student or upper-division undergraduate in the sciences or engineering.

3 units, Spr (Robertson, Swartz)

241. Biological Macromolecules—(Same as Structural Biology 241.) The molecular principles of protein and nucleic acid structures. The forces that stabilize biopolymers is presented with the goal of understanding three-dimensional structures and their functional implications. Topics: protein folding, domain structures, enzyme active sites, DNA and RNA structure, and protein-nucleic acid complexes.

3 units, Aut (Aldrich, Ferrell, Herschlag, Lewis, Puglisi, Weis)

242. Methods in Molecular Biophysics—(Same as Structural Biology 242.) Introduces students from diverse backgrounds to the potential utility of physical approaches to research and helps prepare them to evaluate literature that incorporates these methods. Experimental methods in molecular biophysics are from a theoretical and practical standpoint. Emphasis is on x-ray diffraction and nuclear and nuclear magnetic resonance spectroscopy. Fluorescence spectroscopy, circular dichroism, calorimetry, separation methods.

3 units, Win (Harbury, McKay, Puglisi, Weis)

294. DNA Repair, Recombination, and Replication—Enzymes and molecular mechanisms, and how some physiological aspects of DNA transactions may be explained at the molecular level. Prerequisites: 200, 203.

2 units (Lehman) not given 2000-01

299. Directed Reading—Prerequisite: consent of instructor.

1-18 units, any quarter (Staff)

399. Research and Special Advanced Work—Register by section numbers by arrangement with faculty. Prerequisite: consent of instructor.

1-18 units, any quarter

459. Frontiers in Interdisciplinary Biosciences—(Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible.) Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford's Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

2 units, Aut, Win, Spr (S. Block)

**CENTER FOR BIOMEDICAL ETHICS**

Co-Directors: Thomas A. Raffin, Ernle W. D. Young

Executive Director: Barbara A. Koenig

Steering Committee: Kenneth Arrow (Economics, emeritus), Paul Berg (Biochemistry, emeritus), David Cox (Stanford Human Genome Mapping Center), Ronald Davis (Biochemistry), Victor Fuchs (Economics, Health Research and Policy, emeritus), Linda Giudice (In Vitro Fertilization and Reproductive Endocrinology Laboratories), Mary Goldstein (General Internal Medicine, V.A. Palo Alto Medical Care System), Henry Greely (Law), Susan Okiri (Ethics in Society Program, Political Science), Debra Satz (Ethics in Society Program, Philosophy), Lucille Shapiro (Developmental Biology), David Stevenson (Pediatrics)

The Stanford University Center for Biomedical Ethics is an interdisciplinary center devoted to teaching and research in scientific and biomedical ethics. Its mission is to: apply ethical reasoning to actual moral problems in the practice of medicine and science; contribute to the national and international discussion of biomedical and scientific issues through research, public symposia, and published papers and monographs; convene scholars, professionals, and policy-makers to debate and
provide policy solutions regarding biomedical and scientific ethical issues; serve as a scholarly resource for the University, the Medical Center, and the community at large on emerging ethical issues in medicine and science; and build a community of individuals dedicated to formulating fresh responses to contemporary ethical issues.

The Program in Genomics, Ethics, and Society is multidisciplinary, and is housed within the Center for Biomedical Ethics. It addresses the compelling social, ethical, legal, and political implications of advances in human genetics.

COURSES

For further information, see the Stanford University School of Medicine Catalog.

ANTHROPOLOGICAL SCIENCES

174. Bioethics and Anthropology
5 units, Spr (Koenig)

BUSINESS

522. Business Ethics in the Biotechnology and Pharmaceutical Industry—Case studies for business and medical students. Company-sponsored research in academia, intellectual property, product research on humans including in the third world; product development, regulatory, marketing, post-marketing, and advertising activities. Focus is on the ethical and social consequences of business activity.
2-3 units, Win (Eaton)

MEDICINE

89Q. Stanford Introductory Seminar: Biomedical Ethics—Preference to sophomores. In-depth exposure to ethical theory, moral reasoning, and to important texts, dealing with different themes in biomedical ethics that apply to clinical ethical issues. Students assume significant responsibility for leading the sessions, along with the instructor. Objective: help students construct reasoned points of view on a variety of topics that can be defended publicly.
3 units, Aut (Young)

214. Literature and Medicine—Reading/discussion on the uses of literary arts as a companion to medical studies. Essays, stories, and poems on topics relevant to the basic and clinical sciences such as immunology, cardiology, AIDS, end of life, ethics, etc.
1 unit, Win (Shafer, Zaroff)

250A. Medical Ethics I—The major Western theories of ethical decision-making are applied to moral issues in medicine and the life sciences. Daily quandaries confronting clinicians are discussed as a whole or in small groups. Objectives: develop and apply a methodology for clinical decision-making; delineate core issues in biomedical ethics (the nature of the physician/patient relationship, informed consent, quality of life vs. sanctity of life, and the just distribution of finite medical resources); and to enable students to formulate their own positions with respect to contemporary issues and topics in biomedical ethics.
3 units, Win (Young)

250B. Medical Ethics II—Advanced examination of a narrower range of topics at greater depth. Topics vary each year. Students have an informed discussion with an invited expert on the topic under discussion. Objectives: examine the fundamental ethical principles informing the practice of medicine and the life sciences and the relationships between them; identify “non-rational” factors that enter decisively into ethical decision-making; struggle with emerging ethical issues in medicine and the life sciences; and suggest areas where greater conceptual clarity and methodological fitness is required. Recommended: some acquaintance with the field of biomedical ethics.
3 units, Spr (Young)

255. The Responsible Conduct of Research—A forum for scientists to familiarize themselves with institutional policies/practices and professional standards that define scientific integrity. Overview of ethics in research, authorship, patents, and human interest at the academic-commercial interface, and small group sessions for more extended discourse between students and faculty. Completion fulfills NIH/ADAMHA requirement for instruction in the ethical conduct of research.
(Young)

RELATED OFFERINGS

HEALTH RESEARCH AND POLICY

209. Medicine and the Law
3 units, Win (Eaton)

HUMAN BIOLOGY

25,35,4S. Bioethical Issues in Human Biology
1-2 units, Aut, Win, Spr (Hurlbut)

90Q. Stanford Introductory Seminar: Contemporary Issues in Human Experimentation
3 units, Win (Constantinou)

121. Ethical Issues in the Neurosciences
4-5 units, Spr (Hurlbut)

LAW

313. Health Law and Policy—(Same as Health Research and Policy 210.)
3 semester units, Aut (Greely)

440. Biotechnology Law and Policy
3 semester units, Spr (Barton, Botstein, Greely)

(Same as Health Research and Policy 211.)
2 semester units (Greely)

PHILOSOPHY

78. Medical Ethics
4 units, Spr (Jaworska)

193J. Feminist Bioethics
5 units, Spr (Jaworska)

BIOMEDICAL INFORMATICS PROGRAM

Committee: (Chair and Program Director) Russ B. Altman; (Associate Director) Lawrence M. Fagan; Douglas L. Brutlag; Parvati Dev; Alan M. Garber; Teri Klein; Mark A. Muse; Gio Wiederhold

Participating Faculty and Staff by Department:

Anesthesiology: David M. Gaba (Professor)
Biochemistry: Douglas L. Brutlag (Professor)
Biostatistics: Richard A. Olshen (Professor)
Business: Alain C. Enthoven (Professor, emeritus)
Computer Science: Edward A. Feigenbaum (Professor); Richard E. Fikes (Professor, Research), Daphne Koller (Assistant Professor), Gio Wiederhold (Professor, Research), Terry Winograd (Professor)
Economics: Alan M. Garber (Professor, by courtesy)
Electrical Engineering: Albert Macovski (Professor, emeritus)
Genetics: David Botstein (Professor), Stanley N. Cohen (Professor), Richard M. Myers (Professor)
Health Research and Policy: Byron W. Brown, Jr. (Professor, emeritus), Alan M. Garber (Professor, by courtesy), Mark A. Hiatky (Professor), Richard A. Olshen (Professor)
Management Science and Engineering: Samuel Holtzman (Consulting Associate Professor), Ronald A. Howard (Professor), Ross D. Shachter (Associate Professor)

Mathematics: Samuel Karlin (Professor, emeritus)

Mechanical Engineering: Scott L. Delp (Associate Professor)

Medical Informatics: Ramin Shahidi (Assistant Professor), Samuel Karlin (Professor, emeritus)

Management Science and Engineering: Thomas C. Rindfleisch (Senior Research Scientist), Lawrence M. Fagan (Senior Research Scientist), Alan M. Garber (Professor, Research), Mary Goldstein (Associate Professor), Michael Higgins (Consulting Associate Professor), Peter D. Karp (Consulting Assistant Professor), Teri Klein (Senior Research Scientist), John Koza (Consulting Professor), Mark A. Musen (Associate Professor), Douglas K. Owens (Associate Professor), Glenn Rennels (Consulting Associate Professor), Thomas C. Rindfleisch (Senior Research Scientist), Gilian Sanders (Assistant Professor, Research), Michael Walker (Consulting Assistant Professor)

Neurosurgery: John R. Adler (Professor), Ramin Shahidi (Assistant Professor, Research)

Obstetrics and Gynecology: W. LeRoy Heinrichs (Professor, emeritus)

Radiation Oncology: Arthur L. Boyer (Professor), Lei Xing (Assistant Professor, Research)

Radiology: Gary H. Glover (Professor), Sandy A. Napel (Associate Professor), Norbert J. Pelc (Professor), Geoffrey Rubin (Associate Professor)

Statistics: Trevor J. Hastie (Professor)

Structural Biology: Michael Levitt (Professor)

Surgery: Thomas Krummel (Professor), Charles Taylor (Assistant Professor, Research)

This interdisciplinary program was created in response to a recognized need for well-trained researchers and academic leaders in the expanding field of medical information sciences (medical informatics), which includes both bioinformatics and clinical informatics.

Stanford University's extensive computing facilities are described in the "Computer Science" section of this bulletin. In addition, the Biomedical Informatics Program has a network of personal computers, workstations, and servers running the Unix, Windows NT, Windows 95, and Macintosh operating systems. These machines are available for course work and research projects by trainees in the program.

GRADUATE PROGRAMS

The Biomedical Informatics Program is interdepartmental and offers instruction and research opportunities leading to M.S. and Ph.D. degrees in Biomedical Informatics, also known as Medical Informatics. All students are required to complete the core curriculum requirements outlined below, and also to elect additional courses to complement both their technical interests and their goals in applying medical informatics methods to clinical informatics, bioinformatics, or imaging informatics. Students who fail to maintain a 3.0 grade point average (GPA) in a category of the core curriculum are expected to pass a comprehensive exam in that area before the graduate degree is granted. In addition, all degree candidates must pass an oral examination that tests the student's ability to integrate the various components of the curriculum and to relate them to the overall field of medical informatics.

The core curriculum is common to all degrees offered by the program but is adapted or augmented depending on the interests and prior experience of the student. Deviations from the core curriculum outlined below must be justified in writing and approved by the student's Biomedical Informatics academic adviser and the chair of the Biomedical Informatics Committee. It should be noted, however, that the program is intended to provide flexibility and to complement other opportunities in applied medical research that exist at Stanford (for example, the Program on Engineering in Biology and Medicine). Although most students are expected to comply with the basic program of study outlined here, special arrangements can be made for those with unusual needs or those simultaneously enrolled in other degree programs within the University. Similarly, students with prior relevant training will have the curriculum adjusted to eliminate requirements that were met as part of their prior training.

CORE CURRICULUM

All students are expected to participate regularly in the Medical Informatics Student Seminar (201) and Colloquia (200), regardless of whether they register for credit in those courses. In addition, all students are expected to fulfill requirements in the following five categories:

1. Core Biomedical Informatics (15 units): students are expected to understand current applications of computers in medicine and to develop a broad appreciation for research in the management of biomedical information. Required courses are the two-quarter sequence Biomedical Informatics 210A and 210B (Introduction to Medical Informatics), plus 212 (Project Course), all of which should be taken during the first year in the program. Students must also take an additional 6 units of Biomedical Informatics course work (which may include cross-listed courses from other departments, but not including Biomedical Informatics 200, 201, 299, 302, or 303), selected in consultation with the academic adviser.

2. Computer Science (9 units): the student is expected to acquire a knowledge of the use of computers, computer organization, programming, and symbolic systems. It is assumed that students have had prior computing experience at least equivalent to Computer Science (CS) 109 and 150. All students are required to take a minimum of 9 units of courses in the Department of Computer Science. If similar courses have not been taken previously, these units must include CS 121, 161, and a course that requires significant programming and knowledge of machine architectures (for example, Electrical Engineering 182, CS 110, or the CS 193 series). For those who have taken such courses previously, replacement units may be taken from any other course in CS selected by the student and approved by the academic adviser. A course in databases is especially recommended. With the exception of CS 109 and 110, all other courses applied to the degree requirements must be numbered 137 or higher.

3. Decision Science and Statistics (9 units): students are required to take at least three courses that span the following four topics: basic probability theory, Bayesian statistics, decision analysis, and experimental-design techniques. Prior courses in statistics at least equivalent to Statistics 60 and calculus equivalent to Mathematics 42 are prerequisites. A prior course in linear algebra equivalent to Mathematics 103 or 113 is recommended. For the probability requirements, students may, for example, take Management Science and Engineering (MS&E) 120, Statistics 116, or MS&E 221. For the statistics requirements, options include, for example, Statistics 200 or 201, or Biomedical Informatics 233. For the third course requirements, options include, for example, decision analysis (MS&E 152 or 252), or cost effectiveness analysis (Biomedical Informatics 432). Specific courses, including possible substitutions, should be chosen in consultation with the student's academic adviser. Also recommended is a course in the psychology of human problem solving (for example, Psychology 256).

4. Biomedical Domain Knowledge (9 units): students are expected to acquire an understanding of pertinent life sciences and how to analyze a domain of application interest. Prior courses in biology at least equivalent to Biological Sciences 31 and 32 are prerequisites.

5. Social and Ethical Issues (6 units): candidates are expected to be familiar with key issues regarding ethics, public policy, financing, organizational behavior, management, and pertinent legal topics. Students may select at least 6 units from suitable courses that include, for example, Biomedical Informatics 250, 256, and 432; CS 201; Health Research and Policy 390, 391, and 392, or any other advanced course in policy and social issues proposed by the student and approved by the Biomedical Informatics academic adviser.

The core curriculum generally entails a minimum of 46 units of course work, but can require substantially more or less depending upon the courses selected and the previous training of the student. The varying backgrounds of students are well recognized and no one is required to take courses in an area in which he or she has already been adequately trained;
under such circumstances, students are permitted to skip courses or substitute more advanced work. Students design appropriate programs for their interests with the assistance and approval of their Biomedical Informatics academic adviser. At least 30 units of formal course work are expected.

MASTER OF SCIENCE

The University requirements for the M.S. degree are described in the "Graduate Degrees" section of this bulletin. This degree is designed for individuals who wish to undertake in-depth study of biomedical informatics. Normally, a student spends two years in the program and will implement and document a substantial project during the second year. The first year involves acquiring the fundamental concepts and tools through course work and research project involvement. All first- and second-year students are expected to devote 50 percent or more of their time participating in research projects. Research rotations are not required, but can be done with approval of the academic adviser or training program director. Graduates of this program are prepared to contribute creatively to basic or applied projects in biomedical informatics.

PROGRAM REQUIREMENTS

Programs of at least 54 units that meet the following guidelines are normally approved:

1. Completion of the core curriculum.
2. A minimum of 6 additional units of courses in Computer Science numbered 135 or higher, courses in Management Science and Engineering or Statistics numbered 200 or higher, Psychology 256 or 267, or relevant courses in other departments approved by the student's academic adviser.
3. Electives: additional courses to bring the total to 54 or more units.
4. Teaching: all students are expected to act as Teaching Assistants (TAs) for at least one course during their first two years of training. This will generally be Medicine 292 (the medical informatics short course), although another course approved by the program faculty may occasionally be substituted.

DOCTOR OF PHILOSOPHY

The University's basic requirements for the doctorate (residence, dissertation, examination, and so on) are discussed in the "Graduate Degrees" section of this bulletin. Individuals wishing to prepare themselves for careers as independent researchers in medical informatics, with applications experience in bioinformatics, clinical informatics, or imaging informatics, should apply for admission to the doctoral program. The following are additional requirements imposed by the Biomedical Informatics Interdisciplinary Committee:

1. A student should plan and successfully complete a coherent program of study including the core curriculum, oral examination, and additional requirements for the master's program. In addition, doctoral candidates are expected to take at least two more advanced courses (see categories under item '2' of the master's program requirements). The master's requirements, including the oral examination, should be completed by the end of the second year in the program (six quarters of study, excluding summers). Doctoral students are generally advanced to Ph.D. candidacy after completing the oral examination. A student's academic adviser has primary responsibility for the adequacy of the program, which is regularly reviewed by the Graduate Study Committee of the Biomedical Informatics program.

2. To remain in the Ph.D. program, each student must attain a grade point average (GPA) as outlined in the master's programs above, and must pass a comprehensive exam covering introductory level graduate material in any curriculum category in which he or she fails to attain a GPA of 3.0. The student must fulfill these requirements and apply for admission to candidacy for the Ph.D. by the end of six quarters of study (excluding summers). In addition, reasonable progress in the student's research activities is expected of all doctoral candidates.

COURSES

170Q. Stanford Introductory Seminar: Decision Making in Law and Medicine—Preference to sophomores. Legal and medical decisions are difficult for both the client/patient and the attorney/physician, especially when the stakes (financial or physical well-being) are high. Medical and legal professionals have developed different strategies for framing decisions and implementing this framework: who is the final decision maker, what are the ethical implications of different standards for decision making, and how to use the decision making process to make the health care legal system more comprehensible. The role of financial considerations in the decision making process for the client/patient, lawyer/doctor, financial stakeholders, community, and society. Readings from the decision analytic literature of medicine and psychology, and the client-counseling literature in law. Examples from law and medicine. 3 units, Win (Altman, Merino)

200. Biomedical Informatics Colloquium—Series of colloquia offered by program faculty, students, and occasional guest lecturers. Credit available only to students in a Biomedical Informatics degree program. (May be taken no more than three times for credit.) 1 unit, Aut, Win, Spr

201. Biomedical Informatics Student Seminar—For all students and faculty. Participants report on recent relevant articles from the Biomedical Informatics literature or their research projects. The ongoing experience, with feedback from faculty, is intended to teach presentation skills to Biomedical Informatics trainees. Credit available only to stu-
202. Clinical Diagnosis—Open only to students in a Biomedical Informatics degree program. Designed for learning the techniques of interviewing and symptom analysis through the study of a variety of common and well-defined clinical entities, and by role-playing in a problem-solving setting. See instructor.
3 units, not given 2000-01

205. Introduction to Biomedical Environments—Open only to students in a Biomedical Informatics or Health Services Research degree program who are not enrolled in the M.D. program and do not have an M.D. degree. Background introduction to the sites to be visited. Selected faculty introduce a variety of settings at Stanford Medical Center and the Veterans Affairs Medical Center: the medical wards, radiology, molecular biology research laboratories, outpatient clinics, emergency room, operating room, intensive care unit, psychiatry ward, and clinical lab. See instructor.
1 unit (Staff) not given 2000-01

210A. Introduction to Biomedical Informatics: Fundamental Methods—(Same as Computer Science 270A.) Issues in the modeling, design, and implementation of computational systems for use in biomedicine. Topics: controlled terminologies in medicine and biological science, ontologies, fundamental algorithms, basic knowledge representation, information dissemination and retrieval. Emphasis is on the principles of modeling data and knowledge in biomedicine and on the translation of resulting models into useful automated systems.
3 units, Aut (Mumen, Altman)

210B. Introduction to Biomedical Informatics: Systems and Requirements—(Same as Computer Science 270B.) Continuation of 210A. Survey of the major application areas in medical informatics, including clinical information systems, imaging systems, bioinformatics, public policy, decision support, and signal processing. Emphasis is on the system requirements, relevant data, algorithms, and implementation issues in each area. Prerequisite: 210A.
3 units, Win (Shahar, Dev)

212. Biomedical Informatics Project Course—(Same as Computer Science 272.) For students who have completed 210A, 210B, or 214, and who wish to implement those ideas in a computer program. Students may take 214 concurrently and complete a project that is coordinated between the two courses. Prerequisites: programming experience, 210B.
3 units, Sum (Altman, Koza)

214. Representations and Algorithms for Computational Molecular Biology—(Same as Computer Science 274.) Introduction to the basic computational issues and methods used in bioinformatics, including access and use of biological data sources on the Internet. Topics: basic algorithms for alignment of biological sequences and structures, computing with strings, phylogenetic tree construction, hidden Markov models, computing with networks of genes, basic structural computations on proteins, protein structure prediction, protein threading techniques, homology modeling, molecular dynamics and energy minimization, statistical analysis of 3D biological data, integration of diverse data sources, knowledge representation and controlled terminologies for molecular biology, graphical display of biological data, genetic algorithms and genetic programming applied to biological problems. See instructor for unit options. Prerequisites: programming skills and understanding of matrix algebra.
1-4 units, Spr (Altman, Koza)

1 unit, Spr (Altman, Koza)

226. Genetic Algorithms and Genetic Programming—(Same as Computer Science 426.) The genetic algorithm is a domain-independent algorithm for search, optimization, and machine learning patterned after Darwinian natural selection and naturally occurring genetic operators such as recombination; mutation; gene duplication, deletion, regulation; and embryonic development. Genetic programming is a domain-independent automatic programming technique that extends the genetic algorithm to the breeding of populations of computer programs capable of producing human-competitive results. Topics: introduction to genetic algorithms and genetic programming; the mathematical basis for genetic algorithms; implementation on parallel computers and field-programmable gate arrays; applications to problems of system identification, control, classification, analysis of genome and protein sequences; automatic synthesis of the design of topology, sizing, placement, and routing of analog electrical circuits; automatic synthesis of controllers; and automatic synthesis of other complex network structures.
3 units, Spr (Koza)

228. Influence Diagrams and Probabilistic Networks—(Enroll in Management Science and Engineering 355.)
3 units, Win (Shachter)

230. Seminar on Knowledge Acquisition for Expert Systems—For graduate students. Discussion of experimental approaches to the construction of expert-system knowledge bases. Topics: interviewing techniques, formal and informal approaches to modeling expert knowledge, and automated tools that facilitate knowledge acquisition. Enrollment limited to 20. Prerequisite: one course in artificial intelligence.
2 units, Spr (Mumen) alternate years, not given 2001-02

231. Computational Molecular Biology—(Same as Biochemistry 218.) For molecular biologists and computer scientists desiring a practical, hands-on approach to computational molecular biology; recommended for molecular biologists and computer scientists desiring to understand the major issues concerning representation and analysis of biological sequences and structure. Existing methods are critically described with the strengths and limitations of each. Future directions for the development of new methods. Practical assignments utilizing the tools described. Topics: accessing molecular databases, pattern search, classification of sequence and structure, alignment of sequences, rapid similarity searching, phylogenies, automated pattern learning, representing protein structure, modeling protein structure by homology, protein-protein docking and protein-ligand docking. Final project utilizes or analyzes the methods presented. Lecture/lab. Enrollment limited to 40. Prerequisite: Introductory molecular biology at the level of Biological Sciences 52 or consent of instructor. Recommended: 210A,B.
3 units, all quarters via Internet (Brutlag)

3 units, Win (Staff)

239. Computer-Based Medical Education—Directed reading and research for graduate-level students in the use of modern web-based hypermedia and simulation techniques in education. Possible topics: replacement of a lecture or a lab session, distance learning, student models, and clinical case simulations.
1-6 units, any quarter (Dev)

250. The U.S. Health Care System and Health Policy—(Enroll in Health Research and Policy 205.)
2 units, Win (Baker)

256. Economics of Health and Medical Care—(Same as Economics 156/256, Health Research and Policy 256.) Institutional, theoretical, and empirical analysis of the problems of health and medical care. Topics: institutions in the health sector; measurement and valuation of health; nonmedical determinants of health; medical technology and technology
A Ph.D. is offered in Cancer Biology.

The Cancer Biology Program is designed to provide a framework for students with an interest in the understanding and control of neoplastic processes. The program is based in departments appropriate to their specialty and is subject to the core requirements specified below. A Ph.D. is offered in Cancer Biology.

**COURSES**

Course work and lab instruction in the Cancer Biology Program conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog.

241, 242, 243. Molecular and Cellular Biology of Cancer—Three quarters, covering cancer cell biology, carcinogenesis, and the fundamental principles of therapy. Comprehensive view of the major relevant scientific bases and advances in areas directly relating to the understand
263. Apoptosis in Normal Development and Cancer—The importance of apoptosis (programmed cell death) in normal development and in transformation. Apoptotic paradigms in hemopoetic, neurological, and cardiovascular tissues, contrasted with those in malignant transformation and progression. Organized/coordinated by Assistant Professor Giaccia.

271. Frontiers in Cancer Research Seminar Series—Full-quarter course given by different lecturers on topics of major importance in cancer research.

299. Research—Students registered for the Ph.D. must register as soon as they begin dissertation-related research work.

COMPARATIVE MEDICINE

Chair: Linda C. Cork
Professor: Linda C. Cork
Associate Professor: Shaul Hestrin
Assistant Professors: Donna Bouley, Paul Buckmaster, Sherril Green, Glen Otto, Ravi Tolwani

The Department of Comparative Medicine is a clinical department and does not offer degrees, but its faculty offer courses and participate in teaching in other departments at the undergraduate and graduate level. Faculty members, most of whom are specialists in some veterinary medical specialty, also accept students to participate in ongoing research projects within the department and assist students with special research projects.

The discipline of Comparative Medicine utilizes the differences and similarities among species to understand basic biologic and disease mechanisms. Comparative Medicine incorporates the use of spontaneous or induced disease models as one of several approaches to research. Faculty members have expertise in anesthesiology, infectious diseases, molecular genetics, neuropathology, neuroscience, rodent biology, and so on.

COURSES

Course work and lab instruction in the Department of Comparative Medicine conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog.

81Q. Stanford Introductory Seminar: Comparative Anatomy and Physiology of Mammals—Preference to sophomores. Comparative approach to common mammals, laboratory, and domestic species. The unique adaptations of each species in terms of its morphological, anatomical, and behavioral characteristics. How these species interact with humans and the historical relationships between humans and these animal species.

83Q. Stanford Introductory Seminar: Horse Medicine—Preference to sophomores. Overview of the most common equine diseases, ranging from colic to lameness. Equine anatomy and physiology relevant to selected topics in equine medicine. Equine infectious diseases, respiratory disorders, care of the newborn foal, a “what’s your diagnosis” problem series, and emergency first aid strategies.

105/206. Principles of Animal Research—(Graduate students register for 206.) Overview of the methodology and principles of animal models in biomedical research: the comparative biology, anatomy, and physiology of a variety of animal models, and an introduction to animal genetics and the current methodology of producing transgenic animals. Examples of spontaneous and induced animal models of disease. The effects on research of underlying factors, e.g., disease, environment, and genetic background. The principles and methods of animal handling, anesthesia, surgery, analgesia, and necropsy. Wet labs provide a basis for proper animal procedures in biomedical research.

8Q. Stanford Introductory Seminar: Animal Models in Biomedical Research—Preference to sophomores. Overview of the usefulness of animal models in biomedical research (both naturally occurring animal models that mimic human disease and induced models developed by transgenic techniques) as tools to study mechanisms of disease and develop new therapeutic approaches. Examples of animal models in medical disciplines. The techniques utilized to develop animal models, including transgenic technology.

459. Frontiers in Interdisciplinary Biosciences—(Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible.) Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford’s Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

DEVELOPMENTAL BIOLOGY

Emeritus: (Professor) David S. Hogness
Chair: Roeland Nusse (Autumn), Matthew Scott (Winter, Spring, Summer)
Associate Chair: Matthew Scott (Autumn), Roeland Nusse (Winter, Spring, Summer)
Professors: Gerald Crabtree, Margaret Fuller, A. Dale Kaiser, Roeland Nusse, Matthew Scott, Lucy Shapiro, James Spudich, Irving Weissman
A fundamental problem in biology is how the complex set of multicellular structures that characterize the adult animal is generated from the fertilized egg. Advances at the molecular level, particularly with respect to the genetic control of development, have been explosive. These advances represent the beginning of a major movement in the biological sciences toward the understanding of the molecular mechanisms underlying developmental decisions and the resulting morphogenetic processes. This new thrust in developmental biology derives from the extraordinary methodological advances of the past decade in molecular genetics, immunology, and biochemistry. However, it also derives from groundwork laid by the classical developmental studies, the rapid advances in cell biology and animal virology, and from models borrowed from prokaryotic systems. Increasingly, the work is directly related to human diseases, including oncogene function and inherited genetic disease.

The Department of Developmental Biology includes a critical mass of scientists who are leading the thrust in developmental biology and who can train new leaders in the attack on the fundamental problems of development. Department labs work on a wide variety of organisms from microbes to worms, flies, and mice. The dramatic evolutionary conservation of genes that regulate development makes the comparative approach of the research particularly effective. Scientists in the department labs have a very high level of interaction and collaboration. The discipline of developmental biology draws on biochemistry, cell biology, genetics, and molecular biology.

The department is located in the Beckman Center for Molecular and Genetic Medicine within the Stanford University Medical Center.

**GRADUATE PROGRAM**

**MASTER OF SCIENCE**

Students in the Ph.D. program in Developmental Biology may apply for an M.S. degree, assuming completion of their course requirements and preparation of a written proposal. The master's degree awarded by the Department of Developmental Biology does not include the possibility of minors for graduate students enrolled in other departments or programs.

Students are required to take, and satisfactorily complete, at least three lecture courses offered by the department, including 210, Developmental Biology. In addition, students are required to take three courses outside the department. Students are also expected to attend Developmental Biology seminars and journal clubs. In addition, the candidate must complete a research paper proposing a specific experimental approach and background in an area of science relative to developmental biology.

**DOCTOR OF PHILOSOPHY**

University requirements for the Ph.D. are described in the “Graduate Degrees” section of this bulletin.

The graduate program in Developmental Biology leads to the Ph.D. degree. The department also participates in the Medical Scientists Training Program in which individuals are candidates for both the M.D. and Ph.D. degrees.

Students are required to take, and satisfactorily complete, at least six courses, including Developmental Biology (210); Advanced Genetics (203); Frontiers in Biological Sciences (215); and an advanced molecular biology, biochemistry, or biophysics course. Students are also expected to attend Developmental Biology seminars and journal clubs.

Successful completion of a qualifying examination is required for admission to Ph.D. candidacy. The examination consists of two parts. One proposal is on a subject different from the dissertation research and the other proposal is on the planned subject of the thesis. The final requirements of the program include the presentation of a Ph.D. dissertation as the result of independent investigation and constituting a contribution to knowledge in the area of developmental biology. The student must then successfully pass the University oral examination which is taken only after the student has substantially completed his or her research. The examination is preceded by a public seminar in which the research is presented by the candidate. The oral examination is conducted by a dissertation reading committee.

**COURSES**

Course work and lab instruction in the Department of Developmental Biology conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog.

44Q, Stanford Introductory Seminar: How the Brain is Built—A Molecular View of Development and Evolution—Preference to sophomores. Recent pioneering research into the molecular and genetic mechanisms that guide normal development of the mammalian brain. The initial events that create neural cells, how distinct functional domains are formed in the brain, and how the initial "wiring" of the brain during development is accomplished. How studies of brain development using a variety of animals are informative about our own brain development. Molecules that control brain development from an evolutionary perspective and from a systems design perspective. The medical consequences of malfunctions in those mechanisms, and the implications of recent research for regeneration and therapy.

3 units, Spr (Scott)

203. Advanced Genetics—(Same as Genetics 203, Biological Sciences 203.) Explores the genetic toolbox. Examples of analytic methods and modern synthetic genetic manipulation, including original papers. Emphasis is on use of genetic tools in dissecting complex biological pathways, developmental processes, and regulatory systems. Graduate students in biological sciences welcome; those with minimal experience in genetics should prepare themselves by working out problems in Suzuki, et al, or Hartl, et al.

4 units, Aut (Botstein, Kim, Stearns, Villeneuve, Sidow)

204. More Advanced Genetics—Offered upon request of students. Continuation of 203; basic concepts and experimental design in modern genetics. Emphasis is on studying genetic systems in detail from original papers, and the impact of genomics on experimental design and practice. Prerequisite: 203.

3 units, Win (Botstein, Kim, Stearns, Villeneuve)

206. Development and Disease Mechanisms—Focus is on the mechanisms that direct human development, from conception to birth. Conserved molecular and cellular pathways regulate tissue and organ development in humans and other species. Errors in these pathways result in congenital anomalies, and common human diseases. Topics: molecules regulating development, cell induction, developmental gene regulation, cell migration, programmed cell death, pattern formation, stem cells, cell lineage, and development of major organ systems. Emphasis is on links between development and clinically significant topics, including infertility, assisted reproductive technologies, contraception, prenatal diagnosis, multiparity, teratogenesis, inherited birth defects, and fetal therapy. Lectures connect fundamental discoveries in developmental biology to advances in disease diagnosis, therapy, and prevention in clinical medicine.

2 units, Aut (Scott, Seung Kim, Kingsley, Porzig)

210. Developmental Biology—Acquaints graduate students and advanced undergraduates (with consent of instructor only) with important current areas of research in developmental biology. How organismic complexity is generated during embryonic and post-embryonic development. The roles of genetic hierarchies, induction events, cell lineage, maternal inheritance, cell-cell communication, and hormonal control in developmental processes in well-studied organisms (e.g., mammals, zebrafish, insects, and nematodes). Teams taught. Students meet with faculty to discuss current papers from the literature, in depth. Recommended: familiarity with basic techniques and experimental rationales of molecular biology, biochemistry, and genetics.

5 units, Spr (Talbot, Fuller, Crabtree, Kingsley, Nusse, Scott, Seung Kim)
215. Frontier in Biological Research—(Same as Biochemistry 215.) Faculty-student discussion, emphasizing how to critically evaluate primary research literature in different areas of biological research. Held in conjunction with a seminar series, hosted in alternate weeks by the departments of Biochemistry, Genetics, and Developmental Biology. Each Wednesday, distinguished investigators present their current work at the frontiers of biological research. Before the seminar, students and course faculty meet and discuss in depth one or more papers from the primary research literature on a related topic. After the seminar, students have the opportunity to meet informally with the seminar speaker to discuss their research and future directions. The techniques most commonly used to study problems in biology, and a comparison between the genetic and biochemical approaches in biological research.

1 unit, Aut, Win (D. Kingsley, P. Harbury, Stuart Kim)

217. Mammalian Developmental Genetics—(Same as Genetics 217.) Topics: imprinting; early development and implantation; germ cell gene mapping and inbred strains; segregation and T locus; and germ and embryonic stem cells and teratocarcinomas. Weekly lecture, plus guest lecture or a literature discussion.

2 units, Win (Barsh, Nusse) alternate years, not given 2001-02

225. Molecular Motor Proteins and the Cytoskeleton—(Same as Biochemistry 225.) The molecular basis of energy transduction that leads to movements generated by microfilament-based and microtubule-based motors. In-depth analysis of forms of myosin, dynein, and kinesin and their roles in the cell as a model for understanding the structural, biochemical, and functional properties of biological machines in general. Topics: structure of the molecular motors and their accessory proteins, regulation of the function of motile assemblies in cells; spatial and temporal controls on the formation of motile assemblies in cells. Experimental approaches: genetic analysis, DNA cloning and expression, reconstitution of functional assemblies from purified proteins, x-ray diffraction, three-dimensional reconstruction of electron microscope images, spectroscopic methods, and high-resolution light microscopy. How a complex cellular process is analyzed at the molecular level by a multifaceted approach using biochemical, biophysical, and genetic techniques. Prerequisites: knowledge of basic biochemistry and cell biology.

3 units (Fuller, Spudich) not given 2000-01

237. Introduction to Biotechnology—(Same as Biochemistry 237, Chemical Engineering 450, Civil Engineering 237, Structural Biology 237.) Faculty from the departments of Biochemistry, Biological Sciences, Chemical Engineering, Civil Engineering, Developmental Biology, Structural Biology, and invited industrial speakers review the interrelated elements of modern biotechnology. Topics: protein structure and dynamics, protein engineering, biocatalysis, gene expression, cellular metabolism and metabolic engineering, fermentation technology, and purification of biomolecules. Prerequisites: graduate student or upper division undergraduate in the sciences or engineering.

3 units, Spr (Robertson, Swartz)

399. Research—Must register by section numbers.

1-18 units, any quarter (Staff)

459. Frontiers in Interdisciplinary Biosciences—(Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible.) Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford’s Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01.

Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

2 units, Aut, Win, Spr (S. Block)

Epidemiology Program

Director: Jennifer L. Kelsey (Professor of Health Research and Policy)
Steering Committee: (Professors) J. Martin Brown (Radiation Oncology), Byron W. Brown, Jr. (Health Research and Policy, Division of Biostatistics), Jennifer L. Kelsey (Health Research and Policy, Division of Epidemiology), Helena Kraemer (Psychiatry, and Medicine), Robert Marcus (Medicine; Division of Endocrinology, Gerontology, and Metabolism), Alice S. Whittemore (Health Research and Policy, Division of Epidemiology)

Cancer Biology: J. Martin Brown (Professor)
Genetics: Neil Risch (Professor)
Gynecology and Obstetrics: Emmet Lamb (Professor emeritus), Mary L. Polan (Professor)
Health Research and Policy: Paul Basch (emeritus), Rodney Beard (emeritus), Byron W. Brown, Jr. (emeritus), John Farquhar (Professor), Mark Hlatky (Professor), Jennifer Kelsey (Professor), Abby King (Associate Professor), Lorene Nelson (Associate Professor), Ralph Paffenbarger, Jr. (emeritus), Julie Parsonnet (Associate Professor), Atsuko Shibata (Assistant Professor), Robert Tibshirani (Professor), Alice Whittemore (Professor)

Medicine: James Fries (Professor), Alan Garber (Professor), Halstead Holman (Professor), Helen Hubert (Senior Research Scientist), Robert Marcus (Professor), Gordon Matheson (Associate Professor), Gary Schoolnik (Professor), Peter Small (Associate Professor), Lucy Tompkins (Professor), Marilyn Winkleby (Senior Research Scholar)

Microbiology and Immunology: Lucy Tompkins (Professor)
Neurology and Neurological Sciences: Leslie Dorfman (Professor)
Neurobiology: Denis Baylor (Professor)

PEDIATRICS: Ann Arvin (Professor), Laura Bachrach (Professor), Yvonne Maldonado (Associate Professor), Charles Prober (Professor)

Sanford Center for Research in Disease Prevention: John Farquhar (Professor), Stephen Fortmann (Professor), William Haskell (Professor), Helena Kraemer (Professor), Marcia Stefanick (Associate Professor, Research)

GRADUATE PROGRAMS

The Epidemiology Program offers interdisciplinary instruction and research opportunities leading to the M.S. and Ph.D. degrees in Epidemiology. The program has strengths in the following areas of epidemiology: cancer; cardiovascular, clinical epidemiology, infectious, musculoskeletal, and neurological diseases; genetics; some aspects of epidemiologic methods; and reproductive, environmental, and occupational epidemiology.

MASTER OF SCIENCE

The M.S. program is designed to provide training in epidemiologic methods to professionals in a variety of related fields and to serve as an introduction to those with bachelor’s degrees who are considering careers in epidemiology. Applicants to the M.S. program should have previous course work in biology and statistics or mathematics.

To receive the degree, students are expected to obtain a thorough grounding in epidemiologic methods and applied biostatistics and to demonstrate research skills through the completion of a master’s thesis. A total of 45 units of course work, including a 12-credit master’s thesis, must be successfully completed. Required courses are Health Research and Policy (HRP) 225 (Design and Conduct of Epidemiologic Studies), 226 (Advanced Epidemiologic Methods), 238 (Seminar/Journal Club in
Epidemiology), 261 (Intermediate Biostatistics), and 262 (Regression, Prediction, Survival Analysis); Statistics 190 (Statistics for Social Scientists), and 161 (Introduction to Statistical Methods II); and a master's thesis of 12 units or more. In addition, M.S. students are required to select two other courses in epidemiology. The master's thesis must be read and approved by two faculty members.

A new curriculum in clinical research methods has been established specifically to enhance the training of clinical investigators. This program is aimed primarily at physicians who have completed residency, are entering clinical fellowships, and who plan to engage in clinical research. It is also suitable for physicians at other points in their careers. Requirements of the program include those of the M.S. degree described above, as well as HRP 251, Design and Conduct of Clinical Trials.

DOCTOR OF PHILOSOPHY

The Ph.D. program in Epidemiology is designed to prepare individuals for careers in research and teaching in epidemiology. It is recommended that applicants have previous course work in biology and statistics or mathematics. Normally, successful applicants will have a master's degree in a relevant field or at least two years of relevant research experience.

Candidates for the Ph.D. degree must complete 72 units of graduate course work and research. Course requirements include all those listed for master's students (unless taken previously), HRP 224 (Statistical Issues in Epidemiology), Genetics 344A (Genetic Epidemiology), and an additional course in epidemiology. A student must select a specialty area (for example, cardiovascular diseases, cancer, clinical epidemiology, genetics, infectious diseases, musculoskeletal diseases, neurological diseases, reproductive disorders). Additional courses are required in each specialty area. Requirements for the specific specialty areas may be obtained from the Program Coordinator, and depending on the specialty area, include one or more of the following courses: Cancer Biology 241 (Molecular and Cellular Biology of Cancer); Genetics 344A (Genetic Epidemiology); HRP 201 (Infectious Basis of Disease), HRP 251 (Design and Conduct of Clinical Trials); Human Biology 156 (Human Development), Human Biology 166 (Cardiovascular Disease Prevention and Epidemiology); Neuroscience 200 (The Nervous System); Health Research Policy 251 (Design and Conduct of Clinical Trials); and Pathology 230A (General and Special Pathology).

Successful completion of three written qualifying examinations is required for admission to Ph.D. candidacy. The qualifying examinations cover: (1) epidemiologic methods, (2) biostatistics, and (3) a specialty area (for example, epidemiology and pathobiology of cancer, or cardiovascular diseases). Requirements also include the presentation of a Ph.D. dissertation as the result of independent investigation and contributing a contribution to knowledge in epidemiology. The candidate must then successfully pass the University oral examination, which is taken only after the student has substantially completed his or her research. The examination is preceded by a public seminar in which the research is presented by the candidate. The oral examination is conducted by a dissertation reading committee.

COURSES

The course listings of individual departments participating in the Program in Epidemiology should be consulted for complete descriptions.

GENETICS

Emeritus: (Professor) L. L. Cavalli-Sforza
Chair: David Botstein
Associate Professors: Gregory S. Barsh, Michele P. Calos, Mark A. Kay, Stuart K. Kim, Tim Stearns

Assistant Professors: Julie C. Baker, James M. Ford, Joanna L. Moutain, Arend Sidow, Anne M. Villeneuve, Douglas E. Vollrath
Professors (Research): Leonore A. Herzenberg
Assistant Professors (Research): Laura Lazzeroni, Zijie Sun
Visiting Professor: Alberto Piazza
Visiting Associate Professor: Ian C. Hsu

GRADUATE PROGRAMS

University requirements for the Ph.D. degree are described in the "Graduate Degrees" section of this bulletin.

The Ph.D. program in the Department of Genetics offers graduate students the opportunity to study in all the major areas of modern genetics research, including many aspects of human genetics (linkage mapping, physical mapping, cytogentic, genetic epidemiology and population genetics), bacterial and yeast genetics, Drosophila developmental genetics, mouse genetics, immunogenetics, and mathematical biology. The department also includes two Genome Centers, the Stanford Human Genome Mapping Center, and the Stanford DNA Sequence and Technology Center which are engaged in state-of-the-art mapping and sequencing of human and model organism genomes.

The department believes genetics should be viewed as a discipline that encompasses not just a set of tools but a coherent and fruitful way of thinking about biology and medicine. It emphasizes, in the teaching of doctoral students and physician-scientists, the broad scope of genetic thinking including not just molecular genetics, but also classical, medical, and population genetics. The department provides training through laboratory rotations, dissertation research, a series of advanced courses in genetics and other areas of biomedical science, several seminar series and colloquia, journal clubs, and an annual three-day retreat that includes faculty, students, postdoctoral fellows, and staff scientists. A strong emphasis is placed on interactions among students, postdoctoral students, and faculty within the department and throughout the campus.

The Department of Genetics is located in the School of Medicine and includes modern, well-equipped laboratories. Extensive computer support and advanced instrumentation are available for research projects. The department has 25 to 30 graduate students and 30 to 35 postdoctoral fellows. In addition to interacting with the faculty and laboratories in the department, students have contacts with a much larger number of students, fellows, and faculty in other biological and biomedical programs throughout the University.

During their first year, graduate students in the department take advanced graduate courses and sample several areas of research by doing laboratory rotations in three or four labs in the department. At the end of the first year, students select a lab in which to do their dissertation research. While the dissertation research is generally performed in one lab, collaborative projects with more than one faculty member are encouraged. In addition to interacting with their faculty preceptor, graduate students receive input regularly from other faculty members who serve as advisers on their dissertation committee. Study for the Ph.D. generally requires between four and five years of graduate work, most of which is spent on the dissertation research.

Graduate students are generally enrolled in the Ph.D. program, although a limited number of M.D. candidates can combine research training in genetics with their medical studies. Ph.D. candidates who have passed the qualifying exam in the second year can opt to receive the M.S. degree.

There are opportunities for graduate students to teach in graduate level and professional school courses, although there is no formal teaching requirement. In addition, students are encouraged to participate in an educational outreach program that is administered through the department and which involves numerous opportunities to interact with secondary school students and teachers, lay groups, and local science museums.

Students who have recently received a bachelor's, master's, M.D., or Ph.D. degree in related fields may apply for graduate study in the Department of Genetics. Prospective students must have a background in general biology, chemistry, mathematics, and physics. Decisions for admission are based on a comparison of the relative merits of all the candidates' academic abilities and potential for research. Students who wish to pur-
by the previous November 15. All students accepted into the Ph.D. pro-
der prior to November 15, and are able to apply for fellowships by
the previous November 15. All students accepted into the Ph.D. pro-
gram are provided with full tuition and a stipend to cover costs of living.
Three training grants from the U.S. National Institutes of Health provide
major support for the graduate training program in the department. Oth-
er students are encouraged by department funds and from the research
grants, both federal and private, of the faculty. In addition, a number of
graduate students are funded by fellowships from the National Science
Foundation or the Howard Hughes Medical Institute. Prospective stu-
dents are encouraged to apply for fellowships from these institutes by
requesting applications from the National Science Foundation, Oakridge
Associated Universities, P.O. Box 3010, Oak Ridge, TN 37831-3010,
telephone (615) 483-3344; Howard Hughes Medical Institute, Fellow-
ship Office, National Research Council, 2101 Constitution Avenue, NW,
Washington, D.C. 20418, telephone (202) 334-2872. Applications are
due on November 1 of each year.

COURSES

For further information on the availability of courses, consult the
quarterly Time Schedule, or inquire at the department office. Additional
courses in or related to genetics are included in the listings of the depart-
ments of Biological Sciences, Biochemistry, Developmental Biology,
Microbiology and Immunology, and Structural Biology.

201. Human Genetics—The theoretical and experimental basis for
human genetics. Lectures/reading in molecular, chromosomal, cellular,
developmental, population, and medical genetics, emphasizing the lat-
ter. Prerequisites: knowledge of biochemistry and basic genetics.

4 units, Spr (Cox, Francke, Barsh)

203. Advanced Genetics—(Same as Developmental Biology 203, Bio-
logical Sciences 203.) Explores the genetic toolbox. Examples of analyt-
ic methods and modern synthetic genetic manipulation, including origi-
nal papers. Emphasis is on use of genetic tools in dissecting complex
biological pathways, developmental processes, and regulatory systems.
Graduate students in biological sciences welcome; those with minimal
experience in genetics should prepare themselves by working out prob-

4 units, Aut (Botstein, Kim, Stearns, Villeneuve, Sidow)

209. Genetics of Vision and Vision Disorders—Background informa-
tion about the developmental biology of the eye, the physiology of vision,
and the biology of vision disorders that have a genetic basis. Examples
of genetically-related research problems involving study of vision and/
or vision disorders.

1 unit (Cohen) alternate years, not given 2001-02

210. Advanced Human Genetics—For students in the Genetics Ph.D.
program; other graduate students by arrangement. Companion course for
201. Advanced principles of human and medical genetics. In-depth
discussion of human genetics; examples from recent literature. Emphasis
is on molecular genetics and on experimental approaches.

2 units, Spr (Cox, Risch)

217. Mammalian Developmental Genetics—(Same as Developmental
Biology 217.) Topics: imprinting; early development and implantation;
germs and cell allotment; phenotypic consequences of targeted knockouts
of developmental, hox, and other developmental genes in mammals; tum-
origenesis; coat color mutations; classical mutations and positional
cloning; mutagenesis and insertion and gene traps; growth controls and

COURSES

For further information on the availability of courses, consult the
quarterly Time Schedule, or inquire at the department office. Additional
courses in or related to genetics are included in the listings of the depart-
ments of Biological Sciences, Biochemistry, Developmental Biology,
Microbiology and Immunology, and Structural Biology.

201. Human Genetics—The theoretical and experimental basis for
human genetics. Lectures/reading in molecular, chromosomal, cellular,
developmental, population, and medical genetics, emphasizing the lat-
ter. Prerequisites: knowledge of biochemistry and basic genetics.

4 units, Spr (Cox, Francke, Barsh)

203. Advanced Genetics—(Same as Developmental Biology 203, Bio-
logical Sciences 203.) Explores the genetic toolbox. Examples of analyt-
ic methods and modern synthetic genetic manipulation, including origi-
nal papers. Emphasis is on use of genetic tools in dissecting complex
biological pathways, developmental processes, and regulatory systems.
Graduate students in biological sciences welcome; those with minimal
experience in genetics should prepare themselves by working out prob-

4 units, Aut (Botstein, Kim, Stearns, Villeneuve, Sidow)

209. Genetics of Vision and Vision Disorders—Background informa-
tion about the developmental biology of the eye, the physiology of vision,
and the biology of vision disorders that have a genetic basis. Examples
of genetically-related research problems involving study of vision and/
or vision disorders.

1 unit (Cohen) alternate years, not given 2001-02

210. Advanced Human Genetics—For students in the Genetics Ph.D.
program; other graduate students by arrangement. Companion course for
201. Advanced principles of human and medical genetics. In-depth
discussion of human genetics; examples from recent literature. Emphasis
is on molecular genetics and on experimental approaches.

2 units, Spr (Cox, Risch)

217. Mammalian Developmental Genetics—(Same as Developmental
Biology 217.) Topics: imprinting; early development and implantation;
germs and cell allotment; phenotypic consequences of targeted knockouts
of developmental, hox, and other developmental genes in mammals; tum-
origenesis; coat color mutations; classical mutations and positional
cloning; mutagenesis and insertion and gene traps; growth controls and
Igs; muscle and limb development; sex determination; classical genetics
and gene mapping and inbred strains; segregation and T loci; and germ
and embryonic stem cells and teratocarcinomas. Weekly lecture, plus
guest lecture or a literature discussion.

2 units (Barsh, Nusse) alternate years, given 2001-02

222. Method and Logic in Experimental Genetics—For graduate
students only. Experimental design. Weekly topics central to research in
genetics, biochemistry, and molecular biology: protein subunit equilib-
rium, domain structure of proteins, cooperativity, precursor/product
relationships, and macromolecular interactions. Emphasis is on student
participation and analysis of the logical principles underlying experi-
ments in these areas. Papers, classic and contemporary, from primary
literature relevant to the weekly topic.

3 units, Win (Myers, Vollrath)

231. Gene Therapy—Gene therapy is developing new vectors and
disease applications. Approaches include viral and non-viral vectors,
delivery methods, and target cells. History and ethical considerations.
Lectures by Stanford faculty, and guest speakers from industry and other
institutions. Students participate in question sessions after each lecture.

3 units, Spr (Blau, Calos, Nolan)

344A. Genetic Epidemiology—(Same as Statistics 344A.) Methods for
the design and analysis of studies in human genetics, focusing on the
epidemiology of Mendelian disorders and the genetic and environmental
contributions to common, complex familial traits. Topics: study designs
for assessing the importance of genetic factors (family, twin, and adopt-
tion studies); methods for determining modes of inheritance (segregation
analysis); identification and mapping of major genes through linkage
analysis and disease-marker associations. Applications to birth defects,
coronary heart disease, psychiatry, neurology, cancer, and immunology.

3 units (Risch)

344B. Topics in Statistical Genetics—(Same as Statistics 344B.) In-
depth discussion of statistical methods currently used in human genetic
analysis. Topics depend on interests of the students and instructors:
concepts of likelihood as used in the genetic context; measures of familial
aggregation, including issues of censoring and age-dependent data;
genetic modeling of quantitative traits; mode of inheritance analysis,
including segregation analysis; analysis of extended pedigrees; paramet-
ric and nonparametric approaches to linkage analysis and gene mapping,
including family studies, radiation hybrid data, sperm typing, and DNA
contig mapping; linkage disequilibrium; analysis of DNA profiles for
individual identification; DNA sequence analysis.

3 units (Risch)

344C. Genetic Epidemiology: Applications—Sequel to 344A, focusing
on application of methods from genetic epidemiology to various
diseases: family studies, segregation analysis, linkage analysis, and
population association studies. The disease topics are tailored to the
interests of the students, from cancer (breast or colon), neurological
disorders (multiple sclerosis, epilepsy), birth defects (cleft lip and palate,
ypernic sclerosis), psychiatry (schizophrenia, manic-depression, Alzhe-
imer's disease), cardiovascular disease, autoimmune disease (diabetes,
coeliac disease), etc.

2 units (Risch) alternate years, given 2001-02

260. Supervised Study—Prerequisite: consent of instructor.

any quarter (Staff)

299. Directed Reading—Prerequisite: consent of instructor.

any quarter (Staff)

399. Individual Research—Prerequisite: consent of instructor.

any quarter (Staff)
The Department of Gynecology and Obstetrics does not offer degrees; however, qualified medical, graduate, or undergraduate students with an interest in basic research in reproductive biology may apply to arrange individual projects under the supervision of the faculty. The focus for the Division of Reproductive Biology is the study of molecular and cellular biology of the male and female reproductive organs.

**COURSES**

88Q. Learning the Language of the Cell: How Cells Communicate with Each Other—Introduction to signaling and the molecular mechanisms that mediate cell-cell communication through lectures/reviews of the primary literature. Topics: the basic concepts of the integration of cell function in multicellular organisms; the chemical nature of extracellular signals; the basic concepts of receptor, signal transduction, and protein phosphorylation; autocrine, paracrine, and endocrine communications. Emphasis is on cell-cell interactions in reproductive organs, cell adaptation, sensory reception, sperm/egg signaling during fertilization, chemotaxis, cell surface recognition, and examples of disease caused by disruption of cell-cell communication. The commonly used experimental approaches, including available molecular, genetic, and cell biology tools. Students design experiments addressing selected topics in cell signaling. Prerequisite: one or more quarters of Biological Sciences core. 3 units, Spr (Conti)

**HEALTH RESEARCH AND POLICY**

Emeriti: (Professors) Paul Basch, Byron Wm. Brown, Jr., Alain Enthoven, Victor R. Fuchs, Lincoln E. Moses, Ralph S. Paffenbarger, Jr. Chair: Mark Hlatky Professors: Bradley Efron, Trevor Hastie, Mark Hlatky, Iain M. Johnstone, Jennifer L. Kelsey, Richard A. Olshen, Robert Tibshirani, Alice S. Whittemore Associate Professors: Abby King, Lorene M. Nelson, Julie Parsonnet Assistant Professors: Laurence Baker, M. Kate Bundorf, Atsuko Shibata Professor (Research): Philip W. Lavori Associate Professor (Research): Dan Bloch Assistant Professor (Research): Laura Lazzeroni Courtesy Professors: Alan M. Garber, Stephen P. Fortmann, Neil Risch Courtesy Associate Professors: Mary Goldstein, Mark McClellan, Douglas Owens, David R. Rogosa Courtesy Assistant Professors: Michael K. Gould, Alex Macario Courtesy Assistant Professor (Research): Gillian Sanders Senior Lecturer: Irene Corso Lecturer: Laurel A. Habel Consulting Professors: Gary Friedman, Jack S. Mandel, Joseph Selby Consulting Associate Professor: Mary Louise Skouron Consulting Assistant Professor: Paul Barnett, Cieran Phibbs, John Piette Visiting Professor: Elizabeth Holly Visiting Associate Professor: Marion Lee

The Department of Health Research and Policy has three divisions: Health Services Research, Epidemiology, and Health Policy. Each division offers courses in its areas of specialization. These are described fully in the Stanford University School of Medicine Catalog.

**GRADUATE PROGRAMS**

The Program in Epidemiology and the Program in Health Services Research are housed in the Department of Health Research and Policy. These programs are described separately within the School of Medicine listings of this bulletin. Students with an interest in pursuing advanced degrees with an emphasis on biostatistics can do so through programs offered by the Department of Statistics. Division of Biostatistics faculty participate in these programs.

**COURSES**

Course work and instruction in the Department of Health Research and Policy conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this bulletin.

85Q. Stanford Introductory Seminar: Current Issues in Women's Health—Preference to sophomores. Current issues in women's health from an epidemiologic perspective. Possible topics (as they pertain to women): coronary heart disease, breast cancer (or other cancers), osteoporosis, HIV infection, eating disorders, depression, domestic abuse, benefits and risks of oral contraceptives, benefits and risks of hormone replacement therapy, new replacement therapies (e.g., SEMs), current prevention trials in women (e.g., the Women's Health Initiative), menopause, menstruation, health issues for athletes, health issues in developing countries, adverse pregnancy outcomes, obesity, cigarette smoking. Prerequisite: knowledge of human biology. 3 units, Win (Kelsey)

89Q. Stanford Introductory Seminar: Cross-Cultural Issues in Medicine—Preference to sophomores. Cross-cultural issues that impact health care delivery, e.g., ethnicity, immigration, language barriers, and service expectations. Fosters an understanding of culturally unique and non-English speaking populations, developing interpersonal and communication skills with diverse ethnic groups. 3 units, Win (Corso)

202. Introduction to Clinical Research—Required for medical students. Introduces epidemiological concepts, techniques, and studies: statistical reasoning and the application of common statistical procedures used in lab and clinical investigations. Student-designed research project. 4 units, Win (Lavori, Parsonnet)

205. The U.S. Health Care System and Health Policy—Introduces issues in health care systems, organization, and financing including health insurance, managed care, health care costs, the uninsured, and health reform, focusing on the U.S. health care system. 2 units, Win (Baker)

206. Statistical Methods for Meta-Analysis—(Same as Education 493B, Statistics 211.) Meta-analysis is a quantitative method for combining results of independent studies, and enables researchers to synthesize the results of related studies so that the combined weight of evidence can be considered and applied. Examples from the medical, behavioral, and social sciences. Topics: literature search, publication and selection bias, statistical methods (contingency tables, cumulative methods, sensitivity analyses, non-parametric methods). Project. Prerequisites: basic sequence in statistics. 3 units, not given 2000-01

209. Medicine and the Law—Areas of the law that pertain to the practice of medicine. Topics: medical malpractice, patient consent and confidentiality rights, human subject research, withdrawing life support
and physician-assisted suicide, futile medical care, legal requirements in psychiatry, physician discipline, and medical staff law.

3 units, Win (Eaton)

210. Health Law and Policy—(Same as Law 313.) Open to all law or medical students by consent of the instructor, and to qualified graduate and undergraduate students. Introductory survey of the American health care system and its legal and policy problems. Topics: the special characteristics of medical care compared to other goods and services, the difficulties of assuring quality care, the complex patchwork of the financing system, and the ethical problems the system raises.

5 units, Aut (Greely)

211. Advanced Issues in Health Law and Policy: Genetics and Law—(Same as Law 649.) Open to 20 students from any Stanford graduate or professional program. Writing seminar on the ethical, legal, and social issues raised by the revolution in human genetics. Topics: DNA fingerprinting, genetic privacy, property rights in genes, genetic testing, genetic discrimination, transgenics, and eugenics.

3 units, Aut (Greely)

212. Cross-Cultural Medicine—Provides the interviewing and behavioral skills needed to facilitate culturally relevant health care across all population groups. The explicit and implicit cultural influences operative in a variety of formal and informal medical contexts.

3 units, Spr (Corso)


3 units, Spr (Nelson, Balise)

224. Statistical Issues in Epidemiology—Selected advanced problems in the design and analysis of epidemiological studies, motivated by published investigations. Possible topics: issues in matching controls to cases in case-control studies, methods for analyzing data from cohort studies, and methods for the design and analysis of family and genetic studies. Prerequisites: 203, 225, 226, or equivalents.

3 units (Whittemore) alternate years, not given 2001-02

225. Design and Conduct of Epidemiologic Studies—Intermediate-level. Provides students with the knowledge and skills to design, carry out, and interpret epidemiologic studies, particularly of chronic diseases. Topics: epidemiologic concepts, sources of data, cohort studies, case-control studies, cross-sectional studies, sampling, estimating sample size, questionnaire design, and the effects of measurement error. Prerequisite: 202 or equivalent, or consent of instructor.

3-4 units, Aut (Kelsey)

226. Advanced Epidemiologic Methods—The principles of measurement, measures of effect, confounding, effect modification, and strategies for minimizing bias in epidemiologic studies. Prerequisite: 225 or consent of instructor.

3-4 units, Win (Friedman)

227. Epidemiology of Musculoskeletal and Neurologic Disorders—Epidemiologic contributions to understanding the etiology of conditions such as osteoporosis and fractures, congenital and developmental musculoskeletal disorders, arthritic disorders, disability, Alzheimer’s disease and dementia, stroke, epilepsy, headache, chronic neurologic diseases, and head and back injuries. Emphasis is on the methodologic issues important to the study of musculoskeletal and neurologic disorders. Prerequisite: 225 or consent of instructors.

3 units (Kelsey, Nelson) alternate years, not given 2001-02

228. Molecular Epidemiology—Molecular and biochemical biomarkers for measuring exposure, host susceptibility, and endpoint (disease) as applied to epidemiologic studies of infectious diseases, cancer, and other chronic diseases. Topics: DNA fingerprinting to determine transmission pathways; biochemical markers of environment exposures; study design and methodological consideration; ethical and legal issues. Prerequisite: 202 or 225, or consent of instructor.

3 units (Shibata) alternate years, given 2001-02

229. Occupational and Environmental Epidemiology—Current issues in occupational and environmental epidemiology. Environmental exposures as the causes of disease and methodologic issues that arise in occupational and community studies. Possible topics: ionizing radiation, air pollution, global climate change, electric and magnetic fields, manufactured gas-contaminated sites, arsenic, exposure assessment, investigation of small risks, uncertainty and the precautionary principle, and risk assessment methods.

3 units, Aut (Kheifets)

230. Cancer Epidemiology—Lectures/discussions on key issues in cancer epidemiology. Topics: descriptive epidemiology and sources of incidence/mortality data; the biological basis of carcinogenesis and its implications for epidemiologic research; methodological issues relevant to cancer research; causal inference; major environmental risk factors; genetic susceptibility; cancer control; examples of current research; and critique of the literature. Prerequisite: 202 or 225, or consent of instructor.

3 units (Shibata) alternate years, not given 2001-02

231. Epidemiology of Infectious Diseases—The principles of the transmission of the infectious agents (viruses, bacteria, rickettsiae, mycoplasma, fungi, and protozoan and helminth parasites). The role of vectors, reservoirs, and environmental factors. Pathogen and host characteristics that determine the spectrum of infection and disease. Endemicity, outbreaks, and epidemics of selected infectious diseases. Principles of control and surveillance.

3 units (Parsonnet) alternate years, not given 2001-02

238. Seminar/Journal Club in Epidemiology—On-going research is presented by faculty, staff, students, and guests, and recent journal articles are discussed.

1 unit, Aut, Win, Spr (Staff)

251. Design and Conduct of Clinical Trials—The rationale for Phases 1-3 clinical trials, the recruitment of subjects, techniques for randomization, data collection and endpoints, interim monitoring, and reporting of results. Emphasis is on the theoretical underpinnings of clinical research and the practical aspects of conducting clinical trials.

3 units, Win (M. Hlatky)

256. Economics of Health and Medical Care—(Same as Biomedical Informatics 256, Economics 156/256; undergraduates register for 156.) Institutional, theoretical, and empirical analysis of the problems of health and medical care. Topics: institutions in the health sector; measurement and valuation of health; nonmedical determinants of health; medical technology and technology assessment; demand for medical care and medical insurance; physicians, hospitals, and managed care; international comparisons. Prerequisite: Economics 50 and 102A or equivalent statistics, or consent of instructor. Recommended: Economics 51.

5 units, Win (McClellan)

257. U.S. Health Policy—Introduction to the institutions and policies that influence health care provision and costs in the U.S. Topics: the organization of the health care delivery system; the structure of hospitals; physician organizations and the health care networks; and the financing of health care, including health insurance, Medicare, and Medicaid. Current issues in health care policy.

3 units (Baker) not given 2000-01
260A, B, C. Workshop in Biostatistics—(Same as Statistics 260A, B, C.)
Applications of statistical techniques to current problems in medical science. Enrollment for more than 2 units of credit involves extra reading or consulting and requires consent of the instructor.  
260A. 1-5 units, Aut (Olshen, Bloch, Efron, Hastie, Johnstone, Lazzeroni, Tibshirani)  
260B. 1-5 units, Win (Olshen, Bloch, Efron, Hastie, Johnstone, Lazzeroni, Tibshirani)  
260C. 1-5 units, Spr (Olshen, Bloch, Efron, Hastie, Johnstone, Lazzeroni, Tibshirani)  

3 units, Win (Tibshirani, Betts)  

3 units, Spr (Olshen)  

263. Health Issues in Young Women—(Enroll in Feminist Studies 140.R.)  
5 units, Win (Cobb)  

266. Cardiovascular Disease Epidemiology and Prevention—The epidemiological, biological, and behavioral perspectives of cardiovascular disease, and assessment and modification of the risk factors relating to it. The potential for disease prevention in the context of major prevention trials. Public policy ramifications. Topics: diet, weight control, smoking, Type-A behavior, and exercise. Prerequisites for undergraduates: Human Biology core and consent of instructor.  
2-3 units (King) not given 2000-01  

280. Spanish for Medical Students—(Same as Spanish 121M.) Teaches students useful medical Spanish. Emphasis is on oral communication skills. Topics: the human body, hospital procedures, diagnostics, food, and essential phrases for on-the-spot reference when dealing with Spanish-speaking patients.  
3 units, Aut (L. Corso)  

281. Spanish II for Medical Students—(Same as Spanish 122M.) Can be taken as continuation of 280 or independently as a stand alone course, depending on the student's ability level.  
3 units, Win (L. Corso)  

282. Spanish III for Medical Students—(Same as Spanish 123M.) Can be taken as continuation of 281 or independently as a stand alone course, depending on the student's ability level.  
3 units, Spr (L. Corso)  

283. Core Seminar—Presentation of research in progress and tutorials in the field of health services research.  
1 unit, Aut, Win, Spr, Sum (Baker, Bundorf, Garber, Hlatky, Owens)  

290. Advanced Spanish Conversation—Intensive practice of oral language skills covering, e.g., how to conduct a full pediatric, gynecological, and other specialty exams; patient health education and counseling; and diseases like diabetes, asthma, and TB. Prerequisite: Spanish proficiency or consent of instructor.  
3 units, Aut, Win, Spr (L. Corso)  

291. Intensive Spanish for Medical Students—Covers over two quarters the regular Spanish 280-282 three-quarter sequence.  
6 units, Sum (L. Corso)  

299. Directed Reading—Aspects of preventive medicine, public health, social aspects of disease and health, economics of medical care, occupational or environmental medicine, epidemiology, international health, or related fields. Prerequisite: consent of the instructor.  
1-18 units, any quarter (Staff)  

391. Political Economy of Health Care in the United States—(Same as Business E331.) The financial and public policy context in which the health care system operates, and the issues in public policy controlling it in the public expenditure. Issues: financing and organization for the delivery of health care in the U.S., how various existing and proposed financing and organizational arrangements affect the allocation of resources, fee-for-service practice and health maintenance organizations, hospital investment decisions and regional planning, health care costs, and national health insurance. Prerequisite: graduate student.  
4 units, Spr (Kessler)  

392. Cost-Benefit Analysis in Health Care—(Same as Business E332, Biomedical Informatics 432.) For graduate students. How do you do cost-benefit analysis when the "output" is difficult or impossible to measure? How do M.B.A. analytic tools apply in health services? Study/discussion of the main literature on the principles of cost-benefit analysis applied to health care. Critical review of actual studies. Emphasis is on the art of practical application.  
4 units, Aut (Garber, Sanders)  

399. Research—Qualified students undertake investigations sponsored by individual faculty members. Prerequisite: consent of the instructor.  
1-18 units, any quarter (Staff)  

HEALTH SERVICES RESEARCH PROGRAM

Director: Mark Hlatky (Professor, Health Research and Policy, and Medicine)  
Executive Committee: Laurence Baker (Assistant Professor, Health, Research and Policy), M. Kate Bundorf (Assistant Professor, Health, Research and Policy), Alan Garber (Professor, Medicine), Mary Goldstein (Associate Professor, Medicine), Mark Hlatky (Professor, Health Research and Policy, and Medicine), Douglas Owens (Associate Professor, Medicine)  
Participating Departments and Faculty:  
Economics: Thomas MaCurdy (Professor), Mark McClellan (Associate Professor)  
Business: Alain Enthoven (Professor, emeritus), Daniel Kessler (Associate Professor)  
Health Research and Policy: Laurence Baker (Assistant Professor), Paul Barnett (Consulting Assistant Professor), Byron W. Brown (Professor, emeritus), M. Kate Bundorf (Assistant Professor), Victor Fuchs (Professor, emeritus), Mark Hlatky (Professor), Jennifer Kelsey (Professor), Philip Lavori (Professor, Research), Richard Olshen (Professor), Ciaran Phibbs (Consulting Assistant Professor), John Piette (Consulting Assistant Professor), Anita Stewart (Visiting Scholar), Robert Tibshirani (Professor)  
Management Science and Engineering: Margaret Brandeau (Professor)  
Law: Henry Greely (Professor)
GRADUATE PROGRAM

MASTER OF SCIENCE

The Master's Degree Program in Health Services Research seeks to train students in the quantitative analysis of issues in health and medical care. The program emphasizes an individually designed program of course work and completion of a master's project under the mentorship of a faculty member. The typical student in the program is either a physician who has completed residency training and is preparing for a research career, or a student with a strong background in policy analysis who wishes to focus on problems in health or medical care. Faculty interests include outcomes research, health economics, health care organization, quality of care, decision analysis, clinical guidelines, and assessment of patient preferences and quality of life.

To receive the degree, students are expected to demonstrate knowledge of issues in health services research and the quantitative skills necessary for research in this area. Students must take at least 45 units of course work (9 of the units may be double-counted to meet other degree requirements) and write a University thesis. The course work requirements are:

1. At least 8 units from the following group of Health Research and Policy (HRP) core courses: 256, Economics of Health; 391, Political Economy of Health Care; 392, Cost-Benefit Analysis in Health Care.
2. At least 6 units of graduate-level statistics courses. The sequence of HRP 261 and 262 is strongly recommended. (Note: HRP 202 does not count toward the statistics requirement.)
3. At least 3 units of HRP 283, Core Seminar.
4. At least 15 units of HRP research credit from 299, Directed Reading; 399, Research.
5. An additional set of approved elective courses to complete the program total of at least 45 units.
6. A background in health sciences equivalent to Biomedical Informatics 205, Introduction to Clinical Environments.

For additional information, address inquiries to the Program Administrator, Department of Health Research and Policy, Stanford University School of Medicine, HRP Redwood Building, Room T150, Stanford, California 94305-5405.

IMMUNOLOGY PROGRAM

Chair, Executive Committee for the Immunology Program: Irving Weissman (Professor of Pathology, and Developmental Biology)

Director for Immunology Program: Hugh McDevitt (Professor of Microbiology and Immunology)

Director for Clinical Immunology Program: C. Garrison Fathman (Medicine/Immunology and Rheumatology)

Participating Departments and Faculty:

Biological Sciences: Patricia P. Jones (Professor)

Cardiothoracic Surgery: Carol Clayberger (Associate Professor, Research, and Pediatrics)

Chemistry: Harden M. McConnell (Professor, emeritus*)

Genetics: Leonard A. Herzenberg (Professor), Lenore A. Herzenberg (Professor, Research)

Medicine/Bone Marrow Transplantation Program: Robert Negrin (Associate Professor), Judith Shizuru (Associate Professor)

Medicine/Immunology and Rheumatology: C. Garrison Fathman (Professor), Jane R. Parnes (Professor), Samuel Strober (Professor). Paul J. Utz (Assistant Professor)

Medicine/Oncology: Gilbert Chu (Associate Professor, and Biochemistry), Ronald Levy (Professor), Shoshana Levy (Professor, Research)

Microbiology and Immunology: Yueh-Hsiu Chien (Associate Professor), Mark M. Davis (Professor), K. Christopher Garcia (Assistant Professor, and Structural Biology), Hugh O. McDevitt (Professor)

Molecular and Cellular Physiology: Richard S. Lewis (Associate Professor)

Molecular Pharmacology: Garry F. Nolan (Associate Professor, and Microbiology and Immunology), Phyllis Gardiner (Associate Professor, and Medical/Clinical Pharmacology, and Cardiovascular Medicine)

Neurology and Neurological Sciences: Lawrence Steinman (Professor, and Pediatrics)

Pathology: Eugene C. Butcher (Professor), Michael Cleary (Professor), Gerald R. Crabtree (Professor, and Developmental Biology), Edgar G. Engleman (Professor, and Medical/Immunology and Rheumatology), Joseph S. Lipsick (Professor), Sara Michie (Associate Professor), Raymond A. Sobel (Associate Professor), Irving L. Weissman (Professor, and Developmental Biology)

Pediatrics: Alan M. Krensky (Professor), David B. Lewis, (Associate Professor), Elizabeth Mellins (Associate Professor), Dale T. Umetsu (Professor)

Structural Biology: Peter Parham (Professor, and Microbiology and Immunology)

Surgery: Sheri Krams (Assistant Professor, Research), Olivia Martinez (Associate Professor, Research)

* Recalled to active duty

GRADUATE PROGRAMS

MASTER OF SCIENCE

Students in the Ph.D. program in Immunology may apply for an M.S. degree in Immunology, assuming completion of appropriate requirements. Students must complete:

1. Three full-tuition quarters of residency as a graduate student at Stanford.
2. At least 45 units of academic work, all of which must be in courses at or above the 100 level, 36 units of which must be at or above the 200 level.
3. Three quarters of graduate research (Immunology 300), consisting of rotations in the labs of three faculty members.
4. Course work in Immunology as follows: one course in basic immunology (Biology 230, Microbiology/Immunology 200 or equivalent Advanced Immunology such as Immunology 200 and 201); Principles of Biological Technologies (Microbiology/Immunology 215); Cell Biology of Physiological Processes (Molecular and Cellular Physiology 221).
5. Graduate-level biochemistry and molecular biology (Biochemistry 200, 201, or equivalents).
6. Course work in Immunology 311 (Seminar in Immunology), and Immunology 311A (Seminar Discussion in Immunology).
7. Participation in journal clubs, and attendance at the weekly Immunology seminar and at the annual Stanford Immunology Scientific Conference.
8. One written qualifying exam and proposal before candidacy.

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. are described in the "Graduate Degrees" section of this bulletin.

The interdepartmental Immunology Program offers instruction and research opportunities leading to a Ph.D. in Immunology. The goal of the program is to develop young investigators who have a solid foundation in immunology as well as related sciences and who can carry out innovative research. The program features a flexible selection of courses and seminars to enrich the students' backgrounds, combined with extensive
research training in the laboratories of the participating immunology faculty.

Students applying to the program typically have an undergraduate major in biological sciences, but majors in other areas are acceptable if the applicants have had sufficient course work in biology and chemistry. Formal application should be made by December 15. Applications are evaluated by the Immunology Predoctoral Committee based on scores on the GRE exams (including the subject test in either biology, biochemistry, or chemistry), which should be taken by the October test date; grades; evidence of prior research experience; letters of recommendation, including letters from research sponsor(s); and commitment to a career in biomedical research. Interested Stanford medical students are welcome to apply to the program; they should contact the program director.

Students admitted to the program are offered financial support covering tuition, a living stipend, insurance coverage, and an allowance for books/travel. Applicants are urged to apply for independent fellowships such as from the National Science Foundation and the Howard Hughes Medical Institute. Fellowship applications are due in November of the year prior to matriculation in the graduate program. Because of the small number of department-funded slots, students who have been awarded an outside fellowship will have an improved chance of acceptance into the program.

On matriculation, each student is assisted in selecting courses and lab rotations in the first year and in choosing a lab for the dissertation research. Once a dissertation adviser has been selected, a dissertation committee including at least two Immunology faculty, and including the dissertation adviser, is constituted to guide the student during the dissertation research. The student must meet with the dissertation committee at least once a year.

Candidates for Ph.D. degrees at Stanford must satisfactorily complete a three-year program of study that includes 72 units of graduate course work and research and nine full-tuition quarters of residency. At least 3 units must be taken with each of four different Stanford faculty members.

The requirements for the Ph.D. degree in Immunology include the following:

1. Training in biology and cognate disciplines equivalent to that provided by the undergraduate Biology major at Stanford.
2. Completion of the following courses (or their equivalents from undergraduate work):
   a) Basic immunology (Biological Sciences 230 or Microbiology and Immunology 200)
   b) Advanced Immunology (Immunology 201, 202)
   c) Biochemistry and molecular biology, graduate level (Biochemistry 200)
   d) Cell Biology of Physiological Processes (Molecular and Cellular Physiology 221)
   e) Statistics (Biology 141 or Health Research and Policy 202)
   f) Principles of Biological Technologies (Microbiology/Immunology 215)
   g) Graduate level genetics (Genetics 201)
   h) Responsible Conduct in Science (Medicine 255)
3. First-year students are required to take both the Seminar in Immunology (Immunology 311) and the companion course, Seminar Discussion in Immunology (Immunology 311A). Students in their second year and above must participate in the Seminar in Immunology (Immunology 311) and may opt to take the companion course, Immunology 311A. Students who have not yet achieved TGR status must register for 1 unit. Students attend the weekly Immunology Seminar Series (5-6 p.m. Tuesdays). Students read the papers and have dinner with visiting seminar speakers two or three times each quarter, and meet with a faculty member to discuss the material.
4. Elective courses as agreed upon by the student, adviser, and advisory committee. Electives may be chosen from graduate courses and seminars in any of the biomedical science departments and programs.
5. Completion in the first year of three one-quarter rotations. Two weeks after taking the written portion of the qualifying examination process, students shall present their lab rotation research projects to the Predoctoral Committee and the Immunology community at large.
6. Teaching assistantship in two immunology courses. A teaching assistantship requirement may be fulfilled by proposing a graduate student-initiated course (Immunology 315), Topics in Immunology.
7. For admission to candidacy, completion of two requirements by the end of the Autumn Quarter of the second year: a comprehensive written examination in immunology and related biomedical sciences must be completed satisfactorily by the end of Spring Quarter of the first year. Finally, students must prepare and defend a research proposal on their dissertation research by December 31, the end of Autumn Quarter of their second year. Administration and evaluation of these requirements is the responsibility of the student’s dissertation committee.
8. Participation (through regular attendance and oral presentation) in one of the faculty-sponsored immunology journal clubs for at least the first two years. Students are also expected to attend the graduate students’ journal club, the Tuesday evening immunology seminars, and the annual Stanford Immunology Scientific Conference.
9. Passing of the University oral examination on the dissertation research, which is to be taken only after the student has substantially completed the research. The examination is preceded by a public seminar in which the candidate presents his/her research.
10. Completion of a Ph.D. dissertation, resulting from independent investigation and constituting a contribution to knowledge in the area of immunology.

COURSES

Course work and lab instruction in the Immunology Program conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog.

200. Immunology for Medical Students—(Same as Microbiology and Immunology 200.) Introduces the basic concepts of immunology and the role of the immune system in a variety of diseases, utilizing case presentations of diseases in which the immune system plays a major role (autoimmune diseases, infectious disease, transplantation, immunodeficiency diseases, hypersensitivity reactions, and allergic diseases). Basic concepts of the development and function of the immune system are integrated with case material to illustrate how the immune system causes and prevents a variety of endocrine, renal, dermatologic, neurologic, and musculoskeletal diseases, and how organ and tissue transplantation can be used to restore normal function following destruction of particular organs or tissues by immune or other mechanisms.

3 units, Win (Lewis, Staff)

200A. Problem Solving in Immunology—(Same as Microbiology and Immunology 200A.) Optional recommended companion to 200. Weekly problem sets are based, wherever possible, on case reports and publications drawn from the clinical literature concerning the topics covered in lectures and case presentations during the week. Emphasis is on application of the fundamental concepts of immunology.

1 unit, Win (Lewis, Staff)

201. Advanced Immunology I—(Same as Microbiology and Immunology 211.) For graduate students and advanced undergraduates. Lecture/discussion featuring current problems in immunology. Topics: genetics and structure/function relationships of antibodies, T-cell receptors, MHC antigens; accessory molecules; lymphocyte differentiation and activation; cellular regulation of immune responses; autoimmunity and other problems in clinical immunology. Prerequisites: biochemistry, basic or introductory immunology course, consent of instructor (for undergraduates).

3 units, Win (Garcia, Staff)

202. Advanced Immunology II—(Same as Microbiology and Immunology 212.) Critical readings of the immunological literature and specific areas of immunology. Classic problems and emerging areas are
covered based on primary literature. Student and faculty presentations.
Prerequisite: 201.
3 units, Spr (McDevitt, Staff)

215. Principles of Biological Technologies—(Same as Microbiology and Immunology 215.) The principles underlying predominantly biologically focused technical procedures in biomedical research. Lectures on gel electrophoresis, nucleic acid hybridization, protein purification and stabilization, light microscopy, and computer search algorithms. Prerequisites: biochemistry, organic chemistry, and physics.
2 units, Spr (Kirkegaard)

221. Cell Biology of Physiological Processes—(Same as Biological Sciences 214.) The basic mechanisms of membrane and cellular biogenesis in relation to physiological processes. Emphasis is on the regulatory and signaling mechanisms involved in coordinating complex cellular phenomena, such as cellular organization, function, and differentiation. Topics: cellular compartmentalization, transport and trafficking of macromolecules, organelle biogenesis, cell division, motility and adhesion, and multicellularity. Prerequisites: Biological Science core, Biochemistry 201.
5 units, Win (Kopito, W. Nelson)

230. Introduction to Medicine—For doctoral students. Introduces the information and approaches used by physicians to understand human disease, focusing on a small number of multisystem disorders: type I and type II diabetes mellitus, using lectures/discussion sections, computer demonstrations (including Web resources and disease simulation software), and guided use of Medical School teaching materials and taped lectures in small groups. Student projects of their own choosing involve other multisystem diseases.
3 units, Spr (Mellins, Parnes)

290. Teaching of Immunology—Practical experience in teaching by serving as a teaching assistant in an immunology course.
(Staff)

300. Research—Research for graduate students in the Ph.D. program in Immunology.
1-15 units (Staff)

311. Seminar in Immunology—Enrollment limited to graduate students in the Ph.D. program in Immunology. Current research topics in immunology.
1 unit, Aut, Win, Spr (Mellins)

311A. Seminar Discussion in Immunology—Enrollment limited to graduate students in the Ph.D. program in Immunology, and is required of first-year graduate students. Students read and discuss papers of speakers in the Immunology Seminar Series and meet with the speakers to discuss their research.
1 unit, Aut, Win, Spr (Mellins)

315. Special Topics in Immunology—Graduate student initiated seminar, in journal club style. Previous topics included evolutionary immunology and the principles of vaccine development.
1 unit (Staff)

MICROBIOLOGY AND IMMUNOLOGY

Emeriti: (Professors) Sidney Raffel, Leon T. Rosenberg, John P. Stewart, Bruce A. D. Stocker*; Professor (Research) Esther M. Lederberg
Chair: John Boothroyd

Associate Professors: Yuen-hsiu Chien, Karla Kirkegaard, Garry Nolan
Associate Professor (Teaching): Robert D. Siegel
Assistant Professors: Christopher Garcia, Peter Jackson, David Relman, Julie Theriot

* Recalled to active duty.

The Department of Microbiology and Immunology offers a complete program of training leading to the Ph.D. degree, as well as research training, courses, and seminars for medical students and postdoctoral fellows. Research interests focus on two broad areas, host-parasite interactions, and the function of the immune system. Individual laboratories investigate mechanisms of pathogenesis and the physiology of viruses, bacteria, and protozoan parasites, as well as the lymphocyte function in antigen recognition, immune response, and autoimmunity.

GRADUATE PROGRAMS

MASTER OF SCIENCE

A regular M.S. program is not offered, although this degree is awarded under special circumstances. Candidates for master’s degrees are expected to have completed the preliminary requirements for the B.S. degree, or the equivalent. In addition, the candidate is expected to complete 45 quarter units of work related to microbiology; at least 25 of these units should concern research devoted to a thesis. The thesis must be approved by at least two members of the department faculty.

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. are described in the “Graduate Degrees” section of this bulletin.

Application, Admission, and Financial Aid—Prospective Ph.D. candidates should have completed a bachelor’s degree in a discipline of biology or chemistry, including course work in biochemistry, chemistry, genetics, immunology, microbiology, and molecular biology. The deadline for receipt of applications with all supporting materials is December 15.

Applicants must file a report of scores on the general subject tests and on an advanced test (normally in cellular and molecular biology, chemistry, or biochemistry) of the Graduate Record Examination (GRE). It is strongly recommended that the GRE be taken before October so that scores are available when applications are evaluated.

In the absence of independent fellowship support, entering predoctoral students are fully supported with a stipend and tuition award. Highly qualified applicants may be honored by a nomination for a Stanford fellowship. Successful applicants have been competitive for predoctoral fellowships such as those from the National Science Foundation and Howard Hughes Medical Institute.

Program for Graduate Study—The Ph.D. degree requires course work and independent research demonstrating an individual’s creative, scholastic, and intellectual abilities. On entering the department, students meet an advisory faculty member and together they design a timetable for completion of the degree requirements. Typically, this consists of first identifying gaps in the student’s undergraduate education and determining courses that should be taken. Then, a tentative plan is made for two to four lab rotations (one rotation per quarter). During the first year of graduate study in the department, each student also takes six or seven upper-level (200-series) courses. Two of these courses, Principles of Biotechnologies, and Pathogenesis of Bacteria, Viruses, and Eukaryotic Parasites, are specific requirements of this department, and of Immunology. Three courses, Advanced Genetics, Molecular Biology, and Cell Biology, are part of the “core curriculum” that is required of many graduate students in Stanford Biosciences.

In Winter Quarter of the second year, each student defends orally a formal research proposal on a topic outside the intended thesis project. The outline of this proposal is due to the Graduate Program Steering
interpretation of data. Students give four oral presentations and lead into a detailed literature review on a specific topic. Emphasis is on the primary scientific literature, writing formal summaries, and synthesizing it for emerging infections. Journal club format: students select articles from the core or consent of instructor.

54Q. Stanford Introductory Seminar: Modern Plagues—Preference to sophomores. Resistance of bacteria to antibiotics has reached alarming proportions. From the 1930s to the early 1970s, the discovery of several classes of highly effective antimicrobial agents enabled us to nearly eliminate the threat of bacterial disease. But this situation is drastically changed as a result of widespread antibiotic resistance in bacteria. The causes and potential solutions.

2 units, Aut, Win (Staff)

26Q. Stanford Introductory Seminar: The Threat of Emerging Antibiotic Resistance and What We Can Do About It—Preference to sophomores. Resistance of bacteria to antibiotics has reached alarming proportions. From the 1930s to the early 1970s, the discovery of several classes of highly effective antimicrobial agents enabled us to nearly eliminate the threat of bacterial disease. But this situation is drastically changed as a result of widespread antibiotic resistance in bacteria. The causes and potential solutions.

3-5 units, Spr (Matin)

54Q. Stanford Introductory Seminar: Strategies in Molecular and Cellular Imaging—Preference to sophomores. The tools for studying the molecular basis of disease have been largely limited to methods that require tissue sampling and analysis outside the body. Tools are being developed to reveal the molecular basis of disease in living animal models and in humans. The various imaging modalities that are being used to develop these tools, and the current approaches that are being employed to follow cells, assess gene expression patterns, and evaluate disease processes in vivo. Students use their understanding of biology to design an imaging strategy that uses one imaging modality to address a selected biological question. Prerequisite: one year of college-level biology.

3 units, Spr (Contag)

115A. Humans and Viruses—(Same as Human Biology 115A.) Overview of human virology. Topics illustrate concepts in biology and the social sciences, focusing on emerging infections, viral classification, transmission and prevention, vaccination and treatment, eradication of disease, viral pathogenesis, mechanisms of virally induced cancer, and viral evolution. Topics: molecular biology of genetic shift and drift in influenza virus, cellular tropism of HIV, developmental biology of virally-induced birth defects, clinical aspects of infantile diarrhea, social aspects of the common cold, policy issues of blood-borne tests, factors in pathogenesis and transmission of prions. Prerequisite: Human Biology core or consent of instructor.

4 or 6 units (Siegel) given 2001-02

115B. Seminar: The Vaccine Revolution—(Same as Human Biology 115B.) Advanced seminar. The human aspects of viral disease, focusing on recent discoveries, especially in the area of vaccine development and emerging infections. Journal club format: students select articles from primary scientific literature, write formal summaries, and synthesize it into a detailed literature review on a specific topic. Emphasis is on the development of critical reading, analysis, experimental design, and interpretation of data. Students give four oral presentations and lead discussions based on their scientific journal reading. Enrollment limited to 10. Prerequisite: 115A.

5 units, Spr (Siegel)

185. Topics in Microbiology—In-depth coverage of basic topics: diversity, molecular regulation, growth, bioenergetics, and unique metabolic processes. Student papers on current topics (e.g., antibiotic resistance, molecular approaches to bioremediation) for presentation. Prerequisites: Chemistry 31, 33, 35. Recommended: Biological Sciences 31.

3 units, Win (Matin, Staff)

198A-F. Undergraduate Directed Reading—Prerequisite: consent of instructor.

15 units maximum, any quarter (Staff)

200. Immunology for Medical Students—(Same as Immunology 200.) Introduces the basic concepts of immunology and the role of the immune system in a variety of diseases, utilizing case presentations of diseases in which the immune system plays a major role (autoimmune diseases, infectious disease, transplantation, immunodeficiency diseases, hypersensitivity reactions, and allergic diseases). Basic concepts of the development and function of the immune system are integrated with case material to illustrate how the immune system causes and prevents a variety of endocrine, renal, dermatologic, neurologic, and musculoskeletal diseases, and how organ and tissue transplantation can be used to restore normal function following destruction of particular organs or tissues by immune or other mechanisms.

3 units, Win (Lewis, Staff)

200A. Problem Solving in Immunology—(Same as Immunology 200A.) Optional; complements 200. Weekly problem sets based, wherever possible, on case reports and publications drawn from the clinical literature concerning the topics covered in lectures and case presentations during the week. Emphasis is on application of the fundamental concepts of immunology to the clinical problems under consideration.

1 unit, Win (Lewis, Staff)

201. Infectious Basis of Disease—Presentation of the spectrum of human illness induced by viruses, bacteria, fungi, and medical parasites, including protozoans and helminths. Classification, epidemiology, transmission, pathogenesis, diagnosis, treatment, control, vaccination, and other preventive measures. Emphasis is on the syndromic approach to disease. Lectures, demonstrations, lab sessions, and small group evaluation of clinical correlates. Use of interactive multimedia instructional program, MICROBE, CWP, and labs. Prerequisite: medical student status.

9 units, Aut (Siegel, Staff)

203. Biological Stress Response—In-depth coverage of current literature, with student participation. Possible topics: the nature and molecular regulation of the stress response; biochemistry and structural biology of molecular chaperones; the role of stress proteins in the pathogenic process; psychoneuroendocrinology; multidrug resistance. Enrollment limited. Prerequisites: Biological Sciences core, upper-division course in molecular biology/genetics or biochemistry.

3 units (Matin, Staff) alternate years, given 2001-02


3 units (Mocarski, Kirkegaard, Sarnow) not given 2000-01

208. Topics in Virology—Informal advanced seminar in a topical area of the molecular biology of viruses. Student participation in presenta-
210. Pathogenesis of Bacteria, Viruses, and Eukaryotic Parasites—
For graduate, medical, and advanced undergraduate students. Required
of first-year graduate students in Microbiology and Immunology. Emphasis
is on understanding the molecular mechanisms by which micro-
organisms invade animal and human hosts, express their genomes,
interact with macromolecular pathways in the infected host, and induce
disease. Problem sets and recent literature pertaining to microbial patho-
genesis. Prerequisite: understanding of biochemistry and molecular
biology.

4 units, Win, Spr (Sarnow, Boothroyd, Kirkegaard, Mocarski,
Relman, Falkow, Theriot)

211. Advanced Immunology—(Same as Immunology 201.) For grad-
uate students and advanced undergraduates. Lecture/discussion feature-
ing current problems in immunology. Topics: genetics and structure/
function relationships of antibodies, T-cell receptors, MHC antigens;
accessory molecules; lymphocyte differentiation and activation; cellular
regulation of immune responses; autoimmunity and other problems in
clinical immunology. Prerequisites: biochemistry, basic or introductory
immunology course, consent of instructor (for undergraduates).
3 units, Win (Garcia, Staff)

212. Advanced Immunology—(Same as Immunology 202.) Critical
readings of the immunological literature and specific areas of immunol-
y. Classic problems and emerging areas are covered based on primary
literature. Student and faculty presentations. Prerequisite: 211.
3 units, Spr (McDevitt, Staff)

215. Principles of Biological Technologies—(Same as Immunology
215.) Required of first-year graduate students in Microbiology and
Immunology. The principles underlying commonly utilized technical
procedures in biological research. Lectures on gel electrophoresis, nucle-
acid hybridization, protein purification and stabilization, light micros-
copy and computer search algorithms for protein and nucleic acid
databases. Prerequisites: biochemistry, organic chemistry, and physics.
2 units, Spr (Kirkegaard)

299. Directed Reading—Prerequisite: consent of instructor.
18 units maximum, any quarter (Staff)

399. Graduate Research—Students who have satisfactorily completed
the necessary foundation courses may elect research work in general
bacteriology, bacterial physiology and ecology, bacterial genetics, mi-
crobial pathogenicity, immunology, parasitology, and virology.
18 units maximum, any quarter (Kirkegaard)

459. Frontiers in Interdisciplinary Biosciences—(Cross-listed in
multiple departments in the schools of Humanities and Sciences, Engi-
neering, and Medicine; students should enroll directly through their
affiliated department, if at all possible.) Introduction to cutting-edge
research involving interdisciplinary approaches to biocience and bio-
technology; for specialists and non-specialists. Associated with Stan-
ford’s Clark Center for Interdisciplinary Bioscience, and held in con-
junction with a seminar series meeting twice monthly during 2000-01.
Leading investigators from Stanford and throughout the world speak on
their research; students also meet separately to present and discuss the
ever-changing subject matter, related literature, and future directions.
Prerequisite: keen interest in all of science, with particular interest in life
itself. Recommended: basic knowledge of biology, chemistry, and
physics.
2 units, Aut, Win, Spr (S. Block)
knowledge of relevant physiology is also tested orally at a separate examination. The examinations may be taken only after all course work has been completed by the required standard. Students undertake individual research studies as early as possible after consultation with their preceptor. Upon passing this exam, the student is advanced to candidacy for the Ph.D.

Dissertation and University Oral Examination—The results of independent, original work by the students are presented in a dissertation. The oral examination is largely a defense of the dissertation.

Advisers and Advisory Committees—A graduate advisory committee, currently Professors Madison, Schwarz, and Smith, advises students during the period before the formation of their qualifying committees.

Financial Aid—Students may be funded by their advisers’ research grants, by future training grants, by department funds, or by extramural funds. Students are encouraged to obtain funding from outside sources (for example, NIH, NSF, Hughes, and so on).

COURSES

Course work and lab instruction in the Department of Molecular and Cellular Physiology conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog.

199. Undergraduate Research—Investigation sponsored by individual faculty members, available to undergraduates, hours and units arranged. Fields of research open to students are decided in consultation with sponsoring faculty member.

200. Physiology: Cardiovascular—Offered jointly with the Department of Medicine. Lectures, small group instruction, clinical presentations, and lab demonstrations of normal and disordered human cardiovascular physiology. Prerequisite: understanding of general biochemistry.

201. Physiology: Endocrine—Offered jointly with the Department of Medicine. Lectures, clinical presentations, and demonstrations on normal and disordered function in the endocrine system. Prerequisite: understanding of general biochemistry.

202, 203, 204. Physiology: 202-Gastrointestinal; 203-Renal; 204-Respiratory—Offered jointly with the Department of Medicine. Lectures, clinical presentations, and demonstrations on normal and disordered function in the respiratory, renal, fluid and electrolyte, and acid-base systems. Prerequisite: understanding of general biochemistry.

206. Pathophysiology—Offered jointly with the Department of Medicine. The physiology of disease, emphasizing clinical situations where two or more organ systems come together at the molecular, cellular, and organ level. The physiology of individual organ systems and the genetics and physiology of diseases such as cystic fibrosis, muscular dystrophy, and hypertension.

210. Principles of Cell Physiology—Required for all MCP graduate students; open to graduate, medical, and advanced undergraduate students (with consent of instructor). Examines the basic biophysical principles that govern cell physiology and applies these principles to aid in understanding a wide range of physiological processes. Energy transduction, diffusion, membrane properties, and electrical potentials and gradients are discussed and related to current problems in ion and electrical signaling, solute and solvent transport and cellular homeostasis. Lecture/discussions introduce basic concepts; students use these principles to solve specific physiological problems.

213. Special Topics in Molecular and Cellular Physiology—Seminar of guided reading/discussion in introductory and advanced physiological topics agreed on by an individual instructor and interested students. Prerequisite: consent of instructor.

215. Synaptic Transmission—Primarily for graduate students with an interest in synaptic function; interested medical students and advanced undergraduates may enroll. The anatomical, physiological, and biochemical basis of synaptic function in the peripheral and central nervous system. Lectures and discussions of relevant research papers.

216. Ion Channels and Membrane Physiology—(Same as Neurobiology 216.) For students with some background in neurobiology who wish to learn the basic mechanisms of signaling in nerve cells. Reading/discussion of original research papers, emphasizing concepts, quantitative analysis of experimental results, and critical evaluation of evidence. Topics: gating mechanisms in voltage sensitive and chemosensitive ion channels and ionic mechanisms in sensory transduction. Student presentations and small group discussions.

221. Cell Biology of Physiological Processes—(Same as Biological Sciences 214.) The basic mechanisms of membrane and cellular biogenesis in relation to physiological processes. Emphasis is on the regulatory and signaling mechanisms involved in coordinating complex cellular phenomena, such as cellular organization, function, and differentiation. Topics: cellular compartmentalization, transport and trafficking of macromolecules, organelle biogenesis, cell division, motility and adhesion, and multicellularity. Must be taken concurrently with 214A-H. Prerequisites: Biological Sciences core, Biochemistry 201.

222. Imaging: Biological Light Microscopy—Survey of instruments which use light and other radiation for analysis of cells in biological and medical research. Topics: basic light microscopy through confocal fluorescence and video/digital image processing. Lectures on physical principles; involves partial assembly and extensive use of lab instruments. Lab. Prerequisites: some college physics, Biological Sciences core.

Molecular Pharmacology

Emeriti: (Professors) Robert H. Dreisbach, Avram Goldstein, Dora B. Goldstein, Tag E. Mansour

MOLECULAR PHARMACOLOGY
Chair: Helen M. Blau
Professors: Terrence Blaschke (jointly with Medicine), Helen M. Blau,
Oleg Jardetzky, Richard A. Roth, James P. Whitlock, Jr.
Associate Professors: James E. Ferrell, Jr., Phyllis Gardner (jointly with Medicine), Tobias Meyer, Garry P. Nolan, Daria Mochly-Rosen
Assistant Professor: Karlene A. Cimprich
Associate Professor (Teaching): Ellen Porzig
Consulting Professors: Gordon Ringold, Alejandro Zaffaroni

GRADUATE PROGRAMS

MASTERS OF SCIENCE

Students in the Ph.D. program may apply for an M.S. degree, after having satisfactorily completed the course and laboratory requirements of the first two years. The degree also requires a written thesis based on literature or laboratory research. Postdoctoral research training is available to graduates having the Ph.D. or M.D. degree.

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. are described in the “Graduate Degrees” section of this bulletin.

The Department of Molecular Pharmacology offers interdisciplinary training to prepare students for independent careers in biomedical science. Research and training in the department focuses on the mechanisms by which hormones, drugs, and toxic compounds alter cell function, and on the development of new therapeutic technologies. At the heart of these issues lies the analysis of cell signaling and gene expression.

The program leading to the Ph.D. degree includes formal and informal study in pharmacology, genetics, biochemistry, and molecular cellular biology. First-year students spend one quarter in each of three different laboratories, working closely with other graduate students, a professor, and postdoctoral fellows on various research projects. During the fourth quarter, the student chooses a faculty mentor with whom to undertake thesis research, based on available positions and the student’s interest. During or before the eighth quarter of study, students must pass a qualifying exam which consists of an oral exam on general knowledge and a defense of a research proposal. Course requirements are fulfilled during the first two years of study; the later years of the four- to six-year program are devoted to full-time dissertation research. Close tutorial contact between students and faculty is stressed throughout the program.

Research opportunities also exist for medical students and a limited number of undergraduate students. The limited size of the labs in the department allows for close tutorial contact between students, postdoctoral fellows, and faculty.

The department presents two basic courses in medical pharmacology (201 and 202) and advanced courses open to qualified medical and other graduate students. Consult the Time Schedule for additional advanced courses.

COURSES

Course work and lab instruction in the Department of Molecular Pharmacology conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog.

BASIC

201 and 202 provide a broad exposure to the principles of pharmacology and the properties of the major drug groups.

201. Pharmacology—Topics: receptors; pharmacokinetics; and autonomic, CNS, and cardiovascular pharmacology. Emphasis is on the mechanisms of drug action in humans. Prerequisite: biochemistry.
   5 units, Aut (Staff)

   5 units, Win (Staff)

ADVANCED

Open to all University students; instructor’s consent required prior to registration. These courses require a good knowledge of physiology and biochemistry and sometimes of microbiology or genetics. Students should consult with the instructor about the adequacy of their preparation.

210. Cell Signaling—Provides a basic core of information on the molecular mechanisms through which cells receive and respond to external signals. Emphasis is on the principles of cell signaling and experimental strategies through which cell signaling pathways are being elucidated. Two didactic lectures, one research seminar, and one discussion section weekly. Prerequisites: a working knowledge of biochemistry and genetics.
   4 units, Win (Ferrell, Meyer, Simon, Staff)

231. Molecular Biology of Gene Therapy—Cell mediated gene therapy as a novel form of drug delivery. Vectors, cell types, and relevant genetic and acquired diseases are discussed in a series of lectures, and in student and guest presentations. Prerequisites: biochemistry and molecular biology.
   2-3 units, Spr (Nolan, Blau) alternate years, not given 2001-02

240. Drug Discovery—The scientific principles and technologies involved in making the transition from basic biological observation to the creation of a new drug, with emphasis on molecular and genetic issues.
   4 units (Mochly-Rosen, Cimprich) alternate years, given 2001-02

250. Fundamentals of Drug-Receptor Interactions and Drug Design—For the student of molecular biology and molecular pharmacology who wants to understand the principles of biological structure determination, scope, and the limits of the methods at our disposal, and of the structural information derived from them.
   3 units, Aut (Jardetzky) alternate years, not given 2001-02

251. Aging: Health and Disease—Open to graduate students and medical students. Interdisciplinary. The psycho-social aspects of aging: health policy considerations of geriatric medicine, changes in cognition and reproductive potential, effects of exercise and nutrition, cultural perspectives on aging and medical ethical issues including social and family support of aging patients. The cellular and molecular basis of aging: life span and animal models for aging, genetics of aging, aging syndromes, nuclear clocks, senescence and telomers, and non-disjunction in gametogenesis. Future approaches to novel treatments for the diseases of aging: Parkinsons, Alzheimers, cardiovascular illnesses, cancer, arthritis, and osteoporosis. Aging is evaluated as a normal developmental process, focusing on its effects on human reproductive, skeletal, hematopoetic, and nervous systems.
   3 units (Staff) alternate years, given 2001-02

270. Research Seminar—Weekly seminars on current research in pharmacology. Seminars are reviewed and discussed in a separate conference with a member of the faculty.
   2 units, Aut, Win, Spr (Staff)

280. Tutorial Program—Primarily for graduate students in pharmacology. Guided readings in the literature of any area of pharmacology. A critical review paper may be required.
   3 units (Staff)

299. Directed Reading
   any quarter (Staff)

399. Research
   any quarter (Staff)

459. Frontiers in Interdisciplinary Biosciences—(Cross-listed in multiple departments in the schools of Humanities and Sciences, Engi-
neurobiology, and Medicine; students should enroll directly through their affiliated department, if at all possible.) Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford's Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

2 units, Aut, Win, Spr (S. Block)

NEUROBIOLOGY

Chair: Howard Schulman
Professors: Denis A. Baylor, Eric I. Knudsen, Uel J. McMahan, William T. Newsome, Howard Schulman, Eric M. Shooter, Lubert Stryer
Associate Professor: Ben Barres
Assistant Professor: Jennifer Raymond
Visiting Assistant Professor: Kajiwara Kazuto

GRADUATE PROGRAM

Graduate students in the Department of Neurobiology obtain the Ph.D. degree through the interdepartmental Neurosciences Ph.D. program. Accepted students receive funding for tuition and a living stipend. Applicants should familiarize themselves with the research interests of the faculty and, if possible, indicate their preference on the application form which is submitted directly to the Neurosciences Program.

Medical students also are encouraged to enroll in the Ph.D. program. The requirements of the Ph.D. program are fitted to the individual interests and time schedules of the student. Postdoctoral training is available to graduates holding Ph.D. or M.D. degrees, and further information is obtained directly from the faculty member concerned.

Research interests of the department include: mechanisms of visual transduction and information transmission in vertebrate retina; structure, function, and development of auditory and visual systems; integrative mechanisms and regeneration in the central and peripheral nervous system; mechanisms of ion channel function; and neuronal growth and differentiation.

COURSES

Course work and lab instruction in the Department of Neurobiology conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog.

The department offers a one-quarter course (Neurobiology 200) on the structure and function of the nervous system, which is open to medical and graduate students, and advanced undergraduates. Advanced courses are open to students who have completed the basic course.

199. Directed Reading (Undergraduate)—Prerequisite: consent of instructor.
1-18 units, any quarter (Staff)

200. The Nervous System—Introduction to the structure and function of the nervous system, including neuroanatomy, neuropathology, and neurochemistry. Topics range from the properties of neurons to the interplay of receptors, enzymes, and ion channels mediating these processes. Experimental approaches include gene cloning and site-specific mutagenesis, isolation and reconstitution of functional transducing assemblies, and patch clamping and other electrophysiological methods. Emphasis is on recurring motifs of excitation and adaptation, and transduction and their evolution.
4 units (Stryer) alternate years, given 2001-02

218. Neural Basis of Behavior—Advanced seminar exploring the principles of information processing by the central nervous system of vertebrates, and the relationship of functional properties of neural systems with perception and behavior. Emphasis is on the visual and auditory systems. Study of original papers, directed group discussions, and student presentations. Prerequisite: Neurobiology 200 or consent of instructor.
4 units, Spr (Knudsen, Newsome) alternate years, not given 2001-02

230. Signal Transduction Mechanisms—Molecular mechanisms of the transduction of sensory and hormonal stimuli by prokaryotes and eukaryotes. Topics: bacterial chemotaxis and phototaxis; vision in invertebrates and vertebrates; olfaction; and hormonal actions mediated by G-proteins, e.g., adenylate cyclase cascade and the phosphoinositide cascade; molecular evolution of transducing proteins. The structure and interplay of receptors, enzymes, and ion channels mediating these processes. Experimental approaches include gene cloning and site-specific mutagenesis, isolation and reconstitution of functional transducing assemblies, and patch clamping and other electrophysiological methods. Emphasis is on recurring motifs of excitation and adaptation, and transduction and their evolution.
4 units (Stryer) alternate years, given 2001-02

254. Molecular and Cellular Neurobiology—(Same as Biological Sciences 154/254.) Lecture/seminar for advanced undergraduates and graduate students, focusing on cellular and molecular mechanisms in the organization and functions of the nervous system. Topics: cell biology of the neuron, wiring of the neuronal network, synaptic structure and synaptic transmission, signal transduction in the nervous system, the molecular basis of behavior including learning and memory, and the molecular pathogenesis of neurological diseases. Prerequisite for undergraduates: Biological Sciences core or equivalent, plus at least one of 118, 119, 128, 129, or 153, or consent of the instructors.
4 units, Aut (Luo, Schulman)

299. Directed Reading—Prerequisite: consent of instructor.
1-18 units, any quarter (Staff)

300. Professional Development and Integrity in Neuroscience—Required of Neurosciences Ph.D. students every quarter. Develops professional skills in critical assessment and oral presentation of findings from current neuroscience literature in the visual presentation of quantitative data and writing research grants. The role of animals in lab research, fraud in science, the responsibility of authors and reviewers, science in a multicultural environment, and the relationship between student and mentor. Student and faculty presentations and discussions.
2 units, Aut, Win, Spr (Schulman)

399. Individual Research—Prerequisite: consent of instructor.
1-18 units, any quarter (Staff)

NEUROSCIENCES PROGRAM

Director: Eric I. Knudsen (Professor of Neurobiology)

Participating Faculty:
Anesthesia: Rona Giffard (Associate Professor), Joan E. Kendig (Professor), M. Bruce Maclver (Assistant Professor, Research), Mervyn Maze (Professor)
Biological Sciences: Bruce Baker (Professor), William F. Gilly (Professor), H. Craig Heller (Professor), Ron Kopito (Professor), Liqun Luo (Assistant Professor), Susan McConnell (Professor), Robert M. Sapolsky (Professor), Stuart Thompson (Professor)
Developmental Biology: Matthew P. Scott (Professor)
Genetics: David R. Cox (Professor)
Molecular and Cellular Physiology: Richard Aldrich (Professor), Brian Kobilka (Associate Professor), Richard S. Lewis (Associate Professor), V. Daniel Madison (Associate Professor), Richard H. Scheller (Professor), Thomas Schwarz (Associate Professor), Stephen Smith (Professor), Richard Tsien (Professor)
Molecular Pharmacology: Helen Blau (Professor), Daria Mochly-Rosen (Associate Professor)
Neurobiology: Ben Barres (Associate Professor), Denis A. Baylor (Professor), Eric I. Knudsen (Professor), U. J. McMahan (Professor), William T. Newsome (Professor), Jennifer Raymond (Assistant Professor), Howard Schulman (Professor), Eric M. Shooter (Professor), Lubert Stryer (Professor)
Neurology and Neurological Sciences: John A. Huguenard (Associate Professor, Research), William C. Mobley (Professor), David A. Prince (Professor), Thomas A. Rando (Assistant Professor), Lawrence Steinman (Professor)
Neurosurgery: Gary K. Steinberg (Professor)
Pathology: Lawrence F. Eng (Professor, Research)
Psychiatry and Behavioral Sciences: William C. Dement (Professor), Judith Ford (Associate Professor, Research), Terrence A. Ketter (Associate Professor), Edith Sullivan (Associate Professor, Research)
Psychology: Russell D. Fernald (Professor), John Gabrieli (Associate Professor), David Heeger (Associate Professor), Brian Wandell (Professor), Jeffrey J. Wine (Professor)

GRADUATE PROGRAM

DOCTOR OF PHILOSOPHY

University requirements for the Ph.D. are described in the "Graduate Degrees" section of this bulletin. The interdepartmental Neurosciences Program offers instruction and research opportunities leading to a Ph.D. in Neurosciences. The requirements for a Ph.D. degree follow those of the University and in addition are tailored to fit the background and interests of the student. Accepted students receive an award covering tuition, a basic health plan, and a living stipend. Qualified applicants should, where possible, apply for the predoctoral fellowships in open competition, especially those from the National Science Foundation and the Howard Hughes Medical Institute.

Applicants should familiarize themselves with the research interests of the faculty and indicate their preferences clearly on the application form.

Since students enter with differing backgrounds and the labs in which they may elect to work cover several different disciplines, the specific program for each student is developed individually with an advisory committee. All students are required to complete the basic courses in neurobiology (Neurobiology 200 or its equivalent). Students are also required to take at least five advanced neuroscience courses. At least one course must be taken from each of the following categories: Clinical Neurosciences, Developmental Neuroscience, Integrative and Behavioral Neurosciences, Membrane Excitability; and one course in either Computational Neuroscience or Neuronal Communication.

Students usually rotate through several labs during their first year, although they may choose to begin thesis research on entry. After the first rotation, students may rotate both within and outside the Neurosciences Program. Required course work should be completed by the end of the second year. Passing of a comprehensive oral preliminary examination given by the student's advisory committee is required for admission to Ph.D. candidacy. This examination is usually taken by the end of the second year. The student is required to present a Ph.D. dissertation which is the result of independent investigation contributing to knowledge in an area of neuroscience and to defend his or her dissertation in a University oral examination, which includes a public seminar.

Medical students may participate in this program provided they meet the prerequisites and satisfy all the requirements of the graduate program as listed above. The timing of the program may be adjusted to fit their special circumstances.

COURSES

Course work and lab instruction in the Neurosciences Program conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog.

The following courses fulfill program requirements. Consult the course selection of individual departments for complete descriptions.

399. Research—Prerequisite: consent of instructor.
1-18 units, any quarter (Staff)

BIOLOGICAL SCIENCES

258. Neural Development
4 units, Spr (McConnell) alternate years, not given 2001-02

MOLECULAR AND CELLULAR PHYSIOLOGY

215. Synaptic Transmission
5 units (Smith, Schwarz, Madison) alternate years, given 2001-02

NEUROBIOLOGY

200. The Nervous System
9 units, Win (Barres, Baylor, Knudsen, McMahan, Newsome, Raymond, Schulman, Shooter, Stryer)

218. Neural Basis of Behavior
4 units, Spr (Knudsen, Newsome) alternate years, not given 2001-02

230. Signal Transduction Mechanisms
4 units (Stryer) not given 2000-01

254. Molecular and Cellular Neurobiology
4 units, Aut (L. Luo, H. Schulman)

300. Professional Development and Integrity in Neuroscience
2 units, Aut, Win, Spr (Schulman)

NEUROLOGY AND NEUROLOGICAL SCIENCES

205. Clinical Neuroscience
2 units, Win (Huguenard)

PSYCHOLOGY

206. Behavioral Neuroscience
1-3 units, Spr (Wandell, Wine) alternate years, not given 2001-02

276. Computational Neuroscience
1-3 units (Heeger) alternate years, given 2001-02

PATHOLOGY

Emeritus: (Professors) Margaret E.Billingham, Ronald F. Dorfman, Lysia K. Forno, David Glick, David Korn; (Clinical Assistant Professor) Charles T. Uyeda

Chair: Stephen J. Galli


Associate Professors: Ellen Jo Baron, Gerald J. Berry, Peter Jackson, Sabine Kohler, Arend Sidow, J. Matthijs van de Rijn
215. Molecular Mechanisms of Disease—Provides graduate students in the basic sciences with an exposure to current research topics in human disease. Each week, one scientist from academia or industry presents a seminar on the pathogenesis of a particular disease, with an emphasis on molecular approaches, followed by a discussion. A review article and one or two research papers from the current literature are assigned prior to each meeting.

1 unit, Win (D. Regula, K. Bensch, Staff)

230A, B, C. General and Special Pathology—Three-quarter introduction to principles in general pathology and a detailed pathology of human disease based on the disordered structure and function of individual organ systems (special pathology). Lecture and lab discussion groups. Course director: Regula.

230A. General and Special Pathology
   6 units, Spr (Regula, Rouse, Staff)

230B. Special Pathology
   6 units, Aut (Regula, Lombard, Staff)

230C. Special Pathology
   6 units, Win (Regula, Hendrickson, Horoupian, Staff)

290. Research in Experimental Neuropathology—Introduction to research methods in experimental neuropathology for students interested in a long-term project in this area. Participation in research is under the close supervision of a staff member in neuropathology. Facilities available include electron microscopy, tissue culture, neurochemistry, and immunocytochemistry with antibody and molecular probes. Prerequisite: consent of instructor.

1-18 units, Spr (Eng, Forno)

292. DNA Repair and Mutagenesis—(Enroll in Biological Sciences 205.)
   3 units, Spr (Hanawalt)

299. Directed Reading—Prerequisite: consent of faculty member.
   1-18 units, any quarter (Staff)

399. Research—Department faculty are involved in active research programs at the Stanford Medical Center. Students interested in research at the molecular, cellular, and clinical-pathologic levels are encouraged to seek out faculty advisers. The department is equipped for modern research and maintains an active and vigorous postdoctoral research training program. Prerequisite: consent of the instructor.

1-18 units, any quarter (Staff)

RADIATION ONCOLOGY

Emeritus: Malcolm A. Bagshaw, Peter Fessenden, George M. Hahn, Robert F. Kallman, Clarence J. Karzmark, Kendric Smith

Chair: Richard T. Hoppe


Associate Professors: Amato J. Giaccia, Susan J. Knox, Gary Luxton

Assistant Professors: Iris C. Gibbs, Christopher R. King, Quynh-Thu Le, Todd Pawliwki, Melanie C. Smit

Associate Professor (Research): Chang-ming Mai

Assistant Professors (Research): Cordula Kirchgessner, Lei Xing

Courtesy Professor: John R. Adler, Jr.

Consulting Professor: Robert M. Sutherland
Radiation Oncology is a discipline focused around the use of radiation for both cancer therapy and research. The fundamental and applied research within the department reflects this spectrum in radiation therapy and clinical oncology, and in radiation and tumor biology.

The department does not offer degrees; however, its faculty teach a variety of courses open to medical students, graduate students, and undergraduates. The department also accepts students in other curricula as advisees for study and research. Graduate students in the Biophysics Program and in the Cancer Biology Program may perform their thesis research in the department. Undergraduate students may also arrange individual research projects under the supervision of the faculty.

At the present time, the major areas of basic research investigation in the department include: DNA repair in mammalian cells after ionizing irradiation; studies of the mechanism of tumor hypoxia in animal tumors; development of new anti-cancer drugs to exploit tumor hypoxia; cytogenetic and molecular methods of predicting the sensitivity of individual tumors to cancer therapy; radionuclide monoclonal antibodies for cancer detection and treatment; studies of oxygen levels in human tumors using polarographic electrodes—clinical trials of a new hypoxic cytotoxic agent (tirapazamine); studies of the late effects of cancer therapy; and techniques of conformal and intensity modulated radiation therapy.

**COURSES**

Course work and lab instruction in the Department of Radiation Oncology conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog. The following are open to undergraduate and postgraduate students.

101. Selected Readings in Radiation Biology  
*Aut, Win, Spr (Staff)*

202. The Basic Science of Radiation Therapy—Primarily for residents or fellows in the Radiation Therapy division training program; open to medical or graduate students. Focus is on the basic biological processes underlying the treatment of malignant disease by radiation. Prerequisites: some familiarity with cell biology and physiology, and consent of instructor.  
1 unit, *Aut, Win, Spr (Brown)*

3 units (Staff) alternate years, given 2001-02

299. Research  
*any quarter (Staff)*

**RADIOLOGY**

Chair: Gary M. Glazer  
Associate Professors: A. Gabrielle Bergman, Robyn L. Birdwell, Michael D. Dake, Debra M. Ikada, Ann Leung, King C. P. Li, Michael Marks, Robert E. Mindell, Michael E. Moseley, Sandy A. Napel, Matilde Nino-Murcia, Eric Olcott, Geoffrey D. Rubin, George M. Segall, Charles P. Semba, Daniel M. Spielman  
Assistant Professors: Christopher F. Beaulieu, Francis Blankenberg, Frandics Chan, Bruce Daniel, Huy M. Do, Garry E. Gold, Stephen Kee, Philipp Lang, Mahmood Razavi, Daniel Y. Sze  
Assistant Professors (Research): Mark Bednarski, R. Kim Butts, Sylvia Plevritis

Visiting Professor: Frode Larum  
Visiting Assistant Professors: Douglas Baker, Hiroshi Yoshioka

The Department of Radiology does not offer degrees; however, its faculty teach a variety of courses open to medical students, graduate students, and undergraduates. The department also accepts students in other curricula as advisees for study and research. Undergraduate students may also arrange individual research projects under the supervision of the department’s faculty.

This discipline focuses on the use of radiation, ultrasound, and magnetic resonance as diagnostic, therapeutic, and research tools. The fundamental and applied research within the department reflects this broad spectrum as it relates to anatomy, pathology, physiology, and interventional procedures. Original research and development of new clinical applications in medical imaging is supported within the Radiological Sciences Laboratory.

Courses open to undergraduate and postgraduate students are listed below.

**COURSES**

101. Selected Readings in Radiation Research  
*Aut, Win, Spr (Staff)*

208. Experimental Nuclear Medicine—Computer applications in medicine, particularly the use of radioisotopes as tracers. Recommended: some knowledge of physiology and calculus.  
*Spr (Strauss)*

299. Research  
*any quarter (Staff)*

**STRUCTURAL BIOLOGY**

Chair: Michael Levitt  
Associate Chair: Joseph D. Puglisi  
Professors: Roger D. Kornberg, Michael Levitt, David B. McKay, Peter Parham  
Associate Professors: Joseph D. Puglisi, William Weis  
Professor (Teaching): Patricia Cross  
Assistant Professor: Kenan C. Garcia  
Courtesy Assistant Professor: Peter Kuhn

The department offers opportunities for course work and research in cell biology. Courses fall into two categories: (1) a series of one-quarter courses that treat special topics of current interest in cell biology at an advanced level; and (2) Structure of Cells and Tissues (211), a one-quarter course tailored to the needs of medical students that includes both lectures on structure-function relationships of mammalian cells and tissues and a lab on medical histology.

The emphasis of research in the department is on understanding fundamental cellular processes in terms of the structure and function of organelles and molecular assemblies. Techniques used include standard methods of biochemistry, cell culture, fluorescence microscopy, genetic engineering, and image processing and three-dimensional reconstruction from electron micrographs, microinjection of cells and nuclei, nanosecond fluorescence spectroscopy, and x-ray and electron diffraction. The department owns and operates a computing center equipped with advanced time-sharing and color graphics systems for data analysis and molecular modeling.

**GRADUATE PROGRAMS**

**DOCTOR OF PHILOSOPHY**

University requirements for the Ph.D. are described in the "Graduate Degrees" section of this bulletin.
The graduate program in Structural Biology leads to the Ph.D. degree. The department also participates in the Medical Scientists Training Program in which individuals are candidates for both the Ph.D. and M.D. degrees.

The graduate program is intended to prepare students for careers as independent investigators in cell and molecular biology. The principal requirement of a Ph.D. degree is the completion of research constituting an original and significant contribution to the advancement of knowledge. In addition, students are required to enroll in the series of special topics courses taught by the faculty of the department. Finally, students gain teaching experience by assisting in the one-quarter courses offered by all faculty in the department.

Applicants to the program should have a bachelor's degree and should have completed at least a year of course work in biology, mathematics, organic chemistry, physical chemistry, and physics. Application forms must be received by the department before January 1 for notification by April 15. Application to the National Science Foundation for fellowship support is also encouraged. Remission of fees and a personal stipend are available to graduate students in the department. Prospective applicants should write to the Department of Structural Biology for further information.

Current topics of research in the department lie in the areas of gene expression; theoretical, crystallographic, and genetic analysis of protein structure; and cell–cell interaction.


COURSES

Course work and lab instruction in the Department of Structural Biology conform to the Policy on the Use of Vertebrate Animals in Teaching Activities as stated in the front of this catalog.

211. Structure of Cells and Tissues—The structural organization of tissues in relation to their function. Topics: light and electron microscopy, epithelia, muscle, connective tissue, bone and cartilage, blood, cardiovascular system, lymphoid tissue, nervous tissue, skin, endocrine, exocrine, gastrointestinal, respiratory, urinary, female and male genital systems, and the ear and eye. Three lectures, two labs, and one review session per week.

7 units, Aut (Cross, Staff)

228. Protein and Nucleic Acid Structure, Dynamics, and Engineering—The availability of three-dimensional atomic structures of proteins and nucleic acids allows interpretation of biological processes based on the physical and chemical properties of these molecules. Crystallographic studies include structural themes exemplified by local chain conformation, secondary structure, domains, families of folds, protein folding, and thermodynamic stability. How these structures move is considered by combining the results of experiments with theoretical molecular dynamics simulations: enzyme catalysis. Novel molecules are engineered from the experimental and predictive aspects, using interactive computer graphics programs to illustrate problems. Systems include protein-nucleic acid complexes and antibody-antigen interactions. Prerequisites: knowledge of basic biochemistry and cell biology.

3 units, Win (Levitt)

229. The Eukaryote Chromosome—The principles of chromosome structure and function. Topics: structure, dynamics, and topological forms of DNA; units and hierarchies of DNA coiling in chromosomes; centromeres, telomeres, and the basis of chromosome maintenance and sorting in mitosis; the mechanism of gene activation with regard to enhancer, promoter, and terminator sequences; the basis of sequence-specific protein-DNA interaction; organization and assembly of the cell nucleus. Prerequisites: knowledge of basic biochemistry and cell biology.

3 units, Spr (Kornberg)

450. Introduction to Biotechnology—(Same as Biochemistry 450, Chemical Engineering 450, Civil and Environmental Engineering 450, Developmental Biology 450.) Faculty from the departments of Biochemistry, Biological Sciences, Chemical Engineering, Civil and Environmental Engineering, Developmental Biology, Structural Biology, and invited industrial speakers review the interrelated elements of modern biotechnology. Topics: protein structure and dynamics, protein engineering, biocatalysis, gene expression, cellular metabolism and metabolic engineering, fermentation technology, and purification of biomolecules. Prerequisite: graduate student or upper-division undergraduate in the sciences or engineering.

3 units, Spr (Robertson, Swartz)

241. Biological Macromolecules—The molecular principles of protein and nucleic acid structures. The forces that stabilize biopolymers are presented with the goal of understanding three-dimensional structures and their functional implications. Topics: protein folding, domain structures, enzyme active sites, DNA and RNA structure, and protein-nucleic acid complexes.

3 units, Aut (Aldrich, Ferrell, Herschlag, Lewis, Puglisi, Weis)

242. Methods in Molecular Biophysics—(Same as Biochemistry 242.) Introduces students from diverse backgrounds to the potential utility of physical approaches to research and helps prepare them to evaluate literature that incorporates these methods. Experimental methods in molecular biophysics are from a theoretical and practical standpoint. Emphasis is on x-ray diffraction and nuclear and nuclear magnetic resonance spectroscopy. Fluorescence spectroscopy, circular dichroism, calorimetry, separation methods.

3 units, Win (Harbury, McKay, Puglisi, Weis)

459. Frontiers in Interdisciplinary Biosciences—(Cross-listed in multiple departments in the schools of Humanities and Sciences, Engineering, and Medicine; students should enroll directly through their affiliated department, if at all possible.) Introduction to cutting-edge research involving interdisciplinary approaches to bioscience and biotechnology; for specialists and non-specialists. Associated with Stanford's Clark Center for Interdisciplinary Bioscience, and held in conjunction with a seminar series meeting twice monthly during 2000-01. Leading investigators from Stanford and throughout the world speak on their research; students also meet separately to present and discuss the ever-changing subject matter, related literature, and future directions. Prerequisite: keen interest in all of science, with particular interest in life itself. Recommended: basic knowledge of biology, chemistry, and physics.

2 units, Aut, Win, Spr (S. Block)

SURGERY

The following Anatomy courses are open to undergraduates. For graduate and Medical School course offerings, see the Stanford University bulletin School of Medicine.

COURSES

101. An Undergraduate Course in Anatomy—A regional study of human structure, emphasizing the morphology of the trunk and extrem-
Lectures in regional anatomy, dissection of the human body. The anatomy of the area through the dissection process. Enrollment limited to 32.

7 units, Win (Dolph, Glasgow)

101A. An Undergraduate Course in Anatomy—The head and neck portion of the cadaver. Lectures are followed by head and neck dissection. Enrollment limited to 32.

5 units, Spr (Dolph)
Independent Research Laboratories, Centers, and Institutes

Vice Provost and Dean of Research and Graduate Policy and Dean of the Independent Laboratories, Centers, and Institutes: Charles H. Krueger
Associate Dean of Research: Patricia Jones
Associate Dean of Graduate Policy: Thomas Wasow

Independent Research Laboratories, Centers, and Institutes perform multidisciplinary research that extends beyond the scope of any one of the University’s organized schools.

The following laboratories, centers, and institutes report to the Vice Provost and Dean of Research and Graduate Policy:

Center for the Study of Language and Information
Edward L. Ginzton Laboratory
W. W. Hansen Experimental Physics Laboratory
Institute for International Studies
Institute for Research on Women and Gender
Laboratory for Advanced Materials
Stanford Humanities Center
Stanford Institute for Economic Policy Research

The Hoover Institution on War, Revolution and Peace and the Stanford Linear Accelerator Center (SLAC) report to the President and Provost. SLAC is independently operated under a contract with the Department of Energy.

Following is a description of each organization’s activities, including research activities and, where applicable, courses offered.

STANFORD INSTITUTE FOR ECONOMIC POLICY RESEARCH

Director: John B. Shoven

The primary mission of the Stanford Institute for Economic Policy Research (SIEPR) is to encourage and support research on economic policy issues in areas such as economic growth, technology policies, environmental and telecommunication regulation, tax reform, international trade, and monetary policy. SIEPR pursues four interrelated goals in support of this mission: (1) stimulating graduate student and faculty research on economic policy issues of continuing importance; (2) communicating its findings broadly; (3) building a community of scholars conducting research on policy issues; and (4) linking the policy community at Stanford with decision-makers in business, government, and academia.

SIEPR is a University-wide research center, involving economists from the schools of Business, Engineering, Law, Humanities and Sciences, as well as the Hoover Institution and the Institute for International Studies. Affiliated faculty and students maintain appointments in their home departments while working on SIEPR projects. In addition, scholars visiting from other institutions may apply for affiliation with SIEPR.

Much of the research at SIEPR takes place in research centers or research programs. The Center for Research on Economic Development and Policy Reform (Anne O. Krueger, Director) fosters research on the economic problems of developing economies and economies in transition, as well as analyzing the political aspects of economic policy reform and historical episodes of reform. For more information about this program call (650) 725-8730. The Center for Research on Employment and Economic Growth (Paul Romer, Director) is focusing on the 21st century, the relationship between long-term economic growth, the economic success of individuals and families in their jobs and careers, and the role played by higher education and how it can supply workers and technology in the work force.

Research programs within SIEPR and their directors are Energy, Natural Resources, and the Environment Program (James L. Sweeney); the Finance Program (Michael J. Boskin and John B. Shoven); the High Technology Impact Program (Paul A. David); the International Economy Program (Anne O. Krueger); the Program on the Japanese Economy (Masahiko Aoki); the Macroeconomics and Monetary Policy Program (John B. Taylor); the Program in Regulatory Policy (Roger Noll); the Tax and Budget Policy Program (B. Douglas Bernheim and John B. Shoven); and the Technology and Economic Growth Program (Timothy Bresnahan, Ralph Landau, and Nathan Rosenberg).

SIEPR does not offer courses for academic credit, admit students, or award degrees. SIEPR is located on the first floor of the Landau Economics Building, 579 Serra Mall, at the corner of Serra and Galvez Streets, telephone (650) 725-1874, or see http://www.siepr.stanford.edu.

EDWARD L. GINZTON LABORATORY

Director: David A. B. Miller

The Ginzton Laboratory houses the research activities of a number of faculty members from the departments of Applied Physics, Electrical Engineering, and Mechanical Engineering. The multidisciplinary foundations of faculty, students, and research provide a dynamic academic environment for a broad spectrum of scientific research including acoustic and optical techniques for semiconductor measurements, biophysics, fiber optics, high temperature superconductors, laser physics and applications, mesoscopic devices, microelectromechanical devices and systems, optoelectronic devices and systems, scanning optical microscopy, solid state physics, squeezed light, tunneling and force microscopy, and ultrafast and nonlinear optics.

W. W. HANSEN EXPERIMENTAL PHYSICS LABORATORY (HEPL)

Director: Robert L. Byer

HEPL is an independent laboratory celebrating over 50 years of fundamental science and engineering research. HEPL faculty and students are engaged in research in accelerator physics, astrophysics, dark matter in the universe, free electron lasers, fundamental tests of relativity in space, gamma ray observations, gravitational wave detection, quantum condensed matter, and space based solar physics studies. Many of the programs involve satellite-based studies in fundamental physics and engineering.

STANFORD HUMANITIES CENTER

Director: Peter Stansky
Associate Director: Susan E. Dunn

The Stanford Humanities Center promotes humanistic research and education at Stanford and nationwide. In particular, it stresses work of an interdisciplinary nature, accomplished through the following programs: one-year residential fellowships for advanced research by Stanford faculty, faculty members from other institutions, and Stanford graduate students; public presentations (through lectures, colloquia,
The Institute for International Studies promotes individual and collaborative research on contemporary, policy-relevant issues that are international and interdiscipline in character. Working in partnership with the seven schools at Stanford (Business, Earth Sciences, Education, Engineering, Humanities and Sciences, Law, and Medicine) and with the Hoover Institution, IIS fosters excellence in research and teaching across disciplinary, school, and national boundaries. The priority areas of research are in the fields of international and regional peace and security; economic development and political change in East and Southeast Asia; the global environment challenge; and the delivery of health care in a comparative perspective.

Opportunities for undergraduate research include the Goldman International Honors Program in Environmental Science, Technology, and Policy. Students selected for the honors program will fulfill individual department course requirements, attend a year-long seminar on international security research, and produce an honors thesis with policy implications. In order to qualify for the program, students must demonstrate sufficient depth and breadth of international security course work. Ideally, applicants to the program should have taken Management Science and Engineering (MS&E) 190/Political Science 138 (International Security in a Changing World), MS&E 193/Political Science 134P (The Role of Technology in National Security), Political Science 134A (Strategy, War, and Politics), and at least one related course such as Economics 150 (Economics and Public Policy), Science, Technology, and Society 110 (Ethics and Public Policy), Sociology 160 (Formal Organizations), Sociology 166 (Organizations and Public Policy), and Political Science 143S (Major Issues in International Conflict Management).

COURSES

ENGLISH
371. Seminar: Chaucerian Inheritances—The Production of Literary Authority
4-5 units, Win (Kuskin)

HISTORY
250B. Undergraduate Colloquium: Constitutional Interpretation in History and Theory
5 units, Win (Rakove)

INTRODUCTION TO THE HUMANITIES
43. Self-Reflections: The Examined Life
3 units, Spr (Welsch)

PHILOSOPHY
285. Beyond Anthropocentrism?
3 units, Spr (Welsch)

RELIGIOUS STUDIES
270. Science and Religion
4 units, Aut (Bergman, Eisen)

SPANISH AND PORTUGUESE
253E. The Modern Imagination and Mexico’s Ancient Books
3-5 units, Aut (Brotherston)

INSTITUTE FOR INTERNATIONAL STUDIES (IIS)

Director: David Holloway (on leave 2000-01)
Acting Director: Coit Blacker

The IIS central office is located at 100 Encina Hall, telephone (650) 723-4581. For more information about particular IIS programs, contact the programs directly (area code 650):

Asia/Pacific Research Center, 723-9741
Bechtel Initiative on Global Growth and Change, 723-1737
Center for Environmental Science and Policy, 725-2606
Center for Health Policy, 723-1020
Center for International Security and Cooperation, 723-9625
European Forum, 723-4716
Inter-University Center for Japanese Language Studies, 725-1490
Stanford Program on International and Cross-Cultural Education (SPICE), 723-1116
Stanford Japan Center-Research, 011 75-752-7073, ext. 40

UNDERGRADUATE PROGRAMS

INTERCOLLEGIATE HONORS PROGRAM IN ENVIRONMENTAL SCIENCE, TECHNOLOGY, AND POLICY

The Center for Environmental Science and Policy (CESP) coordinates a University-wide intercollegiate honors program in environmental science, technology, and policy. Undergraduates planning to participate in the honors program are required to pursue studies in environmental sciences, technology, and policy, with a concentration in a single discipline. After completion of the prerequisite units, students join small group honors seminars to work with specific faculty members in the environmental field on an honors thesis that incorporates both scientific principles and the policy aspects of selected environmental issues.

Courses in environmental studies appear under the course listings of the schools of Earth Sciences, Engineering, and Humanities and Sciences. Information about and applications to this program may be obtained from CESP, E401 Encina Hall East; telephone (650) 723-5697.

COURSES

195. Intercollegiate Honors Program in Environmental Science, Technology, and Policy—Students from the schools of Humanities and Sciences, Engineering, and Earth Sciences analyze important problems in a year-long small group seminar. Combines research methods, oral presentations, preparation of an honors thesis by each student, and where relevant, field study.
9-15 units, Aut, Win, Spr (Naylor, Falcon, Freyberg, Goulder, Mison, Schneider)

INTERCOLLEGIATE HONORS PROGRAM IN INTERNATIONAL SECURITY

The Center for International Security and Cooperation (CISAC) coordinates a University-wide intercollegiate honors program in international security. Students selected for the honors program will fulfill individual department course requirements, attend a year-long seminar on international security research, and produce an honors thesis with policy implications. In order to qualify for the program, students must demonstrate sufficient depth and breadth of international security course work. Ideally, applicants to the program should have taken Management Science and Engineering (MS&E) 190/Political Science 138 (International Security in a Changing World), MS&E 193/Political Science 134P (The Role of Technology in National Security), Political Science 134A (Strategy, War, and Politics), and at least one related course such as Economics 150 (Economics and Public Policy), Science, Technology, and Society 110 (Ethics and Public Policy), Sociology 160 (Formal Organizations), Sociology 166 (Organizations and Public Policy), and Political Science 143S (Major Issues in International Conflict Management).
Laboratory for Advanced Materials

Director: Alexander L. Fetter

The Laboratory for Advanced Materials (LAM) supports the research activities of a number of faculty members from the departments of Applied Physics, Chemical Engineering, Chemistry, Electrical Engineering, Materials Science and Engineering, Mechanical Engineering, and Physics. The multidisciplinary foundations of faculty, students, and research provide a dynamic academic environment for a broad spectrum of scientific research including high temperature superconducting materials and devices, mesoscopic devices, magnetic recording and storage media materials, electronic materials, opto-electronic materials, nanomaterials and devices, highly correlated electronic systems, computational materials science, condensed matter theory and physics, polymers, and biological materials, crystal growth, and thin film synthesis of complex oxides.

The foundation of the research performed at LAM is the Center for Materials Research (CMR). CMR is one of many National Science Foundation Materials Research Science and Engineering Centers (MRSECs) located at various U.S. universities. It provides both analytical and synthesis facilities for the Stanford materials research community and supports multidisciplinary materials research projects involving faculty from many academic departments. It also has programs for undergraduate research, women, and minorities and for outreach to local high schools.

CMR supports a wide range of analytical facilities for advanced materials characterization. This includes electron microprobe analysis (EMPA), micro Raman spectroscopy, Rutherford backscattering (RBS), scanning electron microscopy (SEM), scanning probe microscopy (SPM), transmission electron microscopy (TEM), x-ray diffraction analysis, and x-ray photoelectron spectroscopy (XPS). To serve the synthesis and materials fabrication needs of the community, CMR also supports the vapor phase synthesis facility and bulk crystal growth capabilities. In addition to the multi-investigator, interdisciplinary research group (IRG) programs, CMR also sponsors seed research projects for new and risky ideas. Its professional staff also conduct research and development of new tools and techniques in areas related to advanced materials synthesis and characterization.

The Laboratory for Advanced Materials is housed in the McCullough Building and the Moore Materials Research Building.

Center for the Study of Language and Information (CSLI)

Director: Byron Reeves

CSLI is devoted to research in the emerging science of information, computing, and cognition. It is an interdisciplinary endeavor, bringing researchers together from academe and industry in the fields of artificial intelligence, computer science, linguistics, logic, philosophy, and psychology. CSLI's researchers are united by their common interest in the communication and information processing that ties together people and machines. Their blend of academic disciplines, communication, education, linguistics, philosophy, psychology, along with computer science, gives them a unique perspective on the human side of human interface problems. Like the interface problem, projects at CSLI have both an applied side and a theoretical side. The more applied projects are located in the Interface Lab, and the more theoretical projects are located in the Cognitive Science Center.

On the applied side, researchers are pursuing a wide variety of topics, including machine learning, natural language acquisition, text understanding, computer languages, software design strategies, human interface design, access to computers and the internet for people with disabilities, and distance education. On the theoretical side, roughly half the projects deal with languages (natural and computer), and the vehicles by which information is communicated between agents. The others deal with a variety of questions involving the acquisition and manipulation of information: how agents acquire and use information to guide action; what information processing architectures are best suited to various tasks; how representational format affects information processing and human comprehension, and so on.

Course work related to the research at CSLI can be found in the "Program in Symbolic Systems" section of this bulletin.

CSLI is located at the corner of Campus Drive West and Panama Street, in Ventura Hall and Cordura Hall; telephone (650) 723-3084.

Institute for Research on Women and Gender

Director: Laura L. Carstensen

During the last decade, research on women and gender has had a profound influence on the social and medical sciences, and the humanities. Since its founding, the Institute for Research on Women and Gender's primary mission is to support scholarship on subjects related to women and gender and to organize educational programs that communicate these findings to a broader public.

Stanford faculty, staff, graduate students, and members of the community work together to stimulate a more informed analysis of issues concerning gender.

Institute projects span a wide range of disciplines but rest on certain shared premises: that gender is a vital category of analysis for contemporary scholarship and policymaking and that the experiences of women as individuals and as a group can best be understood within their historical, social, and cultural contexts. The institute sponsors interdisciplinary research seminars and conferences that examine gender issues in areas such as art, education, employment, family structures, health care, history, law, literature, and psychology. Many scholarly publications have resulted from these activities.
HOOVER INSTITUTION ON WAR, REVOLUTION AND PEACE

Director: John Raisian

The Hoover Institution, founded in 1919 by Stanford alumnus Herbert Hoover, is a public policy research center where a distinguished group of scholars debate, study, refine and disseminate ideas designed to strengthen society within the context of three core values: individual freedom, private enterprise, and representative government.

Three thematic areas have been established that focus on the interaction of politics and government. Research centers on three broad programs:

American Institutions and Economic Performance, which explores ways to enable the U.S. economy and education, legal, and legislative systems to perform better, thereby providing an ever-higher quality of life, increased economic opportunity, and greater economic freedom for all citizens.

Democracy and Free Markets, which seeks to understand and foster both the development of democratic processes and institutions and the shift from state control of economies to greater reliance on free markets.

International Rivalries and Global Cooperation, which examines not only questions of war and peace but all types of rivalries and cooperation (economic, political, religious, and cultural) and focuses on interrelationships between countries.

Studies within each of these three areas typically address issues relating to balancing government and private initiatives, promoting individual freedom, and strengthening free-market economies and democratic institutions.

STANFORD LINEAR ACCELERATOR CENTER (SLAC)

Director: Jonathan Dorfan

The Stanford Linear Accelerator Center is devoted to experimental and theoretical research in elementary particle physics and astrophysics, to the development of new techniques in high energy accelerators, and to research and development in particle detectors. The Stanford Synchrotron Radiation Laboratory (SSRL), a division of SLAC, operates the SPEAR storage ring as a source of intense vacuum ultraviolet and x-ray beams for research in biology, chemistry, material science, and physics. The center is on 425 acres of Stanford property west of the main campus and is operated under a contract with the Department of Energy.

SLAC is operated by Stanford as a national facility so that qualified scientists from universities and research centers throughout the country and world, as well as those at Stanford, may participate in the high energy physics research program of the center. Stanford graduate students may, with the approval of their departments, carry out research for the Ph.D. degree with members of the SLAC faculty. Graduate students from other universities also participate in the research programs of visiting groups.

Research assistantships are available for qualified students by arrangement with individual faculty members. There are also opportunities for summer employment in the research groups at the center. Interested students should contact Professor Schindler, the Graduate Student Adviser.

STANFORD SYNCHROTRON RADIATION LABORATORY (SSRL)

Director: Keith O. Hodgson

SSRL is a national research facility supported by the Department of Energy for the utilization of synchrotron radiation for research in the natural sciences, medicine, and engineering. SSRL is a division of the Stanford Linear Accelerator Center.

SSRL has research programs in accelerator physics and development of advanced sources of synchrotron radiation, including short-wavelength free electron lasers. The lab is interdisciplinary with students from the following Stanford departments actively pursuing degrees: Applied Physics, Chemical Engineering, Chemistry, Earth Sciences, Electrical Engineering, Materials Science and Engineering, Physics, and Structural Biology.

Students interested in working at the facility should contact a member of the SSRL faculty, one of the assistant directors, or other members of the Stanford faculty who use SSRL in their research programs.
LIBRARIES AND ACADEMIC INFORMATION RESOURCES

University Librarian and Director of Academic Information Resources:
Michael A. Keller

Stanford University Libraries and Academic Information Resources develops and implements services within the University libraries that support research and instruction including academic computing functions. These services include acquiring and making available library collections in all formats, establishing policies and standards to guide the use of academic information resources, developing training and support programs for academic uses of computers, and maintaining the on-line library catalog.

In each library unit, reference staff provide general advice on locating and using both print and on-line information sources. Subject specialists and reference librarians offer assistance in specific disciplines either individually or in groups, by lecture to classes on request, tours, demonstrations, or special workshops.

The Academic Computing group supports and enhances instruction and research by providing library and academic computing services and resources. These services include information, advice, and education about academic technology or the use of technology in learning and teaching; operation of the computer clusters and classrooms in Meyer Library; faculty-specific computer resources; and residential computing services.

Information about the scope of collections, physical facilities, and services (such as general borrowing regulations, reserve books, book stack access, interlibrary loans, and photocopies) is available on the World Wide Web (http://www-sul.stanford.edu) and in printed publications and online guides (http://acomp.stanford.edu/acpubs/briefguide/). Anyone wishing further explanation of library services should consult the Privileges Desk or the reference staff in Cecil H. Green Library, or the reference staff in the University Libraries branches.

CENTRAL CAMPUS LIBRARIES

The Cecil H. Green Library (East and Bing Wings) maintains research collections in the humanities, social sciences, area studies, and interdisciplinary areas. These collections number more than 2.5 million volumes. The J. Henry Meyer Memorial Library houses the Academic Computing group of the Stanford University Libraries and Academic Information Resources (SUL/AIR) and provides instructional support services.

During regular academic sessions, both libraries are open Monday through Thursday from 8 a.m. to 12 midnight, Friday from 8 a.m. to 6 p.m., Saturday from 9 a.m. to 9 p.m. (Meyer is open 1 p.m. to 9 p.m. on Saturday.), and Sunday from 12 noon to 12 midnight. Library hours information, including hours for holidays, intersessions, and other libraries on campus, is available on the Web at: http://www-sul.stanford.edu/geninfo/libhours.html.

These libraries can seat more than 2,000 readers at one time in a variety of seating arrangements-carrels, lounge areas, tables, computer workstations, individual studies, and group study rooms. Readers can connect their laptops to the campus network in many library locations.

Major service units housed throughout Green Library include: the Information Center; the Humanities and Area Studies Reading Room, the Social Science and Government Documents Reading Room; Foreign Language and Area Collections; Access Services; Current Periodicals, Newspapers, and Microtexts; and the Interlibrary Services Office. Green Library also houses reserves for most graduate and undergraduate courses in the humanities and social sciences, the Department of Special Collections, and the University Archives.

Meyer Library houses the University’s Digital Language Lab, computer clusters, technology-enhanced classrooms, an Academic Technology Lab, an Assistive Computer Technology Center, and the central offices of Residential Computing.

Throughout Green and Meyer, there are computers providing access to the on-line library catalog, photocopy machines, and courtesy and pay telephones.

BRANCH LIBRARIES

Humanities and Social Sciences Branch Libraries include the Art and Architecture Library, the Cubberley Education Library, and the Music Library (including the Archive of Recorded Sound).


More information about these libraries is on the Web at http://www-sul.stanford.edu/geninfo/libraries.html.

COURSES

The following are intended to serve those students for whom a more extended study of bibliographic organization is useful.

ART AND ART HISTORY

600. Art History Bibliography and Library Methods
3 units, Aut (Ross)

FRENCH AND ITALIAN

201E. New Methods and Sources: French and Italian Studies
1-4 units, Aut (Parrine)

MUSIC

200. Graduate Proseminar
4 units, Aut (K. Berger, Nagy)

SLAVIC LANGUAGES AND LITERATURES

200A. Introduction to Library and Archival Research in Slavic Studies
not given 2000-01

LIBRARIES-COORDINATES

J. Hugh Jackson Library, Graduate School of Business
Director: Shirley Hallblade

Lane Medical Library
Director: Thomas Rindfleisch

Crown Law Library
Director: Lance E. Dickson

Stanford Linear Accelerator Center Library
Head Librarian: Patricia Kreitz

HOOVER INSTITUTION ON WAR, REVOLUTION AND PEACE

Director: John Raizian
Deputy Director: Charles G. Palm

Since its founding by Herbert Hoover in 1919 as a special collection dealing with the causes and consequences of World War I, the Hoover
Institution on War, Revolution and Peace has become an international center for documentation, research, and publication on political, economic, social, and educational change in the 20th century.

The library includes one of the largest private archives in the world and has outstanding area collections on Africa, East Asia, Eastern Europe, Russia and the former Soviet Union, Latin America, the Middle East, North America, and Western Europe.

Holdings include government documents, files of newspapers and serials, manuscripts, memoirs, diaries, and personal papers of men and women who have played significant roles in the events of this century, the publications of societies and of resistance and underground movements, and the publications and records of national and international bodies, both official and unofficial, as well as books and pamphlets, many of them rare and irreplaceable. The materials are open to all Stanford students, faculty, and staff, and to scholars from outside the University.

INFORMATION TECHNOLOGY SYSTEMS AND SERVICES (ITSS)

ITSS provides University leadership for the planning, development, acquisition, and operation of University-wide networking and telecommunications services, information systems, data administration, and information technology infrastructure support services for instruction, research, and administrative activities. Core services provided to the Stanford Community include:

- Applications support information architecture, planning, and standards
- Computer and campus network operations; and assessment and application of new technologies
- Data administration, data warehouse services
- Data, voice, and video communications
- New information systems acquisition, assembly, and integration
- Technology training, consulting, and help desks

More information about the complete range of ITSS services, supported systems, and application initiatives can be found on the web at http://www-leland.stanford.edu/dept/itss.

COMPUTING SERVICES

Production computing services are provided by ITSS from both the Leland and Forsythe Operations Centers. These services include access to distributed software (for example, Netscape and Eudora), public domain software, major programming languages, commercial statistical packages, Stanford developed applications, and the Stanford University Network (SUNet). Stanford faculty, staff, and students who have a valid Stanford ID may apply for a SUNet ID (Stanford University Network Identifier) on the web at http://www-leland.stanford.edu/group/itss/services/sunetid. SUNet IDs provide access to Stanford’s network and the Internet, an email account, disk space for Web pages and email, and site-licensed software. Additionally, ITSS computer based services include screen-text editing (WYLBUR, emacs, pico), electronic mail (EMS, elm, pine) and formatting (SCRIPT) for preparing reports, data, and theses; SPIRES, the Stanford-developed data-base management system; Oracle and Sybase relational database environments; Prism, the on-line collection of Stanford administrative files and services; and Polio, the on-line collection of Stanford’s academic and institutional data resources, including a large number of index and citation databases (ERIC, GeoREF, Lexis/Nexis, Merck, Federal Register); Socrates, Stanford’s on-line library catalog; Usenet newsgroups, World Wide Web services, and an increasing number of client/server based applications including the Oracle financial applications. Detailed information regarding these services is available on the web at http://www-leland.stanford.edu/dept/itss/services. Specific questions regarding ITSS computing services can be sent via email to consultforsythe.stanford.edu, or call (650) 725-8181.

VOICE, VIDEO, DATA, AND NETWORKING

ITSS provides telephone, paging, and video conferencing services for Stanford faculty, staff, and students and also runs the paging service for the hospital. The internal network maintained by ITSS allows for high speed access to Stanford networking services and external networks including the Internet. Dial-in service through the modem pool allows remote access to University host computers. ISDN support has recently been added to the range of ITSS services, and an agreement with Internet Service Provider NetCom allows for discounted subscription rates for high-speed dial-in access for Stanford faculty, staff, and students. Additionally, ITSS manages Stanford’s cable television channel, Channel 51, and the STV cable subscription service for students residing on campus.

COURSES

UNIX, Leland, E-mail—Introductory information about UNIX on the Leland Systems, the EM-ACS text editor, electronic mail, and the Treadder and Meyer Computer Clusters. Full class descriptions are available on the web at http://consult.stanford.edu/introclasses.html.

The Stanford Computer Environment, the Internet, Portfolio, Windows, and Macintosh Applications—Word processing and text formatting, database management, statistical and programming applications, desktop publishing, spreadsheets, html, and communications. Class descriptions, schedules, and registration information are available on the web at http://www-leland.stanford.edu/group/itss-customer/if/.
The Continuing Studies Program

Dean and Associate Provost: Charles Junkerman

The Continuing Studies Program provides adult members of the surrounding communities with the opportunity to take classes on a part-time basis for intellectual enrichment, both personal and professional. Courses are offered in all four academic quarters, with over 300 courses planned for the 2000-01 academic year.

The faculty are primarily drawn from the ranks of the University’s distinguished professoriate. The program presents a wide variety of courses, with a central concentration in such humanities disciplines as art, literature, history, and music.

Tuition discounts are available to University employees and their spouses/domestic partners, Stanford students and their spouses/domestic partners, Stanford Alumni Association members, teachers (K-12), and those over age 65.

For a course catalogue, contact the Continuing Studies Program, Building 590, Room 103, Stanford, CA 94305; phone (650) 725-2650; fax (650) 725-4248; email continuingstudies@stanford.edu; or visit the website at http://continuingstudies.stanford.edu.

The Continuing Studies Program also administers The Master of Liberal Arts Program, Summer Session, and portions of alumni education.

MASTER OF LIBERAL ARTS PROGRAM

Assistant Dean and Lecturer in English: Linda Paulson

Participating Faculty: Marc Bertrand (Professor, French), Eavan Boland (Professor, English), John Bravman (Professor, Material Sciences and Engineering), Wanda Corn, (Professor, Art and Art History), Gerry Dorfman (Senior Fellow, Hoover Institute, and Political Science), Martin Evans (Professor, English), Larry Friedlander (Professor, English), Hester Gelber (Professor, Religious Studies), Tom Hare (Professor, Asian Languages), Charles Junkerman (Dean, Continuing Studies Program), Marsh McCall (Professor, Classics), Mark Mancall (Professor, History), David Palumbo-Liu (Professor, Comparative Literature), Linda Paulson (English), Dennis Phillips (Professor, Education, and Philosophy), John Rick (Professor, Anthropological Sciences), Paul Robinson (Professor, History), Steven Zipperstein (Professor, History), Ernlé Young (Co-director, Center for Biomedical Ethics)

Program Description—The Master of Liberal Arts (MLA) Program aims to provide a flexible, interdisciplinary program for returning adult students who seek a broad education in the liberal arts. The underlying premise of the MLA program is that knowledge gained through an interdisciplinary course of study leads to intellectual independence and satisfaction not always found in discipline-based programs of study. The goals of the MLA program are to develop advanced critical thinking, to foster intellectual range and flexibility, and to cultivate an individual’s ability to find the connections among different areas of human thought: art, history, literature, music, philosophy, political science, science, and theology.

The program is designed with part-time students in mind: seminars meet in the evening, and students complete the degree in 4-5 years. All master’s seminars are taught by members of the Stanford faculty who are experienced in working with students at the graduate level. Class size is limited to 20 students.

Degree Requirements—Candidates for the MLA degree must complete a minimum of 36 units of course work. These units must include two 3-unit core seminars for entering students, at least seven 3-unit MLA seminars, and a 2-unit master’s thesis. The remainder of the 36-unit requirement may be fulfilled by additional MLA seminars or by relevant Continuing Studies Program course offerings. Students must also fulfill distribution requirements by taking at least 2 units of credit in each of the following areas: humanities; social science or social policy; and science, engineering, or medicine.

MLA Seminars—To maintain minimum progress toward the degree, students should complete at least two of the required seven seminars per year. Each year, at least nine seminars are offered in the MLA program. Each MLA course requires a substantial seminar paper. Students are encouraged to use these papers as a way to investigate new fields of interest, as well as a way to develop different perspectives on issues in which they have an ongoing interest.

Core Seminars—The first core seminar for entering students, whose thematic focus varies from year to year, prepares students to do interdisciplinary graduate work at Stanford. Students concentrate on writing a critical argumentative graduate paper, conducting library research, presenting the results of their research, and productively participating in a collaborative seminar. This course is required of entering students in the Autumn Quarter of their first year; occasionally, it is offered in Summer Quarter.

The second core seminar explores the history of literary criticism from classical times to the present, while at the same time focusing on such fundamental issues as the nature and formation of the canon, the validity of critical interpretation, and the relationship between literature, philosophy, and history. This course is required of entering students in the Spring Quarter of their first year.

Master’s Thesis—The MLA program culminates in the master’s thesis. Students approaching the end of the program write a thesis, approximately 50-75 pages in length, that evolves out of work they have pursued during their MLA studies. The thesis is undertaken with the prior approval of the MLA program, and under the supervision of a Stanford faculty member. During the process of writing the thesis, students are members of a work-in-progress group, which meets regularly to provide peer critiques, motivation, and advice. Each student presents the penultimate draft of the thesis to a colloquium of MLA faculty and students, in preparation for revising and submitting the final draft to the adviser and to the MLA Program. Additional information can be obtained from the Continuing Studies Program, Building 590, Room 103, Stanford, CA 94305; phone (650) 725-2650; fax (650) 725-4248.

COURSES

102. The Plague: An Introduction to Interdisciplinary Graduate Study—Required course for incoming MLA students.
3 units, Aut (Paulson)

68. Biography and Biographers in Fiction, Memoir, and Elsewhere
3 units, Aut (Zipperstein)

69. Ethical Questions and Controversies in Select Medical Specialties
3 units, Aut (Young)

70. Complex Societies: The Archaeological Origins of Human Inequality
3 units, Win (Rick)

71. Traditional Chinese Poetry and English Romantic Poetry: Reading Landscapes
3 units, Win (Palumbo-Liu)

72. 1855-1857: A Reading of Charles Dickens’ Little Dorrit
3 units, Win (Paulson)

73. Medieval Japan
3 units, Spr (Hare)
74. Evolution and Philosophical thought in the Late 19th and 20th Centuries
  3 units, Spr (Phillips)

105. From Plato to Postmodernism: A History of Literary Criticism—Required course for first-year MLA students.
  3 units, Spr (Evans)

75. Chateau Culture of Renaissance France
  3 units, Sum (Bertrand)

76. Comparative Political Issues
  3 units, Sum (Dorfman)

SUMMER SESSION

Assistant Dean and Director: to be announced
Director of Student Services: Carolyn Faszholz

Students attending Stanford Summer Session enroll in either the Regular Degree Program or the Summer Visitor Program.

The Regular Degree Program is for students who are candidates for a Stanford degree and who are continuing their academic work in the Summer Quarter. Degree-seeking Stanford students should indicate on Axess (during Spring Quarter) their intention to register for the Summer Quarter. Separate application is not required.

The Summer Visitor Program is for students who are not presently candidates for a Stanford degree. It is open to persons 18 years or older, and high school students who have completed at least their junior year. High school students may only attend if admitted to Stanford's Summer Session through the Summer College for High School Students or Summer Discovery Institutes.

Students in the Summer Visitor Program enjoy all the privileges of students in the Regular Degree Program except that work completed cannot apply toward a Stanford degree or credential until the student has been admitted to regular standing. Admission as a summer visitor does not imply later admission to matriculated status. However, should the visitor matriculate at a later date through normal admission procedures, the summer work may, in most cases, be applied toward the requirements for a Stanford degree or credential.

Students who are interested in Summer Session programs may call (650) 725-6080; email summersession@stanford.edu; fax (650) 725-6080; or write to the Summer Session Office, Building 590, Ground Floor, Stanford, CA 94305-3005. Request a copy of the Stanford University catalogues, Summer Session or Summer College for High School Students. These catalogues include all the pertinent information (including fees, housing, activities, course listings) and an application form. All information listed in both catalogues is also posted on the World Wide Web and is updated each February. The Summer Session web address is http://summersession.stanford.edu.
STUDENT AFFAIRS

Student Affairs supports the academic mission of the University by providing a climate conducive to living and learning in a diverse community. The organization encompasses a broad range of programs and services for undergraduate and graduate students in the areas of health services, student life, residential education, advising and tutoring, career services, housing and food services, financial services, and registration. It serves the wider community through the Haas Public Service Center and is responsible for the information systems and institutional reporting on students, courses, and classrooms.

The Vice Provost for Student Affairs provides policy direction, administers support for budget, personnel, facilities, and development, and has oversight of the efficiency and effectiveness of each of the organization’s units. The Vice Provost interacts with the President, the Provost, the University Cabinet, schools, department representatives, and students, and is an ex officio member of the Senate of the Academic Council.

DEAN OF STUDENTS

The Office of the Dean of Students seeks to ensure that the University is sensitive and responsive to the needs of students. The office is responsible for several administrative offices and community centers including the Asian American Activities Center; Bechtel International Center; Black Community Services Center; Disability Resource Center; El Centro Chicano; Judicial Affairs; Lesbian, Gay, and Bisexual Community Center; Native American Cultural Center/American Indian Program Office; New Student Orientation; Office of Multicultural Education; Tresidder Memorial Union; the Office of Student Activities, including Greek Affairs; and the Women’s Center. The office also provides consultation and coordination with approximately 450 student organizations, student media, activities, publications, and the Associated Students of Stanford University. The office is located in Tresidder Memorial Union, telephone (650) 723-2733. Students are welcome to visit the Dean of Students to discuss ideas, personal issues, or general concerns about student life.

DISABILITY RESOURCE CENTER (DRC)

The Disability Resource Center is the central administrative office that coordinates a variety of services and resources for undergraduate and graduate students with documented disabilities. The students who use the DRC’s services have a variety of disabilities, including mobility impairments, learning disabilities, chronic illness, psychological disabilities, and sensory disabilities. The mission of the DRC is to provide disabled students with access to all facets of University life: education, housing, recreation, and extracurricular activities. To initiate services, a student contacts the DRC directly and meets with a program coordinator to determine what services and accommodations are available to support the student’s disability-related needs. Students who are eligible for services and accommodations are allowed to submit professional documentation of their disabilities to the DRC. Services may include, but are not limited to, books on tape, braille, a distraction-free room for taking examinations, extended time on examinations, notetaking, oral or sign language interpretation, and stenocaptioning. The DRC also has adaptive computer equipment in a workstation in Meyer Library. During the academic year, the DRC runs a golf cart service called DisGo Cart for use by students with temporary and permanent mobility impairments. The DRC is located at 123 Meyer Library. Office hours are 9 a.m. to 12 noon and 1 to 5 p.m., Monday through Friday. For more information call the DRC at (650) 723-1066 (voice) or 723-1067 (TDD).

INTERNATIONAL CENTER

The Bechtel International Center (I-Center) is a meeting place for students and senior research scholars at Stanford from throughout the world and for internationally oriented U.S. students, faculty, and visitors on the campus. Through a variety of social, cultural, and educational programs, I-Center facilities are utilized to acquaint students and scholars with the life of the University and the community, and to bring them together in activities of mutual interest.

The I-Center emphasizes the international dimensions of the University through its counseling services, through the cultural contributions to campus life by the various nationalities represented, and by bringing to the attention of U.S. students the many opportunities for work, volunteerism, study, and travel abroad.

Responsibilities of the I-Center advisers, working closely with the University’s academic departments, include advising foreign students on matters such as immigration, housing, practical training, transactions with foreign governments, study programs, and financial-aid problems; counseling in personal matters relating to academic performance, psychological and cultural adjustment, and proficiency in English; coordinating the international reception and orientation program; encouraging utilization of foreign students as resource people in a variety of academic programs; and evaluating the Stanford experience after the students return home.

TRESIDDER MEMORIAL UNION

Tresidder Memorial Union (TMU) is a center of community activity on the Stanford campus. It houses a variety of food services; meeting rooms for special occasions; a campus information center; branch offices and ATMs for the Stanford Federal Credit Union, and Wells Fargo; ATMs for Bank of America; a fitness center; and a hairstyling shop. Tresidder Express carries groceries, magazines, and sundries. A full range of food services is provided at TMU.

TMU is also the home of the Associated Students of Stanford University (ASSU), and the Office of the Vice-Provost for Student Affairs and the Office of Student Activities/Dean of Students office.

To learn more about activities in Tresidder Union, as well as events on and off campus and employment opportunities, stop by the Information Center on the first floor, or telephone (650) 723-3384.

VOLUNTARY STUDENT ORGANIZATIONS

At its March 1963 meeting, the Board of Trustees adopted the following policy:

"Students are encouraged to study, discuss, debate, and become knowledgeable about contemporary affairs. Expressing opinions or taking positions with respect to these matters is up to the individual students or to volunteer groups of students so constituted that they are authorized to speak for their members. This is not a function of student government at Stanford.

"All students are required to become members of the Associated Students of Stanford University, which represents them with respect to student affairs on the Stanford campus. The student government, under this policy, is not authorized to speak for students on other matters.

"Under such regulations as may be established from time to time by the President of the University, students may form voluntary organizations to speak for their members with respect to matters outside the scope of student government. Provided such organizations clearly identify themselves and, in any public statements, make it clear that they do not represent or speak for the University or the Associated Students.

"Any questions concerning interpretation and application of this policy shall be resolved by the President of the University."

Voluntary student organizations are those organizations: (1) in which membership is not mandatory, (2) in which membership is both open and limited to members of the Stanford community, that is, Stanford students, faculty members, and staff, and their immediate families, and (3) whose purposes and procedures are not inconsistent with the goals and standards
of the University. In order to use University facilities and/or the Stanford name, all voluntary student organizations must register with the University through the Office of Student Activities/Dean of Students Office on the second floor of Tresidder Memorial Union.

As conditions of registration, each voluntary student organization must file the following:

1. A statement of purpose and organizational constitution.
2. A statement about membership eligibility.
3. A statement that, should Stanford facilities be used for the generation or collection of funds, all funds of the organization shall be deposited with the Students’ Organizations Fund (SOF) in the ASSU Office and shall be handled by the Treasurer of the organization in the manner prescribed by the rules and regulations of the fund and of the ASSU. (Sectarian religious organizations in the Stanford environs may be exempt from the requirement of membership in the SOF, with the approval of the ASSU Student Financial Manager and Office of Student Activities.)
4. Identification of the authorized representative of the group, who must be a currently registered student, and at least five active members in the organization who are currently registered students.

Each voluntary student organization must renew its registration with the University annually, early in Autumn Quarter, by submitting the name of the new authorized representative or by reconfirming the current representative, and by updating other information.

If a voluntary student organization that is registered with the University seeks to use University facilities for meetings open to more than its own members and to specifically invited guests, such meetings shall be subject to the regulations of the Committee on Public Events. Contact Non-academic Facilities Scheduling, the Registrar’s Office, Old Union, for further information about nonacademic room scheduling.

A voluntary student religious organization may hold open meetings in University facilities only with the approval of the Office of the Dean of the Chapel.

A registered voluntary student organization may advocate publicly a position on a public issue, provided the organization clearly identifies itself, and provided such an organization in any public statement makes clear it does not represent or speak for the University or for the Associated Students.

No student group may use University space or facilities or receive University support for purposes of supporting candidates for public office. In accordance with procedures governing public events, groups supporting candidates may have use of public places such as White Plaza for tables, speeches, and similar activities; may have intermittent use of on-campus meeting rooms; and may request to reserve auditoriums and similar space for public events including speeches by political candidates.

Religious Activities—Religious and ethical concerns are shared by a significant number of Stanford undergraduate and graduate students, many of whom are actively involved in a variety of campus religious organizations.

The University’s commitment to the process by which convictions and values are defined and sharpened is manifest in its chaplaincy staff, and its support of the diverse religious groups on campus. Central in Stanford’s history, from its founding, is multi-faith exploration and dialogue—a vital part of both ethos and education in this institution. For further information about religious life at Stanford, call Memorial Church (650) 723-1762.

JUDICIAL AFFAIRS AND STUDENT CONDUCT

In March 1996, President Gerhard Casper convened the Committee of 15 and requested a review of the student judicial charter. During the following year, the Committee of 15 conducted an extensive review of the existing judicial charter and process and drafted a new charter to take its place. The Student Judicial Charter of 1997 was approved by the Associated Students of Stanford University, the Senate of the Academic Council, and the President of the University during Spring Quarter 1996-97 and Autumn Quarter 1997-98, and became effective in January 1998. Cases of alleged violations of the Honor Code, Fundamental Standard, and other student conduct policies now proceed through an established student judicial process based upon the Student Judicial Charter of 1997, which can be found in its entirety at the Judicial Affairs Office website [URL].

Also found at that website are the policies, rules, and interpretations regarding them related to student conduct, including the penalty code applicable to those students found responsible for violating such a policy or rule.

When a violation of the Fundamental Standard, or the Honor Code, or other policy or rule governing student conduct is alleged, or whenever a member of the University community believes such a violation has occurred, he or she should contact the Judicial Affairs Office, Tresidder Memorial Union, 2nd floor, (650) 725-2485.

THE FUNDAMENTAL STANDARD

The primary codes of conduct for students are the Fundamental Standard and Honor Code.

Students are expected to observe the Fundamental Standard of student conduct, which was stated by Stanford’s first President, David Starr Jordan, as follows:

"Students are expected to show both within and without the University such respect for order, morality, personal honor, and the rights of others as is demanded of good citizens. Failure to do this will be sufficient cause for removal from the University."

Actions which have been found to be in violation of the Fundamental Standard include:

- Physical Assault
- Forgery
- Sexual harassment or other sexual misconduct
- Misrepresentation in seeking financial aid, University housing, University meals, or other University benefits
- Driving on campus while under the influence of alcohol
- Misuse of computer equipment or e-mail

There is no standard penalty which applies to violations of the Fundamental Standard. Penalties range from warning to expulsion. Each case is in fact specific; considerations include: the nature and seriousness of the offense, the motivation underlying the offense, and precedent in similar cases.

THE HONOR CODE

The Honor Code at Stanford is essentially the application of the Fundamental Standard to academic matters. Provisions of the code date from 1921, when the honor system was established by the Academic Council of the University Faculty at the request of the student body and with the approval of the President.

A. The Honor Code is an undertaking of the students, individually and collectively:
1) that they will not give or receive aid in examinations; that they will not give or receive unpermitted aid in class work, in the preparation of reports, or in any other work that is to be used by the instructor as the basis of grading;
2) that they will do their share and take an active part in seeing to it that others as well as themselves uphold the spirit and letter of the Honor Code.

B. The faculty on its part manifests its confidence in the honor of its students by refraining from proctoring examinations and from taking unusual and unreasonable precautions to prevent the forms of dishonesty mentioned above. The faculty will also avoid, as far as practicable, academic procedures that create temptations to violate the Honor Code.

C. While the faculty alone has the right and obligation to set academic requirements, the students and faculty will work together to establish optimal conditions for honorable academic work.

Examples of conduct which have been regarded as being in violation of the Honor Code include:

- Copying from another’s examination paper or allowing another to copy from one’s own paper
Giving or receiving aid on an academic assignment under circumstances in which a reasonable person should have known that such aid was not permitted.

In recent years, most student disciplinary cases have involved Honor Code violations; of those, the most frequent arise when a student submits another’s work as his or her own, or gives or receives unpermitted aid. The standard penalty for a first offense is a one-quarter suspension from the University and 40 hours of community service. In addition, many faculty members issue a “No Pass” for the course in which the violation occurred. The standard penalty for a multiple violation (for example, cheating more than once in the same course) is a three-quarter suspension and 60 hours of community service.

CAREER DEVELOPMENT CENTER

The Career Development Center (CDC) is committed to educating the Stanford community about the world of work and helping individuals understand their relationship to it. The CDC encourages both undergraduate and graduate students to consider how their academic course work and other experiences may affect their career decisions. Through a variety of programs and services, the Career Development Center staff helps students and alumni clarify their interests, skills, and values; explore possible career fields; and prepare for the job search in a variety of fields. These programs and services include:

- Care guidance
- Career counseling
- Career interest, skills, and personality inventories
- Fall Career Fair
- Full-time, part-time, internship, and summer job listings available in binders and on the World Wide Web
- Job Connection Day
- Liberal Arts Career and Internship Fair
- On-Campus Recruiting Program
- Reference file service
- Resource library, which includes books, periodicals, handouts, and audio/videotapes
- Workshops on getting started at the CDC, resume writing, interviewing, and the summer and full-time job search process
- Check the CDC web page at http://www.stanford.edu/dept/CDC/ for up-to-date information on programs and events.
- The Career Development Center, located on White Memorial Plaza between the Bookstore and the Clock Tower, is open Monday through Friday from 8:15 a.m. to 4:30 p.m.; telephone (650) 723-3963.

COWELL STUDENT HEALTH SERVICE

Medical Services (650-724-CARE, 724-2273)—Cowell offers comprehensive health care to Stanford students, including diagnosis and treatment of acute illness, injury and chronic conditions, and prevention. Medical appointments are available in general medicine, women’s health, gynecology, orthopedics, and sports medicine. Same-Day Care is open for acute illness or injury on a walk-in basis. If consultation with a specialist is needed, students are referred to the appropriate clinic at the Stanford Medical Center.

A nurse is available during office hours to answer routine medical questions by phone. Advice for urgent conditions is provided 24 hours a day by Cowell’s on-call physician. Additional services include pharmacy; physical therapy; Allergy, Injection, and Immunization Clinic; Travel Clinic; physical exams for employment or scholarships; HIV testing; laboratory; and x-ray.

Counseling and Psychological Services (CAPS) (650-723-3785)—CAPS provides individual, couples, and group psychological counseling for students who experience a wide variety of personal, academic, and relationship concerns.

CAPS offers evaluations and brief counseling for registered students without charge. Students requesting or requiring longer, ongoing therapy incur fees. A CAPS on-call clinician may be contacted for urgent situations at any time.

CAPS strictly protects the confidentiality or information shared in counseling.

A team of specially trained staff is available (650-725-9955) to meet the needs of student survivors of sexual assault. CAPS offers workshops and groups that focus on the students’ social, personal, and academic effectiveness. Consultation and outreach services are provided for Stanford’s faculty, staff, and student organizations.

Health Promotion Services (650-723-0821)—Cowell assists students in their pursuit of optimal health, focusing on the positive lifestyle choices that can enhance their lives and contribute to their academic success. Health education workshops and seminars, community events, health advising, academic courses, student projects and internships, and a Health Library address the following issues: alcohol and other drug abuse prevention, nutrition counseling and education, sexual assault and harassment prevention, sexual health education, health enhancement, and self-care.

Student Health Insurance (650-723-2135)—All registered students are required to have health insurance. Cowell offers a comprehensive and affordable University-sponsored insurance plan, Cardinal Care, which is administered and insured by Blue Cross of California. Health insurance policies for spouses, domestic partners, children of students, and visiting scholars are available. Voluntary dental insurance is also offered.

HAAS CENTER FOR PUBLIC SERVICE

The Haas Center for Public Service serves as a focal point for students, faculty, and staff interested in public and community service. The Haas Center maintains and coordinates volunteer, internship, and community research opportunities for undergraduate and graduate students in the San Francisco Bay Area, nationally and internationally. Through the “study-service connections” initiative, the staff assists students and faculty seeking to integrate service-based learning with academic study and administers a Public Service Scholars honors research program.

The Haas Center is the campus base for Stanford in Washington, an academic program that combines seminars, tutorials, and internships in the nation’s capital. The center also houses student organizations including the Stanford Volunteer Network, Stanford in Government, the East Palo Alto/Stanford Summer Academy (EPASSA), and the You Can Make A Difference Conference. It administers numerous fellowship programs which provide financial support to students undertaking public and community service work during the summer and post-graduation. Through the center’s school programs, students serve East Palo Alto and Redwood City students as tutors, mentors, teaching assistants, and after school recreation leaders.

Students interested in public and community service internships, study-service connections, community research, volunteer work, and fellowships should visit the Haas Center or call (650) 723-0992.

BOOKSTORE

The Stanford Bookstore, consisting of six branches, is separate from the University. New and used textbooks and course readers are arranged by department on the Lower Level at the campus Bookstore in White Plaza. Other books, magazines, and study aids are located on all four levels. Apparel, school and office supplies, film and processing, stationery, souvenirs, a Clinique counter, and a café are on the Upper Level. Services include the shipping of purchases, gift certificates, an ATM machine, book buyback, fax, and the sale of stamps, and one-day campus parking permits. Microdisc, on the Mezzanine Level, meets computer hardware, software, and repair service needs; telephone: 1-800-533-2670.

The Track House Sports Shop, at the corner of Campus Drive and Galvez Street, sells sports apparel and equipment. Tresidder Express in
Tresidder Union offers snack foods, beverages, newspapers, health and beauty aids, and grocery items. The Stanford Bookstore, Palo Alto at 135 University Avenue, Palo Alto carries medical, technical, and business books. The University Shop in the Stanford Shopping Center, and the University Shop 2 at 250 University Avenue, Palo Alto, sell Stanford apparel and souvenirs.

CONFERENCE SERVICES

A "conference" is any student or adult group that is not a part of a regular or summer academic session for registered students, whether convening for only part of a day (including a luncheon), overnight, or for several days.

Arrangements for conferences are the responsibility of the Manager of Conferences. Summer Conference Services (650-723-3126) coordinates conferences from June 23 through September 15. Non-academic Facilities Scheduling in the Registrar's Office, (650) 723-6755, coor-dinates conferences September 16 through June 22. Policies concerning conferences are the responsibility of the President's and Provost's Offices.

Outside organizations wishing to meet at Stanford must have the sponsorship of a University department. Conferences initiated by organizations within or outside the University must be closely related to the academic program of the University. The sponsoring department submits its proposal to the Manager of Conferences for review in terms of available facilities and for approval of the President's Office.

Arrangements for campus housing and/or meeting room facilities are made with the Manager of Conferences.

Housing and dining service accommodations in campus residences usually are available on the Sunday following Commencement until August 31. Assistance with arrangements for tables, chairs, audiovisual aids, signs, and other equipment may be made with Summer Conference Services.

OMBUDSPERSON

The original charge for an ombudsperson at Stanford described the purpose of the office in this way: "The Ombudsperson's task is to protect the interests and rights of members of the Stanford community from injustices or abuses of discretion, from gross inefficiency, from unnecessary delay and complication in the administration of University rules and regulations, and from inconsistency, unfairness, unresponsiveness, and prejudice in the individual's experience with University activities. The Ombudsperson's office exists to receive, examine, and channel the complaints and grievances of members of the Stanford community, and to secure expedient and impartial redress."

Any troublesome matter in the University community may be discussed in confidence with the University Ombudsperson. Services of the office are available to students, staff, and faculty.

Although possessing no decision-making authority, the Ombudsperson has wide powers of inquiry. The Ombudsperson will refer matters to the proper person or office expeditiously and, where appropriate, assist in negotiations. (For the role of the office of the Ombudsperson in cases of sexual harassment, see the "Non-Academic Regulations" section of this bulletin.)

POLICE SERVICES

The Stanford Department of Public Safety, (650) 723-9633, is located at the corner of Campus Drive and Serra Street. It is composed of several divisions:

Deputized Patrol Officers: uniformed officers patrol the campus and respond to calls. They are fully empowered by Santa Clara County and have authority to stop vehicles, make arrests, and enforce all laws. Plain-clothes detectives follow up on cases as necessary.

Community Service Officers: CSOs enforce parking regulations. The citations they issue for parking violations are payable to Santa Clara County and go to warrant if not paid. The night CSOs check on building security and provide a uniformed presence.

The Special Services Unit: SSU is a campus resource center providing crime prevention and safety awareness programs to the Stanford community. Its free services include pamphlets, videos, and presentations about bicycle safety, earthquake preparedness (earthquake information, 723-0569), personal safety, and property protection. Call 723-0806 to reach the SSU.

For police, fire, or ambulance response at any time, dial 9-1-1, a free call from all pay phones. From University phones (723-, 725-, 497-, or 498-prefix), dial 9-911. Blue Emergency Phone Towers are now in place across campus for emergency assistance.

For additional safety information, see the Stanford Safety and Security Almanac, which is available from the Special Services Unit of the Stanford Department of Public Safety (723-0806).

STANFORD EVENTS

Stanford Events is responsible for the production of all official University ceremonies, including New Student Orientation Convocation, Founders' Day, Commencement, and other ceremonies or events as designated by the President's Office. Stanford Events also communicates University policies that govern events to campus organizations that request to host an event on or off campus. In addition, the Visitor Information Center, Stanford Ticket Office, and the Lively Arts at Stanford function within Stanford Events.

Organizations that may request use of University facilities for public events include academic departments, administrative offices, official organizations of the Association Students of Stanford University (ASSU), and voluntary student organizations registered with the Office of Student Activities (OSA). Voluntary student organizations sponsoring programs must have the approval of the ASSU student financial manager and the OSA before their requests are presented to the Registrar's Office for scheduling.

Copies of the Public Events Policy Manual, which sets forth University policies and procedures for events, are available from Stanford Events, 527 Lomita Mall, Stanford, CA 94305-2250, or at http://www.stanford.edu/dept/Events.

Stanford Ticket Office—the Stanford Ticket Office provides ticketing services including printing, sales, and box office staffing to Stanford University events, except athletics. The Ticket Office handles sales for Stanford Lively Arts, the Department of Music, and various campus organizations. BASS sales are also available through the Ticket Office for events in the greater Bay Area.

The Ticket Office is centrally located in the Tresidder Student Union and may be reached by phone at (650) 725-ARTS.

Stanford Lively Arts—Stanford Lively Arts presents a full season of professional, world-class music, dance, and theater performances from around the globe. Venues include Memorial Auditorium, Dinkelspiel Auditorium, Memorial Church, and Frost Amphitheater. For more information about Stanford Lively Arts and coming performances, telephone (650) 725-ARTS, or visit the Lively Arts web site at http://livelyarts.stanford.edu.

AWARDS AND HONORS

FACULTY AND STAFF

KENNETH M. CUTHBERTSON AWARD

The Kenneth M. Cuthbertson Award was established in 1981 for recognition of exceptional service to Stanford University. It was established...
by members of the faculty who wish to remain anonymous. All members of the Stanford community are eligible for the award; the sole criterion is the quality of the contribution that the recipients have made to the University. The award provides a way of honoring members of the staff and faculty for their efforts on behalf of the University.

Ordinarily, one award is made each year. The first award was made in 1981 to the person for whom it is named, Kenneth M. Cuthbertson, who was one of the early architects of Stanford's long-term financial planning and fundraising program. His service to Stanford has set an enduring standard for those who will come after him. The award is made annually at the University Commencement Ceremony.

LLOYD W. DINKELSPIEL AWARDS

The Lloyd W. Dinkelspiel Awards recognize distinctive and exceptional contributions to undergraduate education at Stanford University. The two principal awards are made to the faculty or staff members who have demonstrated superior work. The medal was established in memory of the Stanford University's greatest benefactor, Walter J. Gores, who served as a senior lecturer at Stanford University.

WALTER J. GORES AWARDS

The Walter J. Gores Faculty Achievement Awards for excellence in teaching were established by bequest of Walter J. Gores, Stanford Alumnus of the Class of 1917 and a professor at the University of Michigan for 30 years. Teaching is understood in its broadest sense and includes, in particular, lecturing, leading discussions, tutoring, and advising at the undergraduate or professional levels. Any member of the teaching staff of the University is eligible for an award, including all faculty of professorial rank, instructors, lecturers, teaching fellows, and teaching and course assistants. Ordinarily, awards are made to a senior faculty member (associate or full professor) or senior lecturer; a junior faculty member or member of the teaching staff; and a teaching assistant (graduate or undergraduate student). The awards are made annually at the University Commencement Ceremony.

ALLAN COX MEDAL FOR FACULTY EXCELLENCE FOSTERING UNDERGRADUATE RESEARCH

The Allan Cox Medal for Faculty Excellence Fostering Undergraduate Research is awarded annually to a faculty member who has established a record of excellence directing undergraduate research over a number of years. It may also go to a faculty member who has done an especially outstanding job with just one or two undergraduates who demonstrated superior work. The medal was established in memory of the former professor of Geophysics and Dean of the School of Earth Sciences, a strong supporter of faculty-student research collaboration.

HERBERT HOOVER MEDAL FOR DISTINGUISHED SERVICE

David Starr Jordan's firm belief that every academic degree should represent work actually done in or under the direction of the institution granting it has meant that, since its founding, Stanford has awarded no honorary degrees. As a means of recognizing extraordinary individuals who deserve special acknowledgment, the Stanford Alumni Association in 1962 voted to establish the Herbert Hoover Medal for Distinguished Service. The name pays tribute to the former President's example of service to his University, to his country, and to the cause of world humanitarianism. Indeed, Mr. Hoover was the first award recipient. The gold medal is presented following selection by an anonymous committee appointed by the Chair of the Board of Directors of the Alumni Association. There have been 11 honorees.

STUDENT

BOOTHE PRIZE FOR EXCELLENCE IN WRITING

Awarded during the freshman year, the Boothe Prize recognizes excellence in writing. Students are selected for this honor on the basis of essays written for courses fulfilling the Introduction to the Humanities requirement or in Writing and Critical Thinking. The prize is named for Mr. and Mrs. D. Power Boothe, Jr., whose gifts to the University reflect their interest in the humanities.

PRESIDENT'S AWARD FOR ACADEMIC EXCELLENCE IN THE FRESHMAN YEAR

The President's Award honors students who have exceptionally distinguished academic records that exemplify a strong program of study in the freshman year. Students eligible for the award normally have completed Writing and Critical Thinking and the Introduction to the Humanities requirement during their first year at Stanford.

DEANS' AWARD FOR ACADEMIC ACHIEVEMENT

The deans of Earth Sciences, Engineering, and Humanities and Sciences recognize from five to ten undergraduate students each year for their academic endeavors. Honorees are cited for noteworthy accomplishments which represent more than a high grade point average or success in course work. Faculty nominate students who have exceptional tangible achievements in classes or independent research, national academic competitions, a presentation or publication for a regional or national audience, or exceptional performance in the creative arts.

FIRESTONE MEDAL FOR EXCELLENCE IN RESEARCH

The Firestone Medal is awarded to seniors in recognition of excellence in undergraduate research. Departments in the School of Humanities and Sciences nominate students who have completed outstanding honors projects in the social, physical, and natural sciences.

ROBERT M. GOLDEN MEDAL FOR EXCELLENCE IN THE HUMANITIES AND CREATIVE ARTS

The Golden Medal recognizes outstanding achievement in the humanities and the creative arts. Seniors receive these medals upon nomination by their major department.

HOEFTER PRIZE FOR EXCELLENCE IN UNDERGRADUATE WRITING

The Hoefer Prize recognizes students and faculty for their work in courses that meet the University Writing Requirement for writing in the major. Prizes are awarded in each of the five areas of the undergraduate curriculum: humanities, social sciences, natural sciences, engineering, and earth sciences.

FREDERICK EMMONS TERNAN ENGINEERING SCHOLASTIC AWARD

The School of Engineering annually presents the Terman Award to seniors for outstanding academic achievement. The awardees share their award with a high school teacher of their nomination.

PHI BETA KAPPA

Phi Beta Kappa is a nationwide society honoring students for the excellence and breadth of their undergraduate scholarly accomplishments. Membership in the Stanford Chapter (Beta of California) is open to undergraduates of all majors. To be elected to Phi Beta Kappa at Stanford, a student must achieve academic distinction in the major as well as in courses across a broad range of fields.

Approximately one-tenth of the members of a graduating class are elected to Phi Beta Kappa. Of this number, about one fifth are chosen in their junior year, the remainder in their senior year.

The chapter's election guidelines define "breadth" of study as excellence beyond the major field. To be considered for election, a student must...
have taken, by the time elections are held early in the Spring Quarter, at least three courses in each of the following three major domains of knowledge: Humanities; Science, Engineering, and Math; and Social Sciences. To be considered for election, students who transfer in their junior year must have taken at least two courses at Stanford in two of the major domains and at least one course in the third domain, and must have completed a minimum of 75 units of academic work at Stanford by the end of Winter Quarter.

Examples of courses that will satisfy the Phi Beta Kappa breadth criterion include those listed in the Stanford Bulletin Appendix for the undergraduate General Education Requirements (GER) in Areas 2 to 4. Courses taken for GER Area 1 are not considered as satisfying the PBK undergraduate General Education Requirements (GER) in Areas 2 to 4.

A grade of ‘+’ or ‘CR’ is not considered a sign of distinction. Minimally satisfying the “breadth” criterion is not considered a sign of distinction.

The academic records of all students are automatically reviewed, so no special action is required for students wishing to be considered for membership. Anonymity in the election process is ensured by removal of the students’ names from their academic records before consideration. Students who desire that their records not be made available for consideration by the Stanford chapter of Phi Beta Kappa should inform the Registrar, room 133, Old Union.

EXCHANGE PROGRAMS AND CROSS-ENROLLMENT AGREEMENTS

Stanford has exchange programs and cross-enrollment agreements with a number of other colleges and universities. The purpose of these programs and agreements is to offer Stanford students courses and training that are not available in the Stanford curriculum.

EXCHANGE PROGRAMS

UNDERGRADUATE

Stanford has exchange programs with four colleges and universities that allow students to exchange schools for a quarter/semester or for a year, depending on the school. These programs are best suited to students in their junior year, when the major area of study has been determined. Stanford students register for zero units at Stanford during the quarter(s) in which they are attending another college or university and pay the regular Stanford tuition. Courses taken at the other institution are treated as transfer credit back to Stanford. Students should contact the Transfer Credit Evaluator in the Academic Standing Office to determine whether the courses taken through an exchange program may qualify for credit toward a Stanford degree. Only the number of units accepted in transfer, not the course titles or the grades received, are recorded on the Stanford transcript.

Exchange programs are currently available at three historically black institutions: Howard University in Washington D.C.; and Morehouse College and Spelman College in Atlanta, Georgia. The exchange program at Dartmouth College in Hanover, New Hampshire, focuses on Native American Studies. Further information is available at the Undergraduate Advising Center.

GRADUATE

The Exchange Scholar Program is open to doctoral students in the fields of humanities, social sciences, and sciences who have completed one full year of study at one of the participating institutions. These students may apply to study at Stanford for a maximum of one academic year to take advantage of particular educational opportunities not available on the home campus. The participating institutions are Brown University, University of Chicago, Columbia University, Cornell University, Harvard University, Massachusetts Institute of Technology, Princeton University, University of Pennsylvania, and Yale University. Further information on the program may be obtained from the Degree Progress Office, Old Union, or from the graduate dean’s office at participating institutions. Some institutions may place restrictions on specific departments.

Stanford also has separate exchange programs with the University of California, Berkeley and the University of California, San Francisco. Further information may be obtained at the Registrar’s Office.

CROSS-ENROLLMENT AGREEMENTS FOR ROTC

Stanford has cross-enrollment agreements for the Reserve Officers’ Training Corps (ROTC) with the Navy and the Marine Corps ROTC program at the University of California at Berkeley, the Army ROTC program at Santa Clara University, and the Air Force ROTC program at San Jose State University. The purpose of these agreements is to allow Stanford students to engage in military training while working on their degrees from Stanford. Courses taken in ROTC programs are offered by and through UC Berkeley, Santa Clara, and San Jose State. The courses do not qualify to be used towards the 12 unit requirement for full-time registration status or satisfactory academic progress requirements for Stanford undergraduates. Certain ROTC courses may be eligible to be used as transfer credit if they qualify under Stanford’s transfer credit practices.

Normally, students who participate in ROTC training complete a four-year course of instruction at the respective institution that consists of two years of basic courses during the freshmen and sophomore years, and an advanced course of instruction during the junior and senior years. Students who accept ROTC scholarships are generally subject to a service obligation, depending on the regulation of the particular service.

Stanford students who are enrolled in ROTC programs under the cross-enrollment agreements are eligible to compete for scholarships to include full tuition and a monthly stipend (Navy and Air Force), or other varying amounts (Army). Students normally compete for national scholarships as high school seniors, although current Stanford students may be eligible to enroll in ROTC on a non-scholarship basis. Non-scholarship ROTC students are eligible to compete for scholarships, and individual services may offer additional scholarship programs to current qualifying undergraduate and graduate students. Interested students should contact the appropriate military professor at the host institution to obtain information on these programs and to initiate application procedures (see below).

Students who satisfactorily complete an ROTC program and are awarded a Stanford degree qualify for a commission as a Second Lieutenant in the U.S. Army, an Ensign in the U.S. Navy, a Second Lieutenant in the U.S. Marines, or a Second Lieutenant in the U.S. Air Force.

For questions concerning the ROTC programs, Stanford students should consult one of the following: Naval ROTC, 152 Hearst Gym, UC-Berkeley, Berkeley CA 94720-3640, telephone (800) 430-3014; Army ROTC, Department of Military Science, Santa Clara University, Santa Clara, CA 95053, telephone (800) 227-7682; Air Force ROTC, San Jose State University, San Jose, CA 95192-0051, telephone (408) 924-2960.

COURSES

AIR FORCE ROTC

The following are offered by San Jose State University:


The Evolution of the United States Air Force Air and Space Power—Sophomore year.

Field Training—Sophomore year.

Air Force Leadership Studies—Junior year.
National Security Affairs/Preparation for Active Duty—Senior year.

Leadership Laboratory—Mandatory and complements the list above. During freshman and sophomore years, includes the study of Air Force customs and courtesies, drill and ceremonies, and military commands. During junior and senior year, it consists of advanced leadership experiences involving the planning and controlling of military activities of the cadet corps, the preparation and presentation of briefings, and other oral and written communications.

ARMY ROTC

The following are offered by Santa Clara University:

Fundamentals of Leadership and Management—Basic course. First and second year are designed for beginning students who want to qualify for entry into the Advanced Course in a normal progression. Introduces key terms needed to address the leadership challenges and problem-solving methods used in the Advanced Course. Communication skills are taught, practiced, and mastered, ensuring that students entering the Advanced Course are prepared to take charge of groups and organize the activities of the group in problem-solving exercises and labs. Associated extracurricular activities are: the leadership reaction course; a physically challenging confidence course, rappelling, marksmanship, and competitive orienteering.

The following are offered for the Army ROTC Basic Course:

Basic Leadership Development and Communicative Skills—Freshman year.

History of the U.S. Army Military Profession—Freshman year.

Applied Leadership Development—Freshman year.

Organizational Leadership Theory—Sophomore year.

Team Development—Sophomore year.

Troop Leading Procedures/U.S. Army—Sophomore year.

Advanced Leadership and Management—Advanced sophomores. This sequence is open to students who have completed the Basic Course or earned placement credit for it. Placement credit can be achieved through prior military training or completion of the six-week summer course known as Camp Challenge at Fort Knox, Kentucky. Students who want to qualify for the Advanced Course, via Camp Challenge, should plan to attend the camp as early as the summer before their junior year at Stanford. Students must complete the Advanced Course in the sequence prescribed by the Department of Military Science at Santa Clara University.

The following are offered for the Army ROTC Advanced Course:

Leading Small Organizations I—Junior year.

Leading Small Organizations II—Junior year.

Advanced Tactics—Junior year.

ROTC Advanced Camp—Junior year. Six-week summer camp. Open only to contracted students who have completed junior-year courses and who are seeking a commission in the U.S. Army.

Leadership Challenges and Goal Setting—Senior year.

Transition to Lieutenant—Senior year.

Precommissioning Seminar—Senior year.

NAVAL ROTC

The Department of Naval Science at UC Berkeley offers programs of instruction for men and women leading to active duty reserve commissions in the U.S. Navy or U.S. Marine Corps. Navy option students enrolled in one of the four-year programs normally complete the following courses during the first two years.

NS1. Introduction to Naval Science—Freshman year.

NS2. Sea Power and Maritime Affairs—Freshman year.

NS3. Leadership and Management—Sophomore year.

NA10. Ship Systems—Sophomore year.

Navy option students enrolled in either the four- or two-year program normally complete the following courses during their junior and senior years.

NS12A. Navigation and Naval Operations I—Junior year.

NS12B. Navigation and Naval Operations II—Junior year.

NS401. Naval Ship Systems—Senior year.

NS412. Leadership and Ethics—Senior year.

In addition to the above courses, Navy option ROTC students are required to participate in weekly professional development laboratories (drill) at UC Berkeley and complete a number of other courses at Stanford including one year of calculus, physics, and English, and one quarter of computer science, leadership and management, and military history or national security policy.

In lieu of NS401, NA10, and NS12B, Marine option students may participate in Marine Seminars and complete MA154, History of Littoral Warfare and MA20, Evolution of American Warfare (or a designated equivalent course). Marine option students also participate in the weekly professional development laboratories.
STATEMENT OF NONDISCRIMINATORY POLICY

Stanford University admits students of either sex and any race, color, religion, sexual orientation, or national and ethnic origin to all the rights, privileges, programs, and activities generally accorded or made available to students at the University. It does not discriminate against students on the basis of sex, race, age, color, disability, religion, sexual orientation, or national and ethnic origin in the administration of its educational policies, admissions policies, scholarships and loan programs, and athletic and other University-administered programs.

AMERICANS WITH DISABILITIES ACT/REHABILITATION ACT GRIEVANCE PROCEDURE

POLICY

Stanford University, in compliance with state and federal laws and regulations, including the Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973 (Section 504), does not discriminate on the basis of disability in administration of its education-related programs and activities, and has an institutional commitment to provide equal educational opportunities for disabled students who are otherwise qualified.

Students who believe they have been subjected to discrimination on the basis of disability, or have been denied access to services or accommodations required by law, have the right to use this grievance procedure.

For further information concerning policies and procedures for students with disabilities, see http://www.stanford.edu/dept/ocr/access/student.html, or the ADA/Section 504 Compliance Officer, Office of Campus Relations, Main Quad, Building 310, Mail Code 2100, (650) 723-3484 (Voice), (650) 723-1216 (TTY), (650) 723-1791 (Fax)

APPLICABILITY

The grievance procedure set forth below is applicable to undergraduate and graduate students of the University. In general, it is designed to address disputes concerning the following:
1. Disagreements regarding a requested service, accommodation, or modification of a University practice or requirement
2. Inaccessibility of a program or activity
3. Harassment or discrimination on the basis of disability
4. Violation of privacy in the context of disability

For disputes regarding certain specific academic accommodations or modification of academic requirements (such as reduction in the number of academic course units taken quarterly or yearly, requests for substitution of courses, or issues relating to academic standing), the alternate procedure set forth in Section V (C) of the Stanford University Policy and Procedure for Student Requests for Services and Accommodations should be followed. For questions regarding which procedure is applicable, contact one of the Compliance Officers at the Office of Campus Relations.

These two sets of procedures supplement the Statement on Student Academic Grievance Procedures (set forth in the Stanford Bulletin) for disability-related grievances.

COMPLIANCE OFFICERS

Stanford University's Compliance Officers are responsible for administering this grievance procedure as well as ensuring compliance with applicable laws. The designated Compliance Officers are: Rosa Gonzalez (ADA / Section 504 Compliance Officer) and the Director of the Office of Campus Relations. They have offices in Building 310 in the Main Quad and may be reached by calling (650) 723-3484, TTY 723-1216, fax 725-3326.

INFORMAL RESOLUTION/SECOND REVIEW

1. Prior to initiating the formal complaint procedure set forth below, and as a prerequisite to it, the student shall contact a Compliance Officer for assistance in resolving the matter informally within seven calendar days of the determination communicated by the DRC (if there was such a determination).

If the Compliance Officer is not successful in quickly achieving a satisfactory resolution (that is, generally within seven calendar days), the Compliance Officer will take the steps described in subparagraph "2" below.

2. Second Review Panel: in accordance with the dispute resolution procedures outlined in Section VII of the Stanford University Policy and Procedure for Student Requests for Services and Accommodations, the Compliance Officer will convene an ad-hoc second review panel to review the issue(s) raised. The panel will consist of the following (or their designees): the Compliance Officer reviewing the request, the Director of the DRC, the Dean of Students, and (depending upon the issues) such other academic or administrative personnel as may be appropriate. This panel will review the request, investigate, and attempt to resolve the issues within seven calendar days of the request for or initiation of a second review. No formal report need be issued by the panel, but the panel will document the outcome of its review in a letter to the student. If the student is not satisfied with the panel's disposition of the matter, the student may file a formal complaint in accordance with the procedure described below.

FORMAL COMPLAINT

If the procedure set forth above for informal resolution does not yield a successful resolution, then the student may file a formal complaint in the following manner:

1. When to File Complaint: complaints shall be filed within ten calendar days of the end of the informal resolution process described above.
2. What to File: a complaint must be in writing and include the following:
   a) The grievant's name, address, email address, and phone number
   b) A full description of the problem
   c) A statement of the remedy requested
   d) A copy of the letter from the Second Review Panel setting forth the outcome of the informal grievance procedure described above
3. Where to File Complaint: the complaint shall be filed with the Compliance Officer at the Office of Campus Relations, Building 310 (mail code 2040; fax 650-725-3326).
4. Notice of Receipt: upon receipt of the complaint, the Compliance Officer reviews the complaint for timeliness and appropriateness for this grievance procedure, and provides the grievant with written notice acknowledging its receipt.
5. Investigation: the Compliance Officer or his or her designee (hereafter collectively referred to as the "grievance officer") shall promptly initiate an investigation. In undertaking the investigation, the grievance officer may interview, consult with and/or request a written response to the issues raised in the grievance from any individual the grievance officer believes to have relevant information, including faculty, staff, and students.
6. Representation: the grievant and the party against whom the grievance is directed shall have the right to have a representative. The party shall indicate whether he or she is to be assisted by a representative and, if so, the name of that representative. For purposes of this procedure, an attorney is not an appropriate representative.
7. Findings and Notification: upon completion of the investigation, the grievance officer will prepare and transmit to the student, and to the party against whom the grievance is directed, a final report containing a summary of the investigation, written findings, and a proposed disposition. This transmission will be expected within 45 calendar days of the final investigation report.
days of the filing of the formal complaint. The deadline may be extended by the Compliance Office for good cause. The final report shall also be provided, where appropriate, to any University officer whose authority will be needed to carry out the proposed disposition or to determine whether any personnel action is appropriate.

8. Final Disposition: the disposition proposed by the grievance officer shall be put into effect promptly. The grievant or any party against whom the grievance or the proposed disposition is directed may appeal. The appeal to the Provost (as set forth below) will not suspend the implementation of the disposition proposed by the grievance officer, except in those circumstances where the Provost decides that good cause exists making the suspension of implementation appropriate.

URGENT MATTERS
Whenever the application of any of the time deadlines or procedures set forth in this grievance procedure creates a problem due to the nature of the complaint, the urgency of the matter, or the proximity of the upcoming event, the Compliance Officer will, at the request of the grievant, determine whether an appropriate expedited procedure can be fashioned.

REMEDIES
Possible remedies under this grievance procedure include corrective steps, actions to reverse the effects of discrimination or to end harassment, and measures to provide a reasonable accommodation or proper ongoing treatment. As stated above, a copy of the grievance officer's report may, where appropriate, be sent to University officer(s) to determine whether any personnel action should be pursued.

APPEAL
Within ten calendar days of the issuance of the final report, the grievant or the party against whom the grievance is directed may appeal to the Provost the grievance officer’s determination.

An appeal is taken by filing a written request for review with one of the Compliance Officers at the Office of Campus Relations, Building 170, Room 114 (mail code 2040; fax 650-725-3326).

The written request for review must specify the particular substantive and/or procedural basis for the appeal, and must be made on grounds other than general dissatisfaction with the proposed disposition. Furthermore, the appeal must be directed only to issues raised in the formal complaint as filed or to procedural errors in the conduct of the grievance procedure itself, and not to new issues.

The Compliance Officer shall forward the appeal to the Provost, and also provide copies to the other party or parties. The review by the Provost or his or her designee normally shall be limited to the following considerations:

1. Were the proper facts and criteria brought to bear on the decision or, conversely, were improper or extraneous criteria brought to bear on the decision?
2. Were there any procedural irregularities that substantially affected the outcome?
3. Given the proper facts, criteria, and procedure, was the decision a reasonable one?

A copy of the Provost's written decision will be expected within 30 calendar days of the filing of the appeal and shall be sent to the parties, the Compliance Officer and, if appropriate, to the University officer whose authority will be needed to carry out the disposition. The deadline may be extended by the Provost for good cause. The decision of the Provost on the appeal is final.

TITLE IX OF THE EDUCATION AMENDMENTS OF 1972
It is the policy of Stanford University to comply with Title IX of the Education Amendment of 1972 and its regulations, which prohibit discrimination on the basis of sex. The Title IX Compliance Officer is the Director of the Office of Campus Relations and has been appointed to coordinate the University's efforts to comply with the law. Anyone who believes that, in some respect, Stanford is not in compliance with Title IX and its regulations should contact the Title IX Compliance Officer, Office of Campus Relations, Main Quad, Building 310, Mail Code 2100, (650) 723-3484 (Voice), (650) 723-1216 (TTY), (650) 723-1791 (Fax).

OWNERSHIP AND USE OF STANFORD NAME AND TRADEMARKS
Stanford registered marks, as well as other names, seals, logos, and other symbols and marks that are representative of Stanford, may be used solely with permission of Stanford University. Items offered for sale to the public bearing Stanford’s names and marks must be licensed. For complete text of the currently applicable policy, including the University officers authorized to grant permission to use the Stanford name and marks, see Administrative Guide Memo 15.5, Ownership and Use of Stanford Name and Trademarks at http://www-portfolio.stanford.edu/105433.

COPYING PRINTED MATERIAL FOR TEACHING AND RESEARCH
Federal copyright law governs copying intellectual property such as books and articles, including the making of copies for teaching and research. It is each faculty member's responsibility to be aware of and abide by the law, and the Provost’s Office periodically issues memoranda reminding faculty and staff members of their responsibilities in this area. The memoranda, in addition, list those publishers with whom Stanford has an experimental photocopying license that permits Stanford faculty, staff, and students to make as many copies as they need of excerpts of any length (but not an entire book or issue of a periodical) in connection with the educational, research, or administrative functions of the University. For the most current information on this subject, faculty members should consult their department chair or the Provost’s Office.

DOMESTIC PARTNERS
In October 1990, Stanford University adopted a domestic partners policy. This policy, which implements the University’s nondiscrimination policy, makes services that have historically been available to married students available on an equal basis to students with same-sex or opposite-sex domestic partners. These services include access to student housing, a courtesy card that provides access to University facilities, and the ability to purchase medical care at Cowell Health Service. A domestic partnership is defined as an established long-term partnership with an exclusive mutual commitment in which the partners share the necessities of life and ongoing responsibility for their common welfare.

SEXUAL HARASSMENT
For the complete text of the currently applicable version of this policy, see Administrative Guide Memo 23.2, Sexual Harassment, at http://www-portfolio.stanford.edu/200034, which is also published in the Judicial Affairs Office website http://www.stanford.edu/dept/vpsa/judicialaffairs/index.html.

POLICY
Stanford University strives to provide a place of work and study free of sexual harassment, intimidation, or exploitation. It is expected that students, faculty, and staff will treat one another with respect.

All students, faculty, and staff are subject to this policy. Individuals who violate this policy are subject to discipline up to and including discharge, expulsion, or other appropriate sanction.

Reports of sexual harassment are taken seriously and will be dealt with promptly. The specific action taken in any particular case depends on the nature and gravity of the conduct reported, and may include intervention, mediation, investigation, and the initiation of grievance and disciplinary processes as discussed more fully below. Where sexual harassment is found to have occurred, the University will act to stop the harassment, act to prevent its recurrence, and discipline those responsible.
The University recognizes that confidentiality is important. Sexual harassment advisers and others responsible to implement this policy will respect the confidentiality and privacy of individuals reporting or accused of sexual harassment to the extent reasonably possible. Examples of situations where confidentiality cannot be maintained include circumstances when the University is required by law to disclose information (such as in response to legal process) and when disclosure is required by the University's outweighing interest in protecting the rights of others.

Reprisals against an individual who in good faith reports or provides information in an investigation about behavior that may violate this policy are against the law and will not be tolerated. Intentionally providing false information, however, is grounds for discipline.

Stanford is committed to the principles of free inquiry and free expression. Vigorous discussion and debate are fundamental to the University, and this policy is not intended to stifle teaching methods or freedom of expression generally, nor will it be permitted to do so. Sexual harassment, however, is neither legally protected expression nor the proper exercise of academic freedom; it compromises the integrity of the University, its tradition of intellectual freedom and the trust placed in its members.

WHAT IS SEXUAL HARASSMENT?

Unwelcome sexual advances, requests for sexual favors, and other visual, verbal, or physical conduct of a sexual nature constitute sexual harassment when:

1. It is implicitly or explicitly suggested that submission to or rejection of the conduct will be a factor in academic or employment decisions or evaluations, or permission to participate in a University activity; or
2. The conduct has the purpose or effect of unreasonably interfering with an individual's academic or work performance, or creating an intimidating or hostile academic, work, or student living environment.

Determining what constitutes sexual harassment depends upon the specific facts and the context in which the conduct occurs. Sexual harassment may take many forms—subtle and indirect, or blatant and overt. For example:

- It may be conduct toward an individual of the opposite sex or the same sex.
- It may occur between peers or between individuals in a hierarchical relationship.
- It may be aimed at coercing an individual to participate in an unwanted sexual relationship or it may have the effect of causing an individual to change behavior or work performance.
- It may consist of repeated actions or may even arise from a single incident if sufficiently egregious.

The University's Policy on Sexual Assault (see Stanford Administrative Guide Memo 23.3) may also apply when sexual harassment involves physical contact.

WHAT TO DO ABOUT SEXUAL HARASSMENT

The following are the primary methods for dealing with sexual harassment at Stanford. They are not required to be followed in any specific order. However, early informal methods are often effective in correcting questionable behavior.

CONSULTATION

Consultation about sexual harassment is available from the Sexual Harassment Advisers (including residence deans), human resources personnel, counselors at Counseling and Psychological Services (CAPS) or the Help Center, chaplains at Memorial Church, ombudspersons, and others. A list of Sexual Harassment Advisers is available in the brochure, Understanding Stanford's Sexual Harassment Policy. The brochure can be obtained from the Sexual Harassment Policy Office, Building 310, Main Quad, Room 201, Stanford, CA 94305, (650) 723-1583. The information contained in the brochure, including an up-to-date list of Sexual Harassment Advisers, is available on-line at http://www.stanford.edu/group/SexHarass. Consultation is available for anyone who wants to discuss issues related to sexual harassment, whether or not "harassment" actually has occurred, and whether the person seeking information is a complainant, a person who believes his or her own actions may be the subject of criticism (even if unwarranted), or a third party.

Often there is a desire that a consultation be confidential or "off the record." This can usually be achieved when individuals discuss concerns about sexual harassment without identifying the other persons involved, and sometimes even without identifying themselves. Confidential consultations about sexual harassment also may be available from persons who, by law, have special professional status, such as counselors at Counseling and Psychological Services (CAPS) or the Help Center, chaplains at Memorial Church, and University and Medical Center ombudspersons. In these latter cases, the level of confidentiality depends on what legal protections are held by specific persons receiving the information and should be addressed with them before specific facts are disclosed.

DIRECT COMMUNICATION

An individual may act on concerns about sexual harassment directly, by addressing the other party in person, or writing a letter describing the unwelcome behavior and its effect, and stating that the behavior must stop. A Sexual Harassment Adviser can help the individual plan what to say or write, and likewise can counsel persons who receive such communications. Reprisals against an individual, who in good faith initiates such a communication, violate this policy.

THIRD PARTY INTERVENTION

Depending on the circumstances, third party intervention in the workplace, student residence, or academic setting may be attempted. Third party interveners may be the Sexual Harassment Advisers, human resources professionals, the ombudspersons, other faculty or staff, or sometimes mediators unrelated to the University.

When third party intervention is used, typically the third party will meet privately with each of the persons involved, try to clarify their perceptions, and attempt to develop a mutually acceptable understanding that can assure that the parties are comfortable with their future interactions. Other processes, such as a mediated discussion among the parties or with a supervisor, may also be explored in appropriate cases.

Possible outcomes of third party intervention include explicit agreements about future conduct, changes in workplace assignments, substitution of one class for another, or other relief, where appropriate.

FORMAL GRIEVANCE AND DISCIPLINARY PROCESSES

Grievance, appeal, or disciplinary processes may be pursued as applicable.

The applicable procedure depends on the circumstances and the status of the person bringing the charge and the person against whom the charge is brought. Generally, the process consists of the individual's submission of a written statement, a process of fact-finding or investigation by a University representative, followed by a decision and, in some cases, the possibility of one or more appeals, usually to Stanford administrative officers at higher levels. The relevant procedure (see below) should be read carefully, since the procedures vary considerably.

If the identified University fact-finder or grievance officer has a conflict of interest, an alternate will be arranged, and the Sexual Harassment Policy Office can help assure that this occurs.

In most cases, grievances and appeals must be brought within a specified time after the action complained of. While informal resolution efforts will not automatically extend the time limits for filing a grievance or appeal, in appropriate circumstances the complainant and the other relevant parties may mutually agree in writing to extend the time for filing a grievance or appeal.

Following is a list of the established grievance and appeal procedures. Many of the current versions are most reliably available on-line. Copies may also be obtained from the Sexual Harassment Policy Office.

Grievance Procedure for Academic Staff-Librarians: Section IV of the booklet, Personnel Program, Academic Staff-Libraries (January 1, 1989), available from the Library Human Resources Office in Sweet Hall.
Grievance Procedure for Academic Staff—Teaching: http://portfolio.stanford.edu/105742
Grievance Procedure for Academic Staff—Research: http://portfolio.stanford.edu/105210
Staff, Bargaining Unit: Collective Bargaining Agreements for unit members, Article 1c at http://hrweb/information/usw.html
Faculty Appeal Procedures: http://portfolio.stanford.edu/80/105738
Student Non-academic Grievance Procedure pursuant to Title IX: for additional information, consult the Director of the Office for Multicultural Development, who serves as the University’s Title IX Officer, http://www.stanford.edu/group/OMD

In appropriate cases, disciplinary procedures may be initiated. The applicable disciplinary procedure depends on the status of the individual whose conduct is in question. For example, faculty are subject to the Statement on Faculty Discipline and students to the Fundamental Standard.

PROCEDURAL MATTERS
INVESTIGATIONS
If significant facts are contested, an investigation may be undertaken. The investigation will be conducted in a way that respects, to the extent possible, the privacy of all of the persons involved. In appropriate cases, professional investigators may be asked to assist in the investigation. The results of the investigation may be used in the third party intervention process or in a grievance or disciplinary action.

RECORD KEEPING
The Sexual Harassment Policy Office will track reports of sexual harassment for statistical purposes and report at least annually to the University President concerning their number, nature, and disposition.

In the other instances (third party intervention, grievances, and disciplinary actions), the Sexual Harassment Policy Office may keep confidential records of reports of sexual harassment and the actions taken in response to those reports, and use them to identify individuals or departments likely to benefit from training so that training priorities can be established. No records will be retained in cases where the individual accused was not informed that there was a complaint.

COSTS
California law provides, in part, "an employer shall indemnify its employee for all that the employee necessarily expends or loses in direct consequence of the discharge of his or her duties as such ...". The issue of indemnification obviously turns on the facts and circumstances of each situation. On the other hand, individuals who violate this policy and/or their schools, institutes, or other units may be required to contribute to any costs and expenses incurred as a result of behavior that is wrongful and/or contrary to the discharge of an employee’s duties.

RESOURCES FOR DEALING WITH SEXUAL HARASSMENT
Persons who have concerns about sexual harassment should contact any Sexual Harassment Adviser listed in the brochure, or the Sexual Harassment Policy Office. Reports should be made as soon as possible: the earlier the report, the easier it is to investigate and take appropriate remedial action. When reports are long delayed, the University will try to act to the extent it is reasonable to do so, but it may be impossible to achieve a satisfactory result after much time has passed.

Likewise, anyone who receives a report or a grievance involving sexual harassment should promptly consult with a Sexual Harassment Adviser.

There are a number of individuals specially trained and charged with specific responsibilities in the area of sexual harassment. In brief:

Sexual Harassment Advisers—Sexual Harassment Advisers serve as resources to individuals who wish to discuss issues of sexual harassment, whether because they have been harassed or because they want information about the University’s policy and procedures. There is usually at least one adviser assigned to each of the schools at the University and to each large work unit; the residence deans also have been appointed as Sexual Harassment Advisers.

Director of the Sexual Harassment Policy Office—He/she is responsible for the implementation of this policy; provides advice to individuals when requested; supervises the other advisers; encourages and assists prevention education for students, faculty, and staff; keeps records showing the disposition of complaints; and generally coordinates matters arising under this policy. Because education and awareness are the best ways to prevent sexual harassment, developing awareness, education and training programs, and publishing informational material are among the most important functions of the Sexual Harassment Policy Office.

As indicated earlier, individuals with concerns about sexual harassment may also discuss their concerns informally with psychological counselors (for example, through CAPS or the HELP Center), chaplains (through the Memorial Chapel), or University or Medical School ombudspersons.

EXTERNAL REPORTING
Sexual harassment is prohibited by state and federal law. In addition to the internal resources described above, individuals may pursue complaints directly with the government agencies that deal with unlawful harassment and discrimination claims, for example, the U.S. Equal Employment Opportunity Commission (EEOC), the Office for Civil Rights (OCR) of the U.S. Department of Education, and the State of California Department of Fair Employment and Housing (DFEH). These agencies are listed in the Government section of the telephone book.

NOTE ON CONSENSUAL RELATIONSHIPS
There are special risks in any sexual or romantic relationship between individuals in inherently unequal positions (such as teacher and student, supervisor and employee, or student resident and the individual who supervises the day-to-day student living environment). Parties in such a relationship assume those risks. Such relationships may undermine the real or perceived integrity of the supervision and evaluation provided, and the trust inherent particularly in the student-faculty relationship. They may, moreover, be less consensual than the individual whose position confers power believes. The relationship is likely to be perceived in different ways by each of the parties to it, especially in retrospect.

Moreover, such relationships may harm or injure others in the academic or work environment. Relationships in which one party is in a position to review the work or influence the career of the other may provide grounds for complaint when that relationship gives undue access or advantage, restricts opportunities, or creates a hostile environment for others. Furthermore, circumstances may change, and conduct that was previously welcome may become unwelcome. Even when both parties have consented at the outset to a romantic involvement, this past consent does not remove grounds for a charge based upon subsequent unwelcome conduct.

POLICY REVIEW AND EVALUATION
This policy went into effect on October 6, 1993, and was amended on November 30, 1995. It is subject to periodic review, and any comments or suggestions should be forwarded to the Sexual Harassment Policy Office.

POLICY REFERENCE RESOURCES
A brochure containing the policy, a list of current sexual harassment advisers, confidential resources, and other helpful information is available on-line at http://www.stanford.edu/group/SexHarass/, and in print.
POLICY ON SEXUAL ASSAULT


Background—Stanford University’s policy and procedures on sexual harassment are published in Administrative Guide Memo 23.2 and are republished annually in the Stanford Bulletin and elsewhere. This statement supplements them, providing Stanford University’s policy and procedures specifically concerning sexual assault. This statement has been enacted by Stanford University in accordance with California State Law, Assembly Bill 3098, Postsecondary Education: Student Safety, July, 1990.

Definition—For the purposes of this statement by the University, “sexual assault” includes, but is not limited to, rape, forced sodomy, forced oral copulation, rape by a foreign object, sexual battery, or threat of sexual assault.

Policy—Sexual assault by force or coercion, including deliberate coercion through the use of drugs or alcohol, is absolutely unacceptable at Stanford University. Any member of the Stanford community who commits sexual assault at or on the grounds of the University, or at any of the University’s off-campus facilities or activities, or at the facilities or activities of any affiliated student organization, will face maximal institutional sanctions, in addition to any prosecutions external authorities may undertake. Stanford University is committed to providing information on services, resources, and treatment available to victims of sexual assault.

Notification—With the consent of the victim, charges of sexual assault received by University offices or personnel shall be communicated promptly to the Department of Public Safety, 711 Serra Street, telephone (9)-911 for emergency response or (650) 723-9633 during normal business hours, or, in the case of a student, to the sexual assault response team at Counseling and Psychological Services (CAPS) at Cowell Student Health Center, 606 Campus Drive, telephone 723-3785.

Legal Reporting Requirements—Health care professionals are expected to fulfill legally mandated reporting requirements.

Emergency Services Available to Victims—Victims of sexual assault are urged to seek immediate attention from emergency police, medical, and counseling services. On the Stanford campus and in the immediate vicinity, the following provide 24-hour response and will arrange for police assistance, medical assistance, emotional support services, and advocacy and support:

“911” Emergency Network: dial 9-911 from University phones or 911 from outside phones
Santa Clara Valley Medical Center, 751 South Bascom Avenue, San Jose, telephone (408) 299-5311
Mid-Peninsula Rape Crisis Center, 4161 Alma Street, Palo Alto, telephone (650) 493-RAPE

Sexual Assault Response Team (CSART), for students, at the Cowell Student Health Center, telephone (650) 723-3785
Stanford University Hospital, 300 Pasteur Drive, Stanford, telephone (650) 723-5111

Non-Emergency Resources—Additional resources for students are available at Cowell Student Health Center (650-723-3785), including short-term counseling, referral to long-term therapy, follow-up pregnancy testing, and testing and treatment for sexually transmitted diseases. Additional services for faculty and staff are available at the University’s HELP Center, Galvez House (723-4577), including general counseling, information, support, and referral. The University ombudsperson (723-6494) is available to all in the Stanford community for general counseling, advice, and advocacy.

Ongoing Case Management Procedures—Both informal procedures and formal grievance procedures for case management of sexual assault charges are given in the University’s policy on Sexual Harassment appearing as Administrative Guide Memo 23.2 and published annually in the Stanford Bulletin. Victims are to be kept informed by those responsible for those procedures of the status of any disciplinary proceedings and the results of any disciplinary action or appeal, providing that the victim agrees in advance, in writing, to treat this information as confidential. The offices of the Dean of Students are available to help student victims deal with academic difficulties that may arise because of the victimization and its impact.

Information Requests and Confidentiality—The University offices responding to charges of sexual assault have established protocols for protecting confidentiality and for handling inquiries from the press, concerned students, and parents.

Information about Options—The University offices responding to charges of sexual assault will inform victims, at a minimum, of the options of: criminal prosecution, civil prosecution, the disciplinary process, the appropriate grievance procedure, the availability of mediation, alternative housing assignments, and academic assistance alternatives.

POLITICAL ACTIVITIES

For the complete text of the currently applicable version of this policy, see Administrative Guide Memo 15.1, Political Activities, at http://www-portfolio.stanford.edu/200007.

Stanford University, as a charitable entity, is subject to federal, state, and local laws and regulations regarding political activities—campaign activities, lobbying, and the giving of gifts to public officials.

While all members of the University community are naturally free to express their political opinions and engage in political activities to whatever extent they wish, it is very important that they do so only in their individual capacities and avoid even the appearance that they are speaking or acting for the University in political matters.

In the limited circumstances where individuals must speak or act on behalf of the University in the political arena, they must do so in accordance with the provisions of this Guide Memo.

1. Summary of Legal Requirements and Restrictions
   a) Campaign Activities: contributions of money, goods, or services to candidates for political office and in support of or opposition to ballot measure campaigns are subject to a wide variety of political laws. Depending on the jurisdiction and the campaign, political contributions may be prohibited or limited and, in nearly all cases, are subject to a complicated series of disclosure rules. Because of the University’s tax-exempt status, the University is legally prohibited from endorsing candidates for political office or making any contribution of money, goods, or services to candidates. It is important, therefore, that no person inadvertently cause the University to make such a contribution.
   b) Lobbying: lobbying can generally be described as any attempt to influence the action of any legislative body (for example, Congress, state legislatures, county boards, city councils, and their staffs) or any federal, state, or local government agency. Laws regulating lobbying exist at the federal, state, and local
2. Prohibited and Restricted Political Activities

d) Reporting of Political Activities: the University must report on matters under their jurisdiction—may lobby on behalf of the University without specific authorization:

- President
- Provost
- Deans of the Seven Schools
- Vice Provost and Dean of Research
- Vice President for Business Affairs and Chief Financial Officer
- Vice President for Faculty and Staff Services
- Director of the Stanford Linear Accelerator Center
- Director of the Hoover Institution
- General Counsel
- Director of Government and Community Relations

The Vice Provost and Dean of Research may grant permission to faculty members to lobby on behalf of the University for specific purposes. The Director of Government and Community Relations may grant permission to staff members to lobby on behalf of the University for specific purposes. All lobbying on behalf of the University should be coordinated with the Director of Government and Community Relations.

c) Giving of Gifts to Public Officials and Staff: almost all jurisdictions have strict rules on the extent to which gifts and honoraria may be given to public officials (both elected and non-elected officials and, often, staff). In some cases gifts and honoraria are prohibited; in others they are limited; and in most cases they are subject to detailed disclosure. In addition, in some jurisdictions such as California, gifts to both state and local public officials can result in a public official’s disqualification from participation in any governmental action affecting the interests of the donor. Meals, travel, and entertainment are the most common types of gifts, but gift rules can also apply in cases where public officials attend a reception or receive tickets to sporting or other events.

As a non-profit organization, the University generally does not give gifts to public officials and, in those limited cases where it does give such gifts, it must do so in accordance with all applicable laws and regulations. Therefore, any University employee who, on behalf of the University, wishes to make a gift to a public official must receive prior approval from the Director of Government and Community Relations before making such a gift.

d) Reporting of Political Activities: the University must report most of its political activities above certain thresholds. Therefore, any University employee engaging in such activities on behalf of the University should carefully review the remainder of this Guide Memo and should discuss the relevant activities in advance with the Director of Government and Community Relations.

2. Permissible Activities

a) In General:

1) No person may, on behalf of the University, engage in any political activity in support of or opposition to any candidate for elective public office (including giving or receiving funds or endorsements), nor shall any University resources be used for such purpose.

2) No person may, on behalf of the University, lobby (or use University resources to lobby) any federal, state, or local legislative or administrative official or staff member unless specifically authorized to do so. Any lobbying activity, even when authorized, must be conducted in compliance with this Guide Memo, other applicable University policies, and applicable law.

3) No person may, on behalf of the University, give a gift (or use any University resources to give a gift) to any federal, state, or local official or staff member, except in compliance with this Guide Memo, other applicable University policies, and applicable law.

4) No person supporting candidates for public office or engaging in other political activities may use University space or facilities or receive University support, except in the limited ways described in section 3A, below.

5) No person may use for lobbying activities federally-funded contract or grant money received by the University.

Even the foregoing activities that are only restricted, rather than prohibited, may be subject to limitations imposed by law. Therefore, any person engaging in the activity, or contemplating doing so, should consult with the Director of Government and Community Relations.

b) Guidelines for Avoiding Prohibited Partisan Political Activities: the following guidelines should assist in preventing the involvement or apparent involvement of the University in political activities in support of or opposition to any candidate for elective public office, that is, partisan political activities. Except in the limited circumstances set forth in section 3B., below:

1) Use of Name and Seal: neither the name nor seal of the University or of any of its schools, departments, or institutions should be used on letters or other materials intended for partisan political purposes.

2) Use of Address and Telephones: no University office should be used as a return mailing address for partisan political mailings, and telephone service that is paid by the University, likewise, should not be used for partisan political purposes. (Obviously, a student’s dormitory room and telephone service that are personal to the student may be used for these purposes.)

3) Use of Title: the University title of a faculty or staff member or other person should be used only for identification and should be accompanied by a statement that the person is speaking as an individual and not as a representative of the University.

4) Use of Services and Equipment: University services, such as Interdepartmental Mail; equipment, such as duplicating machines, computers, and telephones; and supplies should not be used for partisan political purposes.

5) Use of Personnel: no University employee may, as part of his or her job, be requested to perform tasks in any way related to partisan political purposes.

3. Permissible Activities

a) In General: as noted above, the federal, state, and local laws which limit the partisan political activities that can take place in University facilities and with University support in no way inhibit the expression of personal political views by any individual in the University community. Nor do they forbid faculty, students, or staff from joining with others in support of candidates for office or in furtherance of political causes. There is no restriction on discussion of political issues or teaching of political techniques. Academic endeavors which address public policy issues are in no way affected.

Because the University encourages freedom of expression, political activities which do not reasonably imply University involvement or identification may be undertaken so long as regular University procedures are followed for use of facilities. Examples of permissible activities are:

1) Use of areas, such as White Plaza, for tables, speeches, and similar activities.

2) Use of auditoriums for speeches by political candidates, but subject to rules of the Internal Revenue Service, the Federal Election Commission, and the California Fair Political Practices Commission, and other applicable laws. Arrangements must
be made with University Events and Services. (See also Guide Memo 82.1, Public Events, for more information.)

To reiterate, because tax and political compliance laws impose restrictions, and even prohibitions, on certain political activities and on the use of buildings and equipment at a non-profit institution such as the University, any such activities must be in compliance with these legal requirements. Individuals taking political positions for themselves or groups with which they are associated, but not as representatives of the University, should clearly indicate, by words and actions, that their positions are not those of the University and are not being taken in an official capacity on behalf of the University.

b) Limited University Political Activities: limited activities relating to specific federal, state, or local legislation or ballot initiatives are permissible where (1) the subject matter is directly related to core interests of the University’s activities; (2) the President has determined that the University should take a position; and (3) the individuals who speak or write on the University’s behalf are specifically authorized to do so.

4. Responsibility for Interpretation: the Director of Government and Community Relations, in consultation with the General Counsel, is the administrative officer responsible for interpretation and application of the above guidelines. Questions on whether planned student activities are consistent with the University’s obligations should be directed to the Dean of Students, who will consult with the Director of Government and Community Relations and/or the General Counsel.

All other questions on whether planned activities are consistent with the University’s obligations should be addressed directly to the Director of Government and Community Relations or the General Counsel.

CAMPUS DISRUPTION

The University’s policy on campus disruption applies to students, faculty, and staff. It is published in its complete form in the Administrative Guide and on the Judicial Affairs Office website at http://www.stanford.edu/dept/vpsa/judicialaffairs/index.html. It states:

Because the rights of free speech and peaceable assembly are fundamental to the democratic process, Stanford firmly supports the rights of the University community who have reasonable grounds to believe that the University should take a position; and with the University’s obligations should be addressed directly to the Director of Government and Community Relations or the General Counsel.

It is a violation of University policy for a member of the faculty, staff, or student body to (1) prevent or disrupt the effective carrying out of a University function or approved activity, such as lectures, meetings, interviews, ceremonies, the conduct of University business in a University office, and public events; (2) obstruct the legitimate movement of any person about the campus or in any University building or facility.

The following regulations are intended to reconcile these objectives.

A. Except for authorized academic purposes, the knowing possession by any student on any Stanford campus of the following is prohibited: firearms, explosives, or any instrument or weapon of the kind commonly known as blackjack, slingshot, billy club, sandclub, sandbag, or metal knuckles.

B. Notwithstanding paragraph (A) above, a student who is a resident of a Stanford campus may store a weapon on such campus if both of the following conditions are met:

1) The student has complied with all state and federal regulations regarding the use and possession of said weapon, or, in the case of a foreign campus, with the laws of the country in which the campus is located.

2) The student stores such weapons with the Stanford Department of Public Safety (SDPS) or, in the case of a foreign campus, in a facility provided by the director of such campus.

C. Students may remove their weapons from storage only in accordance with regulations established by the SDPS or by the director of the foreign campus at which the weapon is stored. A student who is a resident of a Stanford campus may bring any of the above weapons on campus for purposes of storage only if the student has previously notified the SDPS of the intention to do so, but in no event more than six hours after arrival on the campus. When the student removes the weapon from storage, it must be taken off campus as soon as is practical, but in no event more than one hour after such removal.

D. The term “Stanford campus” shall include all the lands and facilities of Leland Stanford Junior University, whether owned or leased, and whether located in the United States or abroad.

CONTROLLED SUBSTANCES AND ALCOHOL

The University’s policy on controlled substances and alcohol is published in its complete form in the Administrative Guide and the Judicial Affairs Office website http://www.stanford.edu/dept/vpsa/judicialaffairs/index.html.

INTRODUCTION

Student conduct is guided by the Fundamental Standard. Implicit in the Standard is the understanding that students are responsible for making their own decisions and accepting the consequences of those decisions.

In order to make informed decisions about alcohol and other drug use, students should educate themselves about the health and safety risks associated with their use, as well as about state and local laws on possessing, serving, and consuming alcohol. It is widely recognized that the misuse and abuse of drugs ("controlled substances") and the abuse of alcohol are major contributors to serious health problems, as well as to social and civic concerns. Among the health risks associated with the use
of illicit drugs and the abuse of alcohol are various deleterious physical and mental consequences including dependency, severe disability—even death. Information concerning the known effects of alcohol and specific drugs is available from the Alcohol and Other Drug Abuse Prevention Program at Cowell Student Health Service.

The goal of this Policy is to reduce the abuse and illegal use of alcohol and other drugs, and the human and material costs associated with it. The University, as an educational institution, approaches student conduct issues from a perspective that places emphasis on individual responsibility and development. Education about and prevention of alcohol and other drug-related problems will continue to be the primary emphasis and goal. However, the University expects students, as individuals and as members of groups, to conduct themselves in accordance with this and all other University policies governing student conduct.

Individuals who violate the University's terms and conditions for student conduct and/or use of controlled substances or the unlawful possession, use, or distribution of alcohol is prohibited on the Stanford campus, in the workplace, or as part of any of the University's activities. The workplace and campus are presumed to include all Stanford premises where the activities of the University are conducted. Violation of this policy may result in disciplinary sanctions up to and including termination of employment or expulsion of students. Violations may also be referred to the appropriate authorities for prosecution. This policy will be reviewed at least biennially.

The University will continue to comply with all applicable state and federal laws, including the Americans with Disabilities Act.

**SOME APPLICATIONS**

No University funds or funds collected by the University may be used in a way that violates the alcohol policy. In student residences, house funds (funds collected by the University Bursars or other University offices) may not be used to buy alcohol because the majority of undergraduates are under the legal drinking age of 21. The decision to use student-collected funds to buy alcohol should be made lawfully, thoughtfully, fairly, and in a way that respects the views of all students. Students must not be required to contribute to a student-collected fund for the purposes of purchasing alcohol.

Party planners are responsible for planning and carrying out events in compliance with this policy. At least one house or organization officer must assume responsibility for an event's compliance with the policy, and their names must be made available to Stanford's Department of Public Safety and the University upon request.

**CONSEQUENCES OF VIOLATION**

Educational and rehabilitative measures will be the preferred response to infractions of the Policy unaccompanied by more egregious misconduct. Penalties are calibrated according to the severity of the violation. Misbehavior associated with drug or alcohol use and abuse may result in one or more of the following University consequences:

- Individuals who violate the University Residence Agreement may lose their University student housing privileges and/or be reported to the Judicial Affairs Office.
- Individuals who violate the University’s terms and conditions for student organization recognition as defined in the Student Organization Handbook may be subject to expulsion from the student organization.
- Student groups which violate the Policy may face suspension of social privileges, as well as the loss of University recognition, meeting space, and housing or other related privileges.
- Students should understand that inebriation is never an excuse for misconduct, that the careless or willful reduction, through the use of alcohol or other intoxicants, of their own ability to think clearly, exercise good judgment, and respond to rational intervention may invoke more stringent penalties than otherwise might be levied.

Penalties will be imposed according to the facts and circumstances of each case. They can be imposed singly or in combination by the Office of Residential Education/Graduate Residences, the Office of Student Activities, the Dean of Students Office, and the Office of Judicial Affairs.

**CIVIL LIABILITY**

While the law regarding civil liability is complex, it is important to know that under some circumstances party hosts, sponsors, bartenders, or others might be held legally liable for the consequences of serving alcohol to underage drinkers or to obviously intoxicated persons. Social hosts or party planners could be sued and found personally responsible for damages to the injured party(ies) including:

- Specific damages. These are damages which are measurable. For example, when bodily injury results in medical expenses or lost wages.
- General damages. These are damages which cannot be specifically measured in terms of dollar amount. For example, pain and suffering resulting from bodily injury.
- Punitive damages. These are damages which are intended to serve as an example to others and to discourage behavior which is deemed highly undesirable to society.

**CRIMINAL LIABILITY**

Stanford University is not a sanctuary from the enforcement of state and local laws. Students and others on campus who violate the law may be and have been arrested and prosecuted. Primary responsibility for law enforcement, including that related to alcohol, rests with law enforcement agencies, primarily the Stanford Police Department. Uniformed officers who patrol the campus and respond to calls are deputized by the Sheriff of Santa Clara County and are fully empowered and authorized to stop vehicles, make arrests, and enforce all laws. Laws are subject to change; consequently, the following information is illustrative but must not be relied on as a complete and current citing of relevant laws. More information is available at the Stanford Department of Public Safety, 711 Serra Street.

Generally, it is a criminal offense:

1. To provide any alcoholic beverage to a person under 21.
2. To provide any alcoholic beverage to an obviously intoxicated person.
3. For any person under age 21 to purchase alcohol.
4. To be under the influence of alcohol or another drug in a public place and unable to exercise care for one's own safety or that of others.
5. For persons under 21 to possess alcohol in any public place or any place open to the public (for example, public places in student residences).
6. To operate a motor vehicle while under the influence of alcohol or any other drug. Presumed to be driving under the influence (DUI) with a blood alcohol level (BAL) of 0.08% or higher.
7. To ride a bicycle while under the influence of alcohol, drugs, or both.
8. To have an open container of alcohol in a motor vehicle; and, for persons under 21 to drive a vehicle carrying alcohol or to possess alcohol while in a motor vehicle.
9. To have in one's possession, or to use, false evidence of age and identity to purchase alcohol.
10. To possess an open container of alcohol in a public place or any place open to the public. Applies in Palo Alto jurisdiction.
11. To be in possession of an unregistered keg. All kegs sold must be registered at the time of purchase. Identification tags must be placed on all kegs in order to allow kegs to be traced if the contents are used in violation of the law.

**WHERE TO GET HELP**

In the event of a life threatening emergencies call 9-911 from on-campus and 911 from off-campus.

_Campus Resources—(Area Code 650.) Counseling and Psychological Services, 24 hours (723-3785); The Alcohol and Other Drug Abuse Prevention Program (723-3429); Stanford Alcohol and Drug Treatment Center (723-6682); Cowell Student Health Center’s Medical Advice_
The Alcohol and Other Drug Abuse Prevention Program at Cowell: provides information and referral, educational trainings and workshops, and non-clinical consultations for groups and individuals. The program utilizes a harm reduction approach to prevent problems associated with the use of alcohol, tobacco, and other drugs (723-3429).

The Office of Student Activities at Tresidder Memorial Union: provides workshops and training, publications, and party planning consultations. Web site: http://www-portfolio.stanford.edu/200141.

Community Resources—The National Council for Alcoholism and Drug Dependency, 24-hour hotline (408) 292-9945, Alcoholics Anonymous (650) 573-6811 or (408) 297-3555, Al-Anon (650) 873-2356 or (408) 379-1051, Cocaine Anonymous (800) 234-0420 or (408) 374-8009, Narcotics Anonymous (650) 572-3257 or (408) 298-4200.

SMOKE-FREE ENVIRONMENT


Applicability—This policy applies to all academic and administrative units of Stanford University, including SLAC, and all campus student housing. This policy does not supersede more restrictive policies which may be in force in compliance with federal, state, or local laws or ordinances.

Policy—It is the policy of Stanford University that the smoking of tobacco products in enclosed buildings and facilities and during indoor or outdoor events (and the selling of tobacco products) on the campus is prohibited.

Guidelines—Specifically, smoking is prohibited in classrooms and offices, all enclosed buildings and facilities, in covered walkways, in University vehicles, during indoor and outdoor athletic events, and during other University sponsored or designated indoor or outdoor events.

Ashtrays will not be provided in any enclosed University building or facility. “Smoking Prohibited” signs will be posted.

Smoking is permitted in outdoor areas, except during organized events. Outdoor smoking areas should be located far enough away from doorways, open windows, covered walkways, and ventilation systems to prevent smoke from entering enclosed buildings and facilities. To accommodate faculty, staff, and students who smoke, Vice Presidents, Vice Provosts, and Deans may designate certain areas of existing courtyards and patios as smoking areas in which case ashtrays must be provided. Costs associated with providing designated smoking areas and ashtrays will be absorbed by the specific academic or administrative unit(s).

Enforcement—This policy relies on the consideration and cooperation of smokers and non-smokers. It is the responsibility of all members of the University community to observe and follow this policy and its guidelines.

Smoking cessation programs are available for faculty and staff through the Center for Research in Disease Prevention, and the Health Improvement Program (HIP). Students may contact the Health Promotion Program (HPP) through the Student Health Center for smoking cessation information or programs.

Faculty, staff, and students repeatedly violating this policy may be subject to appropriate action to correct any violation(s) and prevent future occurrences.

Implementation and Distribution—Copies of this policy will be disseminated by the Manager of HR Policy/Staff and Labor Relations and the Vice Provost for Student Affairs to all faculty, staff, and students, and to all new members of the University community.

UNIVERSITY STATEMENT ON PRIVACY

Stanford University has an interest in ensuring that the privacy of its students, faculty, and staff is respected, and that no activities interfere with education, research, or residential life.

The University is private property; however, some areas of the campus are typically open to visitors. These areas include White Plaza, public eating areas (such as those at Tresidder Union), outdoor touring areas, and locations to which the public has been invited by advertised notice (such as for public educational, cultural, or athletic events). Even in these locations, visitors must not interfere with the privacy of students, faculty, and staff, or with educational, research, and residential activities. The University may revoke at any time permission to be present in these, or any other areas. Visitors should not be in academic or residential areas unless they have been invited for appropriate business or social purposes by the responsible faculty member, student, or staff member.

No commercial activity, including taking photos or similar audio or visual recordings that are sold to others or otherwise used for commercial purposes, may occur on the campus without the University’s permission. Requests for permission should be submitted to the Director of University Communications or, as appropriate, the Dean of Students, the Department of Athletics, or the Office of Public Events. Recognized student groups and official units of the University will be granted such permission so long as they do not violate privacy or property interests of others; so long as any sale of their products is predominantly on campus to students, faculty, and staff; and so long as they comply with applicable University policies and procedures.

Violators of this policy may be subject to criminal and/or civil liability, as well as University disciplinary action.

COMPUTER AND NETWORK USAGE POLICY

For a complete text of the currently applicable version of this policy, see Administrative Guide Memo 62, Computer and Network Usage Policy, at http://www-portfolio.stanford.edu/200141.

CHAT ROOMS AND OTHER FORUMS USING STANFORD DOMAINS OR COMPUTER SERVICES

For a complete text of the currently applicable version of this policy, see Administrative Guide Memo 66, Chat Rooms and Other Forums Using Stanford Domains or Computer Services, at http://www-portfolio.stanford.edu/106294.

This Guide Memo was approved by the President and establishes policy for the use of electronic forums at Stanford.

Definition—From time to time, University departments, faculty, students and others may host electronic communication forums, such as chat rooms, newsgroups, bulletin boards, or websites, whereby various parties may contribute their thoughts on various subjects and where such communication is made available for others to read and comment upon. For purposes of this policy, these sites are collectively referred to as forums.

Establishment of Forums—Forums that either use the Stanford.edu, Stanford.org, or other Stanford domains, or use University computing facilities, should be established only in connection with legitimate activities of the University.

Unless specifically sponsored by an academic administrative unit of the University, the University’s role in connection with these forums will be solely as a passive Internet service provider.

In all cases, as a condition to establishing a forum, forum homepages (where they exist) and each individual forum page should contain a header that states: Subject to Terms of Use and all pages should include a link to the page maintained by the University entitled “Terms of Use.” The URL is http://www.stanford.edu/home/atoz/terms.html.

Operation of Forums—All forums shall be operated in compliance with the Terms of Use, as modified from time to time, and the University’s various policies regarding computer facilities and services.
**UNIVERSITY PUBLICATIONS**

Many of the publications listed below, including this bulletin, may be viewed on the World Wide Web at www.stanford.edu. 

**Admissions information and applications** can be obtained from the Office of Undergraduate Admissions, and Graduate Admissions in the Registrar's Office (Old Union).

**Financial aid information** for undergraduate and graduate students is available from the Financial Aid Office (Old Union).

**Library guides, facts, maps, and borrowing regulations** are available at service desks of all Stanford libraries (address request to Green Library).

**Maps and visitors' guides** can be obtained at the Visitors' Information Office in Memorial Court, at the Stanford Bookstore, or by writing to the Guide and Visitors Service at the Office of Public Affairs (Building 170).

**Minority students, undergraduate and graduate**, and their opportunities and experiences at Stanford are addressed in special publications directed to Alaska Natives, American Indians, Blacks, Chicano, Mexican/Americans, and Puerto Ricans. The Office of Undergraduate Admissions and the recruitment officers of each of the respective schools will respond to requests for the appropriate publication.

**Stanford University Bulletins:** The Stanford Bulletin may be purchased from or at the Stanford Bookstore. To receive the bulletin via Parcel Post (U.S. only), send $9.00 for the bulletin, plus $5.00 for shipping (check or money order payable to Stanford Bookstore) to: Bookstore, White Plaza, Stanford, California 94305-3079. The price is subject to change. California residents add $1.75 state sales tax. Canada residents send $9.00 for the bulletin, plus $3.60 for surface shipping, or $6.50 for airmail. Mexico residents send $9.00 for the bulletin, plus $7.35 for surface shipping or $10.90 for airmail.

**Summer 'Session Catalogue or Summer Session for High School Student Catalogue** may be obtained free from the Summer Session Office. Individual schools and departments may be contacted directly for more specific information.

**Students from other countries** contact Graduate Admissions, the Registrar's Office, for Information for International Applicants; Bechtel International Center also provides helpful information to the international community.

**The Time Schedule** (course listings and registration information) is published quarterly and may be obtained at the Information Window in the Office of the Registrar (Old Union) and in Foresythe Hall information desk.

**Other publications of interest:**

**Access Stanford**, a guide for the physically limited, available at the Office of the Dean of Student Affairs (Old Union) and the Disability Resource Center (Meyer Library).

**Administrative Guide**, guide to administrative organization, policies, and procedures, available at the Controller's Office (857 Serra) and on the web.

**ASSU: Constitution and By-Laws**, inquire at Associated Students of Stanford University (Tresidder Union).

**ASSU Course Guide**, summaries of student evaluations of approximately 200 undergraduate courses, available at the ASSU Office (Tresidder Union).

**Charter of the Senate of the Academic Council of Stanford University**, available at the Academic Secretary's Office.

**Committee and Senate Handbook**, available at Academic Secretary's Office.

**Conference Planning at Stanford**, available at the Conference Office (Encina Commons).


**Graduate Student Handbook**, an introduction to offices and people who serve graduate students, available at the Office of the Dean of Graduate Research and Policy.

**Handbook for Academic Council Faculty, Medical Center Line Faculty, Academic Staff, Teaching, and Other Teaching Staff**, available from the Provost's Office, Faculty Affairs section (Bldg. 170).

**Human Resources and Development Course Catalogue**, published twice- year by Stanford's Human Resources Services Office.

**Information for Prospective Applicants**, an introduction to graduate study and graduate programs at Stanford, available at Graduate Admissions, the Registrar's Office, Old Union.

**Life Off the Farm**, a guide to off-campus goods, services, and activities, available at the Office of Residential Education (Old Union) and the Stanford Bookstore.

**The Lively Arts at Stanford**, season brochure of concerts and other performances, available at University Events (Press Bldg.).

**Rosters of the Senate, Advisory Board, and Various Committees**, available at the Academic Secretary's Office.

**Stanford Daily**, the student newspaper, available at many pickup sites on campus and by request to the Daily office (Storke Bldg.).

**Stanford Directory**, on sale at Stanford Bookstore and Stores.

**Stanford from the Beginning**, a history, available at the Visitors' Information Office in Memorial Court (write Guide and Visitors Service, Bldg. 170), and the Stanford Bookstore.

**Stanford Map**, on sale at the Stanford Bookstore.

**Stanford Memorial Church**, a guide and history, available at the Visitors' Information Office in Memorial Court (write Guide and Visitors Service, Bldg. 170) and the Stanford Bookstore.

**Stanford Report**, the weekly faculty/staff newspaper (includes events calendar and employment opportunities), available from News Service.

**Stanford Today**, a detailed description of undergraduate opportunities, available from the Office of Undergraduate Admissions (Old Union).

**Teaching at Stanford: An Introductory Handbook for Faculty, Academic Staff, Teaching, and Teaching Assistants**, available at the Center for Teaching and Learning (Sweet Hall).

**Training Opportunities for the Stanford Community**, available at the Forsyth Hall information desk.

Books about Stanford that are out of print or hard to find are available to scholars from the University Archives, Green Library. The Stanford University Archives manuscript and archival collections now number more than six million items. These are of related interest.


Clark, G. T., *Leland Stanford*, 1931

Elliott, O. L., *Stanford University: The First Twenty-Five Years*, 1937


Appendix

COURSES CERTIFIED FOR 2000-01 AS FULFILLING THE UNDERGRADUATE GENERAL EDUCATION REQUIREMENTS

Information regarding the General Education Requirements may be found in the "Undergraduate Degrees" section of this bulletin.

The following courses have been certified as fulfilling the General Education Requirements in 2000-01. Certain sequences must be completed in their entirety for General Education Requirement fulfillment, and those sequences are noted below.

Courses offered overseas during 2000-01 which satisfy the General Education Requirements are listed at the end of this section.

GENERAL EDUCATION REQUIREMENTS, 2000-01

AREA 1

All freshmen entering in Autumn Quarter 1997 and thereafter must satisfy the Area 1 Requirement by completing three courses from among the following options:

INTRODUCTION TO THE HUMANITIES

(Offered Autumn)
Introduction to the Humanities 14; The Good Life
Introduction to the Humanities 19; The Self, the Sacred, and the Human Good
Introduction to the Humanities 40; Conversions, Past and Present
Introduction to the Humanities 41; The History of Nature/The Nature of History
Introduction to the Humanities 42; Origins: Contested Identities
Introduction to the Humanities 43; Self-Reflections: The Examined Life
Introduction to the Humanities 44; Things of Beauty
Introduction to the Humanities 45; Tradition and Revolution: Rewriting the Classics

(Offered Winter and Spring)
Introduction to the Humanities 2, 3; Great Works: The Hereafter, the Here-and-Now (2 must be taken in conjunction with 3)
Introduction to the Humanities 8A, 9A; Myth and Modernity (8A must be taken in conjunction with 9A)
Introduction to the Humanities 21A, 21B; The Literature of Transformation (21A must be taken in conjunction with 21B)
Introduction to the Humanities 23A, 23B; Reason, Passion, and Reality (23A must be taken in conjunction with 23B)
Introduction to the Humanities 24A, 24B; Ten Days that Shook the World (24A must be taken in conjunction with 24B)
Introduction to the Humanities 26A, 26B; Democratic Society in Europe and America (26A must be taken in conjunction with 26B)
Introduction to the Humanities 27A, 27B; Encounters and Identities (27A must be taken in conjunction with 27B)
Introduction to the Humanities 28A, 28B; Poetic Justice: Order and Imagination in Russia (28A must be taken in conjunction with 28B)
Introduction to the Humanities 31A, 31B; Ancient Empires (31A must be taken in conjunction with 31B)
Introduction to the Humanities 32A, 32B; Serious Laughter (32A must be taken in conjunction with 32B)
Introduction to the Humanities 33A, 33B; Gender and Genre (33A must be taken in conjunction with 33B)
SLE91, 92, 93; Program in Structured Liberal Education (entire sequence must be completed and thereby also satisfies Area 3a)

AREA 2: NATURAL SCIENCES, APPLIED SCIENCE AND TECHNOLOGY, AND MATHEMATICS

Science, Mathematics, and Engineering 3A, 3B, 3C; Light in the Physical and Biological Worlds (if entire sequence is completed, satisfies Area 2)
Science, Mathematics, and Engineering 4; Oceans and Atmospheres (completion of 4, 5, 6 fulfills Area 2; may be taken separately for Area 2 subareas)
Science, Mathematics, and Engineering 5; Food and Water for a Changing Earth (completion of 4, 5, 6 fulfills Area 2; may be taken separately for Area 2 subarea)
Science, Mathematics, and Engineering 6; Evolution, Ecology, and the Human Condition (completion of 4, 5, 6 fulfills Area 2; may be taken separately for Area 2 subarea)
Science, Mathematics, and Engineering 8A,B; Information: Bits to Chips, Genes to Organisms (if both quarters are completed, fulfills Area 2a and 2b)

AREA 2A: NATURAL SCIENCES

Area 3 under the 1991 DR System
Anthropological Sciences 6; Human Origins
Anthropological Sciences 8; Introduction to Anthropological Genetics
Anthropological Sciences 133A (same as Human Biology 180); Beginning Osteology
Biology 11N; SIS: Biotechnology in Everyday Life
Biology 12N; SIS: The Origin of Species
Biology 13N; SIS: Environmental Problems and Solutions
Biology 14N; SIS: Plants and Civilization
Biology 15N; SIS: Environmental Literacy
Biology 16N; SIS: Island Ecology
Biology 18N; SIS: Plant Genetic Engineering
Biology 26N; SIS: Maintenance of the Genome
Biology 29N; SIS: The Outer Limits of Life
Chemistry 22N; SIS: Frontiers of Science
Chemistry 23N; SIS: Chemistry and Biology
Chemistry 24N; SIS: Nutrition and History
Chemistry 27Q; SIS: Lasers and the Light Fantastic
Chemistry 28N; SIS: Transforming Chemistry
Chemistry 31; Chemical Principles
Chemistry 32; The Frontiers of Chemical Science
Chemistry 33; Structure and Reactivity
Civil and Environmental Engineering 63; Weather and Storms
Civil and Environmental Engineering 64; Air Pollution: From Urban Smog to Global Change
Earth Systems 10; Introduction to Earth Systems
Geological and Environmental Sciences 1; Fundamentals of Geology
Geological and Environmental Sciences 2; Earth History
Geological and Environmental Sciences 8; The Oceans: An Introduction to the Marine Environment
Geological and Environmental Sciences 41N; SIS: El Nino—History and Predictability of a Global Climate
Geological and Environmental Sciences 42N; SIS: Early Life on Earth
Geological and Environmental Sciences 48N; SIS: Volcanoes of the Eastern Sierra
Geological and Environmental Sciences 50Q; SIS: The Coastal Zone Environment
Geological and Environmental Sciences 54Q; SIS: California Landforms and Plate Tectonics
Geophysics 4; Natural Hazards and Human Survival
Human Biology 2A; Genetics, Evolution, and Ecology
Human Biology 3A; Cell and Developmental Biology
Human Biology 4A; The Human Organism
Linguistics 110; Introduction to Phonetics and Phonology
Physics 15; The Nature of the Universe
Physics 18N; SIS: Revolutions in Concepts of the Cosmos
Physics 21; Mechanics and Heat
Physics 23; Electricity and Optics
Physics 25; Modern Physics
Physics 27; Evolution of the Cosmos
Physics 28; Mechanics, Heat, Electricity, and Magnetism
Physics 29; Electricity and Magnetism
Physics 41; Mechanics
Physics 43; Electricity
Physics 45; Magnetism
Physics 47; Light and Heat
Physics 50; Astronomy Laboratory and Observational Astronomy
Physics 61; Advanced Freshman Physics
Physics 63; Advanced Freshman Physics
Physics 65; Advanced Freshman Physics
Physics 70; Modern Physics
Physics 100; Introduction to Observational and Laboratory Astronomy
Psychology 20; Brain and Behavior

AREA 2B: APPLIED SCIENCE AND TECHNOLOGY

Area 6 under the 1991 DR System
Computer Science 99D; SIS: The Science of Art
Computer Science 105; Introduction to Computers
Computer Science 106A; Programming Methodology
Computer Science 106B; Programming Abstractions
Computer Science 108X; Programming Methodology and Abstractions
Engineering 1N; SIS: The Nature of Engineering
Engineering 10; Introduction to Engineering Analysis
Engineering 14; Applied Mechanics: Statics and Deformables
Engineering 15; Dynamics
Engineering 20; Introduction to Chemical Engineering
Engineering 25; Biotechnology
Engineering 30; Thermodynamics
Engineering 40; Introductory Electronics
Engineering 50; Introductory Science of Materials
Engineering 62; Introduction to Optimization
Geophysics 40; The Earth from Space
Linguistics 138; Introduction to Computational Linguistics
Petroleum Engineering 110Q; SIS: Soap Bubbles, Rain Drops, and Ink Jets

AREA 2C: MATHEMATICS

Area 4 under the 1991 DR System
Computer Science 103A; Discrete Mathematics for Computer Scientists
Computer Science 103X; Discrete Structures (Accelerated)
Economics 50; Economic Analysis I
Economics 101A; Introduction to Statistical Methods
Mathematics 19; Calculus
Mathematics 20; Calculus
Mathematics 21; Calculus
Mathematics 41; Single Variable Calculus
Mathematics 42; Single Variable Calculus
Mathematics 51; Linear Equations and Differential Calculus
Mathematics 51H; Honors Calculus
Mathematics 103; Matrix Theory and its Applications
Philosophy 57; Logic, Reasoning, and Argumentation
Philosophy 159; Basic Concepts in Mathematical Logic
Statistics 30; Statistical Thinking
Statistics 41N; SIS: News and Numbers—Interpreting Information
Statistics 44N; SIS: The Pleasures of Counting
Statistics 60 (same as Psychology 10); Introduction to Statistical Methods: Precalculus
Statistics 90; Introduction to Statistical Methods: Postcalculus
Statistics 110; Statistical Methods in Engineering and the Physical Sciences
Statistics 116; Theory of Probability

AREA 3: HUMANITIES AND SOCIAL SCIENCES

AREA 3A: HUMANITIES

Area 7 under the 1991 DR System is indicated by (7)
Area 8 under the 1991 DR system is indicated by (8)
American Studies 114Q; SIS: Visions of the 1960s (7) or (8)
American Studies 151; Transformation of American Thought and Culture (8)
American Studies 200 (same as History 260A); Perspectives on American Identity (8)
American Studies 214; The American 1960s: Thought, Protest, and Culture (8)

Art and Art History 1; Introduction to the Visual Arts (7)
Art and Art History 2; Ideas and Forms in Asian Art (7)
Art and Art History 4; Introduction to Film Study (7)
Art and Art History 101; Archaic Greek Art (7)
Art and Art History 102; Classical and Hellenistic Greek Art (7)
Art and Art History 104; Roman Art (7)
Art and Art History 110; Renaissance Painting (7)
Art and Art History 122; Painting in the Age of Revolution (7)
Art and Art History 124; The Age of Naturalism (7)
Art and Art History 130; Art in America and Britain, 1670-1825 (7)
Art and Art History 141; The Invention of Modern Architecture (7)
Art and Art History 142; Varieties of Modern Architecture (7)
Art and Art History 145; European Art 1890-1914 (7)
Art and Art History 160; Cinema and the City (7)
Art and Art History 186; Theme and Style in Japanese Art (7)
Art and Art History 187; Arts of War and Peace (7)
Asian Languages 71N; SIS: Language and Gender in Japan (7)
Asian Languages 73; Chinese Language, Culture, and Society (7)
Asian Languages 78; New Chinese Cinema (7)
Asian Languages 91; Traditional East Asian Civilization: China (7)
Asian Languages 92; Traditional East Asian Civilization: Japan (7)
Asian Languages 95; The Japanese Language in Culture and Society (7)
Asian Languages 131; Chinese Poetry in Translation (7)
Asian Languages 132; Chinese Fiction and Drama in Translation (7)
Asian Languages 133/233; Modern and Contemporary Chinese Literature in Translation (7)
Asian Languages 135; Classic Japanese Drama (7)
Asian Languages 138; Modern Japanese Literature in Translation (7)
Asian Languages 141; Chinese Mythology and Lyrical Imagination (7) or (8)
Asian Languages 187/287; Romance, Desire, and Sexuality in Modern Japanese Literature (7)
Classics 18; Greek Mythology (8)
Classics 19N; SIS: Horace and Kipling: Life in Rome (7)
Classics 23N; SIS: Cross-Cultural Perspective of Love (7)
Classics 102; Roman History: The Republic (7)
Classics 103; Roman History: The Empire (7)
Classics 105; History and Culture of Egypt (7)
Classics 119; Gender and Power in Ancient Rome (7)
Classics 130; Singers of Tales (7)
Classics 180; The Logic of History (7)
Comparative Literature 22N; SIS: Shakespeare and Performance (7)
Comparative Literature 24Q; SIS: Ethnicity and Literature (7)
Comparative Literature 34N (same as French and Italian 34N); SIS: Other Spaces, Other People (7)
Comparative Literature 168; Introduction to Asian-American Culture (7)
Comparative Literature 172; From Religion through Philosophy to Literature (7) or (8)
Comparative Literature 180: Nineteenth Century Novel (7)
Drama 12N; SIS: Antigone—From Ancient Democracy to Contemporary Dissent (7) or (8)
Drama 14N; SIS: Contemporary German Drama (7)
Drama 15N; SIS: The Shakespearean Era (7)
Drama 17N; SIS: Re-Viewing Valdez in Year 2000 (7)
Drama 19N; SIS: The Arts and Civic Dialogue (7)
Drama 65; American Musical Theater (7)
Drama 161; Performance and Politics (7)
Drama 162; Performance and the Actor (7)
Drama 163/263; Performance and America (7)
English 10/110; Masterpieces of English Literature I (7)
English 11/111; Masterpieces of English Literature II (7)
English 12/112; Masterpieces of American Literature (7)
English 30/130; The Novel (7)
English 40/140; Drama (7)
English 60K/160K; Gender and American Cinema 1930-50 (7)
English 63N; SIS: New Yorker Writers (7)
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<td>Cultural and Social Anthropology 153B; Millenialism in the American Imaginary: From Columbus to the Present [9]</td>
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<td>Economics 1; Elementary Economics [9]</td>
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<td>Economics 113; Technology and Economic Change [9]</td>
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<td>Economics 115; European Economic Theory [9]</td>
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<tr>
<td>Economics 116; American Economic History [9]</td>
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<tr>
<td>Engineering 113; Technology and Culture in 19th-Century America [9]</td>
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<tr>
<td>Engineering 130 (same as Science, Technology, and Society 101); Science, Technology, and Contemporary Society [9]</td>
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<td>History 18N; SIS: Confronting Islam [9]</td>
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<td>History 33A; The Rise of Scientific Medicine [9]</td>
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<tr>
<td>History 52N; SIS: The Atomic Bomb in Policy and History [9]</td>
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<tr>
<td>History 65; Introduction to Comparative Studies in Race and Ethnicity [9]</td>
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<td>History 75; The U.S. and East Asia [9]</td>
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<tr>
<td>History 80 (same as Latin American Studies 80); Culture, Politics, and Society in Latin America [9]</td>
<td></td>
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<td>History 85Q; SIS: Jews and Muslims [9]</td>
<td></td>
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<td>History 90Q; SIS: Buddhist Political and Social Theory [9]</td>
<td></td>
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<tr>
<td>History 92B; East Asia in the Age of Imperialism [9]</td>
<td></td>
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<tr>
<td>History 102A; The International System [9]</td>
<td></td>
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<tr>
<td>History 115; Technology and Culture in 19th-Century America [9]</td>
<td></td>
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<tr>
<td>History 119; Aristocracies and Absolutism [9]</td>
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<tr>
<td>History 150B; The Modern African-American Freedom Struggle [9]</td>
<td></td>
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<td>History 159; Introduction to Asian-American History [9]</td>
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<tr>
<td>History 165A; Colonial and Revolutionary America [9]</td>
<td></td>
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<tr>
<td>History 165B; Nineteenth-Century America [9]</td>
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<tr>
<td>History 165C; The U.S. in the 20th Century [9]</td>
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<td>History 172A; The U.S. since 1945 [9]</td>
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<td>History 173C (same as Feminist Studies 101); Introduction to Feminist Studies [9]</td>
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<tr>
<td>History 180; 20th-Century Brazil [9]</td>
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<tr>
<td>History 186A (same as Cultural and Social Anthropology 75); Modern South Asia: History, Society, Cultures [9]</td>
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<td>History 187B; The Middle East in the 20th Century [9]</td>
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<td>History 192C; Modern China [9]</td>
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<tr>
<td>History 194A; Japan from Earliest Times to 1560 [9]</td>
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<tr>
<td>History 194D; Rise of Modern Japan [9]</td>
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<tr>
<td>Human Biology 2B; Culture, Evolution, and Society [9]</td>
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<td>Human Biology 3B; Biology and Culture in Human Development [9]</td>
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<td>Human Biology 4B; The Human Predicament [9]</td>
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<td>Linguistics 30N; SIS: Language and Law [9]</td>
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<td>Linguistics 34Q; SIS: Language of Advertising [9]</td>
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<td>Linguistics 44N; SIS: Living with Two Languages [9]</td>
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<td>Linguistics 73; African-American Vernacular English [9]</td>
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<td>Linguistics 120; Introduction to Syntax [9]</td>
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<td>Linguistics 130B; Introduction to Lexical Semantics [9]</td>
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<td>Linguistics 140; Language Acquisition [9]</td>
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<td>Linguistics 150; Language in Society [9]</td>
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<td>Linguistics 160; Introduction to Language Change [9]</td>
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<td>Linguistics 189; Linguistics and the Teaching of English as a Second Language [9]</td>
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<td>Philosophy 20; Introduction to Moral Theory [8]</td>
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<td>Political Science 10; American National Government [9]</td>
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<td>Political Science 21N; SIS: The Politics of Labor in Advanced Industrial Democracies [9]</td>
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<td>Political Science 29; Contemporary East Asia [9]</td>
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<td>Political Science 35/135; International Politics [9]</td>
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<td>Political Science 60; American Dream [9]</td>
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<td>Political Science 91Q; SIS: Politics of Bureaucracy [9]</td>
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<td>Political Science 111D; British Politics [9]</td>
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<td>Political Science 115B; Chinese Politics: The Transformation and the Era of Reform [9]</td>
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<td>Political Science 117K; The Global Politics of Human Rights [9]</td>
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<td>Political Science 118B; The Politics of Race and Class in Southern Africa [9]</td>
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<td>Political Science 125; Rise of Industrial Asia [9]</td>
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<td>Political Science 133 (same as Psychology 165); Peace Studies [9]</td>
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<td>Political Science 134A; Strategy, War, and Politics [9]</td>
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<td>Political Science 134B; America and the World Economy [9]</td>
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<td>Political Science 138 (same as Management Science and Engineering 195); International Security in a Changing World [9]</td>
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<td>Political Science 182F (same as American Studies 179, Law 106); Introduction to American Law [9]</td>
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<td>Political Science 184W; Issues of Representation in American Politics [9]</td>
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<td>Political Science 185; Asian-Americans in Politics [9]</td>
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<td>Political Science 186; Urban Politics [9]</td>
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<td>Psychology 131; Language and Thought [9]</td>
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<td>Psychology 141; Cognitive Development [9]</td>
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<td>Psychology 165; Peace Studies [9]</td>
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<td>Sociology 121; Social Psychology and Social Structure [9]</td>
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<td>Sociology 130 (same as Education 220C); Education and Society [9]</td>
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<td>Sociology 140; Introduction to Social Stratification [9]</td>
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<td>Sociology 145; Race and Ethnic Relations [9]</td>
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<td>Sociology 149; The Urban Underclass [9]</td>
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<td>Sociology 160; Formal Organizations [9]</td>
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</tbody>
</table>

691
AREA 2 under the 1991 DR System

Anthropological Sciences 3; Introduction to Prehistoric Archaeology
Anthropological Sciences 125A; Twentieth-Century Chinese Societies
Anthropological Sciences 125B; Late Imperial China
Anthropological Sciences 142; The Incas and their Ancestors
Art and Art History 2; Ideas and Forms in Asian Art
Asian Languages 73; Chinese Language, Culture, and Society
Asian Languages 91; Traditional East Asian Civilization: China
Asian Languages 92; Introduction to East Asian Civilization: Japan
Asian Languages 115; History of Japanese Popular Culture
Asian Languages 131; Chinese Poetry in Translation
Asian Languages 132; Chinese Fiction and Drama in Translation
Asian Languages 133; Modern and Contemporary Chinese Literature in Translation
Asian Languages 135; Classic Japanese Drama
Asian Languages 138; Modern Japanese Literature in Translation
Classics 105; History and Culture of Egypt
Classics 130; Singers of Tales: Ancient and Contemporary Epic in Action
Comparative Literature 81N; SIS: Writing and Writing Systems
Comparative Literature 103; Egyptian East/Egyptian West
Cultural and Social Anthropology 1; Social and Cultural Anthropology
Cultural and Social Anthropology 15; Africa and the Diaspora
Cultural and Social Anthropology 77; Japanese Society and Culture
Cultural and Social Anthropology 82; Anthropology of Medicine
Cultural and Social Anthropology 87; Social Change in Contemporary China
Economics 118; The Economics of Development
Economics 121; Development Economics, with Special Reference to East Asia
Economics 124; Japanese Economy
French and Italian 133; Literature and Society: Introduction to Franco-phone Literature from Africa and the Caribbean
History 80 (same as Latin American Studies 80); Politics, Culture, and Society in Latin America
History 85Q; SIS: Jews and Muslims
History 87; Empires and Cultures in the Modern World
History 90Q; SIS: Buddhist Political and Social Theory
History 92A; The Historical Roots of Modern East Asia
History 96S; Searching for Self—Biographies and Autobiographies in China
History 147A; African History in Novels and Film
History 148; Introduction to African History
History 148C; Africa in the 20th Century
History 177; Modern Latin America
History 180; Twentieth-Century Brazil
History 185; Introduction to Islamic Civilization
History 186A (same as Cultural and Social Anthropology 75); Modern South Asia: History, Society, Cultures
History 187B; Middle East in the 20th Century
History 189A; Israel: 1880 to the Present
History 189B; The Ottoman Empire
History 192A; Chinese History to the 13th Century
History 192B; Chinese History from the Mongols to Early Modern Times
History 192C; Modern China
History 194D; The Rise of Modern Japan
History 296; Ordinary Lives: Social History of Early Modern China
Human Biology 118; Human Diversity
Literature, Culture, and Languages 125A; The Contemporary Arab World and Culture through Literature
Literature, Culture, and Languages 125E; The Arab World through Travel Literature
Literature, Culture, and Languages 125E; Arabic Short Stories and Poetry
Political Science 115B; Chinese Politics: The Transformation and the Era of Reform
Political Science 118A; Political Change in Tropical Africa
Psychology 140; Culture and Human Development
Psychology 161; Cultural Psychology
Religious Studies 6N; SIS: Readings in Asian Religions
Religious Studies 12; Religions of India
Religious Studies 14; Introduction to Buddhism
Religious Studies 18; Zen Buddhism
Religious Studies 120; Islam in China
Sociology 117A; China under Mao
Spanish and Portuguese 160E; Latin America before Independence
Spanish and Portuguese 161; Spanish American Literature II
Spanish and Portuguese 172E; Reading the Rain Forest
Spanish and Portuguese 253E; Modern Imagination and Mexico's Ancient Books
Spanish and Portuguese 298; Senior Seminar: Pan-American Movements

AREA 4 under the 1991 DR System

Area 2 under the 1991 DR System

Anthropological Sciences 3; Introduction to Prehistoric Archaeology
Anthropological Sciences 125A; Twentieth-Century Chinese Societies
Anthropological Sciences 125B; Late Imperial China
Anthropological Sciences 142; The Incas and their Ancestors
Art and Art History 2; Ideas and Forms in Asian Art
Asian Languages 73; Chinese Language, Culture, and Society
Asian Languages 91; Traditional East Asian Civilization: China
Asian Languages 92; Introduction to East Asian Civilization: Japan
Asian Languages 115; History of Japanese Popular Culture
Asian Languages 131; Chinese Poetry in Translation
Asian Languages 132; Chinese Fiction and Drama in Translation
Asian Languages 133; Modern and Contemporary Chinese Literature in Translation
Asian Languages 135; Classic Japanese Drama
Asian Languages 138; Modern Japanese Literature in Translation
Classics 105; History and Culture of Egypt
Classics 130; Singers of Tales: Ancient and Contemporary Epic in Action
Comparative Literature 81N; SIS: Writing and Writing Systems
Comparative Literature 103; Egyptian East/Egyptian West
Cultural and Social Anthropology 1; Social and Cultural Anthropology
Cultural and Social Anthropology 15; Africa and the Diaspora
Cultural and Social Anthropology 77; Japanese Society and Culture
Cultural and Social Anthropology 82; Anthropology of Medicine
Cultural and Social Anthropology 87; Social Change in Contemporary China
Economics 118; The Economics of Development
Economics 121; Development Economics, with Special Reference to East Asia
Economics 124; Japanese Economy
French and Italian 133; Literature and Society: Introduction to Franco-phone Literature from Africa and the Caribbean
History 80 (same as Latin American Studies 80); Politics, Culture, and Society in Latin America
History 85Q; SIS: Jews and Muslims
History 87; Empires and Cultures in the Modern World
History 90Q; SIS: Buddhist Political and Social Theory
History 92A; The Historical Roots of Modern East Asia
History 96S; Searching for Self—Biographies and Autobiographies in China
History 147A; African History in Novels and Film
History 148; Introduction to African History
History 148C; Africa in the 20th Century
History 177; Modern Latin America
History 180; Twentieth-Century Brazil
History 185; Introduction to Islamic Civilization
History 186A (same as Cultural and Social Anthropology 75); Modern South Asia: History, Society, Cultures
History 187B; Middle East in the 20th Century
History 189A; Israel: 1880 to the Present
History 189B; The Ottoman Empire
History 192A; Chinese History to the 13th Century
History 192B; Chinese History from the Mongols to Early Modern Times
History 192C; Modern China
History 194D; The Rise of Modern Japan
History 296; Ordinary Lives: Social History of Early Modern China
Human Biology 118; Human Diversity
Literature, Culture, and Languages 125A; The Contemporary Arab World and Culture through Literature
Literature, Culture, and Languages 125E; The Arab World through Travel Literature
Literature, Culture, and Languages 125E; Arabic Short Stories and Poetry
Political Science 115B; Chinese Politics: The Transformation and the Era of Reform
Political Science 118A; Political Change in Tropical Africa
Psychology 140; Culture and Human Development
Psychology 161; Cultural Psychology
Religious Studies 6N; SIS: Readings in Asian Religions
Religious Studies 12; Religions of India
Religious Studies 14; Introduction to Buddhism
Religious Studies 18; Zen Buddhism
Religious Studies 120; Islam in China
Sociology 117A; China under Mao
Spanish and Portuguese 160E; Latin America before Independence
Spanish and Portuguese 161; Spanish American Literature II
Spanish and Portuguese 172E; Reading the Rain Forest
Spanish and Portuguese 253E; Modern Imagination and Mexico's Ancient Books
Spanish and Portuguese 298; Senior Seminar: Pan-American Movements

AREA 5 under the 1991 DR System

Anthropological Sciences 120; Native American Cultures of North America
Comparative Literature 24Q; SIS: Ethnicity in Literature
Comparative Literature 168; Introduction to Asian-American Culture
Comparative Literature 202; Comparative Ethnic Biography
Cultural and Social Anthropology 150C; Introduction to Chicano Life and Culture
Drama 163; Performance and America
Economics 116; American Economic History
Education 156X; Racial and Ethnic Identity
English 68A/168A; Introduction to Native American Studies
English 126 (same as Comparative Literature 126); Twentieth Century American Fictions
History 50N; SIS: The Black Atlantic
History 50S; Race and Popular Culture
History 61; The Constitution and Race
History 64; Introduction to Race and Ethnicity in the American Experience
History 65 (same as Comparative Studies in Race and Ethnicity 65);
Introduction to Comparative Studies in Race and Ethnicity
History 147B; The Idea of Africa among African-Americans
History 150A; African-American History to the 20th Century
History 150B; Introduction to African-American History
History 159; Introduction to Asian-American History
History 162 (same as English 124C); Introduction to Chicano/a History and Culture
History 165B; Nineteenth-Century America
History 165C; The U.S. in the 20th Century
History 256; Topics in Mexican-American History
Linguistics 73; African-American Vernacular English
Music 16Q; SIS: Ki ho'alu—The New Renaissance of Hawaiian Musical Tradition
Music 111; Perspectives of North American Taiko
Philosophy 177; Philosophical Issues Concerning Race and Racism
Political Science 60; The American Dream
Religious Studies 8; Religion in America
Religious Studies 53; Jews and Judaism in America
Religious Studies 143; Chicano/Latino Religious Traditions
Religious Studies 163; Religion and Ethnicity/Race
Sociology 138/238; American Indians in Comparative-Historical Perspective
Sociology 139/239; American Indians in Contemporary Society
Sociology 145; Race and Ethnic Relations
Spanish and Portuguese 110N; SIS: Introduction to Chicana/o Literature and Visual Art
Spanish and Portuguese 112N; SIS: U.S.-Mexico Border in Film and Literature
Spanish and Portuguese 179E; Teatro America Workshop
Spanish and Portuguese 206; Spanish Use in Chicano Communities

AREA 4C: GENDER STUDIES

Gender Studies under the 1991 DR System
Anthropological Sciences 7; Marriage and Kinship
Anthropological Sciences 102; Women, Fertility, and Work
Asian Languages 71N; SIS: Language and Gender in Japan
Asian Languages 187/287; Romance, Desire, and Sexuality in Modern Japanese Literature
Biology 19N; SIS: Sex and Gender
Classics 23N; SIS: Cross-Cultural Perspectives on Love
Classics 117; Gender, Violence, and the Body in Ancient Religion
Classics 119; Gender and Power in Ancient Rome
Comparative Literature 22N; SIS: Shakespeare and Performance
Comparative Literature 84Q; SIS: Shakespeare, Playing, Gender
Cultural and Social Anthropology 132; Science, Technology, and Gender
Cultural and Social Anthropology 145; Comparative Feminism
Dance Division 160; Dance, Gender, and History
Dance Division 161; Dance and Live Art in the 20th Century
Drama 12N; SIS: Antigone—From Ancient Democracy to Contemporary Dissent
Economics 145; Economics of Labor
Education 197 (same as Sociology 134); Education and the Status of Women: Comparative Perspective
English 60K/160K; Gender and American Cinema 1930-50
English 65B/165B; Arthurian Literature
English 81Q; SIS: Women and Authority in the Early Middle Ages
English 137; Development of the Short Story
English 164, Orientations: Sex, Self, and Subterfuge
English 173B; Shakespeare
Feminist Studies 101 (same as History 173C); Introduction to Feminist Studies
French and Italian 108N; SIS: Female Saints
French and Italian 166E; Women's Voices in Contemporary Italian Fiction
French and Italian 192E; The Images of Women in French Cinema
German 134P; Medieval Women
History 36N; SIS: Gay Autobiography
History 105A (same as Medieval Studies 165); Medieval Culture
History 187C; Women in the Modern Middle East
History 205A; Private Lives, Public Stories—Autobiography of Women's History
History 211; Body, Gender, and Society in Medieval Europe
Human Biology 10; Human Sexuality
Human Biology 123; Sexuality in Adolescence
Human Biology 150; Gender Specific Perspectives on Birth Control
Linguistics 146; Language and Gender
Literature, Cultures, and Languages 125C; Contemporary Arab Women: Writers and Issues
Music 14N; SIS: Women Making Music
Philosophy 20; Introduction to Moral Theory
Philosophy 175; Feminist Practical Ethics
Political Science 167/267; Gender, Development, and Women's Human Rights in International Perspective
Political Science 266; Gender and Western Political Theory
Psychology 162; Psychology of Gender
Religious Studies 109; God and Gender: Christianity through the Eyes of Women
Religious Studies 110A; Updating Tradition
Religious Studies 112; Women and Islam
Religious Studies 172; Sex, Body, and Gender in Medieval Religion
Sociology 142; Sociology of Gender
Spanish and Portuguese 141; Contemporary Spanish Women Writers

Spanish and Portuguese 285E; Chicana Cultural Studies

OVERSEAS STUDIES

BERLIN

AREA 2: NATURAL SCIENCES, APPLIED SCIENCE AND TECHNOLOGY, AND MATHEMATICS

AREA 2B: APPLIED SCIENCE AND TECHNOLOGY
Area 5 under the 1991 DR System
Introductory Electronics
Introductory Science of Materials

AREA 3: HUMANITIES AND SOCIAL SCIENCES

AREA 3A: HUMANITIES
Area 7 under the 1991 DR System
Area 8 under the 1991 DR System is indicated by [8]
Architecture and the City 1871-1990 [7]
Contemporary Theater [7]
Industry, Technology, and Culture 1780-1945 [7]
The Industrial Revolution and its Impact on Art, Architecture, and Theory [7]
Literary Institutions: A Comparative Approach [7]
War and Peace in the 20th Century [7]
The Second World War in Berlin [7]
Opera [7]
Thomas Mann's Novel: Doktor Faustus [7]
The German Reformation and Its Consequences [8]
Sissi Sits, Lola Runs [7]
Religion in the Age of Goethe [8]

AREA 3B: SOCIAL SCIENCES

Area 9 under the 1991 DR System
Culture and Politics in Modern Germany
German Economy: Past and Present
Multiculturalism in Germany
German Economy in the Age of Globalization
The European Union, Superpower in the Making?
A People's Union? Money, Markets, and Identity in the EU
Sport-Free! Sports and Modernity in Comparative Perspective

AREA 4: WORLD CULTURES, AMERICAN CULTURES, AND GENDER STUDIES

AREA 4C: GENDER STUDIES
Gender Studies under the 1991 DR System
Gender and Cultural Discourse in Modern German Literature
Sissi Sits, Lola Runs

FLORENCE

AREA 2: NATURAL SCIENCES, APPLIED SCIENCE AND TECHNOLOGY, AND MATHEMATICS

AREA 2B: APPLIED SCIENCE AND TECHNOLOGY
Area 6 under the 1991 DR System
Introductory Science of Materials

AREA 3: HUMANITIES AND SOCIAL SCIENCES

AREA 3A: HUMANITIES
Area 7 under the 1991 DR System is indicated by [7]
Area 8 under the 1991 DR System is indicated by [8]
Modernist Italian Cinema [7]
From Giotto to Michelangelo: Introduction to the Renaissance in Florence [7]
Realism, Utopia, Myth, and Society in Italian Cinema [7]
The Duomo and Palazzo della Signoria: Symbols of a Civilization [7]
The Making of Literary Identity [7]
The Scientific Revolution: From the Renaissance to the 18th Century [8]
Gender and Power in Ancient Rome [7]
The City of Rome
Living in the Past
Power, Art, and Knowledge in Renaissance Italy
Science, Technology, and Art
Literary Institutions: A Comparative Approach

AREA 3B: SOCIAL SCIENCES
Area 9 under the 1991 DR System
European Union and Southern Europe
The Integration of Europe
Italy: From an Agrarian to a Post-Industrial Society
Italy: Crisis, Change, Choice

AREA 4: WORLD CULTURES, AMERICAN CULTURES, AND GENDER STUDIES
AREA 4C: GENDER STUDIES
Gender Studies under the 1991 DR System
Gender and Power in Ancient Rome

KYOTO
AREA 2: NATURAL SCIENCES, APPLIED SCIENCE AND TECHNOLOGY, AND MATHEMATICS
AREA 2B: APPLIED SCIENCE AND TECHNOLOGY
Area 6 under the 1991 DR System
Energy and Climate Change
Introductory Electronics
Introductory Science of Materials

AREA 3: HUMANITIES AND SOCIAL SCIENCES
AREA 3A: HUMANITIES
Area 8 under the 1991 DR System is indicated by [8]
Religion and Japanese Culture
AREA 3B: SOCIAL SCIENCES
Area 9 under the 1991 DR System
The Political Economy of Japan

AREA 4: WORLD CULTURES, AMERICAN CULTURES, AND GENDER STUDIES
AREA 4A: WORLD CULTURES
Religion and Japanese Culture

MOSCOW
AREA 3: HUMANITIES AND SOCIAL SCIENCES
AREA 3A: HUMANITIES
Area 7 under the 1991 DR System
Russia in the Age of Nobility 1700-1840
Stalinism, High Stalinism, and the Cold War in Moscow
Literary Institutions: A Comparative Approach

AREA 3B: SOCIAL SCIENCES
Area 9 under the 1991 DR System
Russian Politics
Economic Reform and Economic Policy in Modern Russia
Contemporary Issues of Russian Society
War and Women in Russia in the 20th Century

AREA 4: WORLD CULTURES, AMERICAN CULTURES, AND GENDER STUDIES
AREA 4C: GENDER STUDIES
Gender Studies under the 1991 DR System
War and Women in Russia in the 20th Century

OXFORD
AREA 3: HUMANITIES AND SOCIAL SCIENCES
AREA 3A: HUMANITIES
Area 7 under the 1991 DR System
Literary Institutions: A Comparative Approach

Europe: Integration and Disintegration of States, Politics, and Civil Societies
Rousseau and His Times

AREA 4: WORLD CULTURES, AMERICAN CULTURES, AND GENDER STUDIES
AREA 4C: GENDER STUDIES
Gender Studies under the 1991 DR System
Gender, Development, and Women's Human Rights in International Perspective

PUEBLA
AREA 3: HUMANITIES AND SOCIAL SCIENCES
AREA 3A: HUMANITIES
Area 7 under the 1991 DR System
Popular Mexican Art
Literary Institutions: A Comparative Approach
AREA 3B: SOCIAL SCIENCES
Area 9 under the 1991 DR System
Cholula: The Workings of a Sacred City
Mexico: Explaining Change in an Era of Globalization
Development Macroeconomics: The Mexican Case
Competitiveness and Corporate Governance of Latin American Firms

SANTIAGO
AREA 2: NATURAL SCIENCES, APPLIED SCIENCE AND TECHNOLOGY, AND MATHEMATICS
AREA 2B: APPLIED SCIENCE AND TECHNOLOGY
Area 6 under the 1991 DR System
Man-Environment Interactions

AREA 3: HUMANITIES AND SOCIAL SCIENCES
AREA 3A: HUMANITIES
Area 7 under the 1991 DR System
Modernization and Culture in Latin America
Politics and Culture in Chile
Literary Institutions: A Comparative Approach

AREA 3B: SOCIAL SCIENCES
Area 9 under the 1991 DR System
Cultural Modernization: The Case of Chile
Latin American Economies in Transition
Latin America in the International System
Latin America in the International Economy
Social Heterogeneity in Latin America
Political Transition and Democratic Consolidation
Urban Politics in Latin America
Urban Cultures in Santiago
Modernization and its Discontents
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative Writing, 355, 359</td>
</tr>
<tr>
<td>Credentials, Public School, 37</td>
</tr>
<tr>
<td>Credit, 23</td>
</tr>
<tr>
<td>Activity Courses, 23</td>
</tr>
<tr>
<td>Advanced Placement, 22</td>
</tr>
<tr>
<td>Internship Guidelines, 23</td>
</tr>
<tr>
<td>Satisfactory/No Credit, 23</td>
</tr>
<tr>
<td>Transfer, 23</td>
</tr>
<tr>
<td>Cross-Enrollment Agreements for ROTC, 675</td>
</tr>
<tr>
<td>Cultural and Social Anthropology, 317</td>
</tr>
<tr>
<td>Cuthbertson Award, Kenneth M., 674</td>
</tr>
<tr>
<td>Dance Division, 329, 334</td>
</tr>
<tr>
<td>Database, Computer Science, 136</td>
</tr>
<tr>
<td>Deans' Award for Academic Achievement, 674</td>
</tr>
<tr>
<td>Dean of Students, 670</td>
</tr>
<tr>
<td>Deferment Loan Program, 17</td>
</tr>
<tr>
<td>Delinquent Accounts, 17</td>
</tr>
<tr>
<td>Departmental Honors Programs, see Department Listings</td>
</tr>
<tr>
<td>Design, Architecture and Urban Design Option (Urban Studies), 618</td>
</tr>
<tr>
<td>Art, 239</td>
</tr>
<tr>
<td>Product (Engineering), 98, 191</td>
</tr>
<tr>
<td>Developmental Biology, 641</td>
</tr>
<tr>
<td>Dinkelspiel Awards, 674</td>
</tr>
<tr>
<td>Directing (Drama), 326</td>
</tr>
<tr>
<td>Directory, 8</td>
</tr>
<tr>
<td>Board of Trustees, The, 8</td>
</tr>
<tr>
<td>Administrative Organization, 8</td>
</tr>
<tr>
<td>Directory Information, 40</td>
</tr>
<tr>
<td>Disability Act, Americans with, 677</td>
</tr>
<tr>
<td>Disability Resource Center (DRC), 670</td>
</tr>
<tr>
<td>Dissertation Fee, 16</td>
</tr>
<tr>
<td>Doctor of Education, 35, 80</td>
</tr>
<tr>
<td>Doctor of Jurisprudence, 35</td>
</tr>
<tr>
<td>Doctor of Medicine, 35, 613</td>
</tr>
<tr>
<td>Doctor of Musical Arts, 35</td>
</tr>
<tr>
<td>in Composition, 473</td>
</tr>
<tr>
<td>Doctor of Philosophy, 35</td>
</tr>
<tr>
<td>Candidacy Time Limit, 35</td>
</tr>
<tr>
<td>Dissertation, 36</td>
</tr>
<tr>
<td>Doctoral Dissertation Reading Committee, 36</td>
</tr>
<tr>
<td>Foreign Language Requirement, 36</td>
</tr>
<tr>
<td>Ph.D. Minor, 36</td>
</tr>
<tr>
<td>Teaching Requirements, 36</td>
</tr>
<tr>
<td>Time Limit, 35</td>
</tr>
<tr>
<td>University Oral Examination, 36</td>
</tr>
<tr>
<td>Doctor of the Science of Law, 35</td>
</tr>
<tr>
<td>Document Fee, 16</td>
</tr>
<tr>
<td>Documentary Film and Video, 294</td>
</tr>
<tr>
<td>Domestic Partners Policy, 678</td>
</tr>
<tr>
<td>Dormitories, see Residences</td>
</tr>
<tr>
<td>Drama, 326</td>
</tr>
<tr>
<td>Drama and Humanities, Joint Ph.D. Program in, 328</td>
</tr>
<tr>
<td>Drawing, 238</td>
</tr>
<tr>
<td>Dual Bachelor's Degree and B.A.S. Programs, 20</td>
</tr>
<tr>
<td>Earth Sciences, School of, 48</td>
</tr>
<tr>
<td>Earth Systems Program, 48</td>
</tr>
<tr>
<td>East Asian Studies, 336</td>
</tr>
<tr>
<td>and Business, 338</td>
</tr>
<tr>
<td>and Education, 338</td>
</tr>
<tr>
<td>and Health Services Research, 338</td>
</tr>
<tr>
<td>and Law, 338</td>
</tr>
<tr>
<td>East Asian Studies Theme House, 252, 337</td>
</tr>
<tr>
<td>Ecology/Evolution Ph.D. Track, 270</td>
</tr>
<tr>
<td>Econometrics, 353</td>
</tr>
<tr>
<td>Economic Development, 351</td>
</tr>
<tr>
<td>Economic History, 351</td>
</tr>
<tr>
<td>Economics, 344</td>
</tr>
<tr>
<td>Economics and Law, Joint Ph.D. Program in, 347</td>
</tr>
<tr>
<td>Economics of Industry, 352</td>
</tr>
<tr>
<td>Economics of Labor, 352</td>
</tr>
<tr>
<td>Ed.D. Degree, 35, 80</td>
</tr>
<tr>
<td>Education, School of, 79</td>
</tr>
<tr>
<td>Educational Specialist (Ed.S.), 35</td>
</tr>
<tr>
<td>Electrical Engineering, 100, 102, 105, 150</td>
</tr>
<tr>
<td>End-Quarter Period Policy Statement, 40</td>
</tr>
<tr>
<td>Energy Science and Technology, 50</td>
</tr>
<tr>
<td>Engineer Degree, 34, 106</td>
</tr>
<tr>
<td>Engineering Geology and Hydrogeology, 55</td>
</tr>
<tr>
<td>Engineering, School of, 96</td>
</tr>
<tr>
<td>Engineering, (3/2) Degree Programs, 97</td>
</tr>
<tr>
<td>English, 354</td>
</tr>
<tr>
<td>and American Literature, 358</td>
</tr>
<tr>
<td>and Comparative Literature, 358</td>
</tr>
<tr>
<td>and French Literatures, 356</td>
</tr>
<tr>
<td>and German Literatures, 356</td>
</tr>
<tr>
<td>and Humanities, Joint Ph.D. in, 359</td>
</tr>
<tr>
<td>and Italian Literatures, 356</td>
</tr>
<tr>
<td>and Spanish or Spanish-American Literatures, 356</td>
</tr>
<tr>
<td>with a Creative Writing Emphasis, 355</td>
</tr>
<tr>
<td>with Interdisciplinary Emphasis, 355</td>
</tr>
<tr>
<td>English as a Second Language, 468</td>
</tr>
<tr>
<td>Environmental and Water Studies, CEE, 123</td>
</tr>
<tr>
<td>Environmental Sciences, 54</td>
</tr>
<tr>
<td>Environmental Science, Technology, and Policy, Honors Program in, 663</td>
</tr>
<tr>
<td>Epidemiology Program, 643</td>
</tr>
<tr>
<td>Ethics in Society, Program in, 367</td>
</tr>
<tr>
<td>Examinations, 40</td>
</tr>
<tr>
<td>End-Quarter Policy Statement, 40</td>
</tr>
<tr>
<td>Early Examinations, 41</td>
</tr>
<tr>
<td>Midterms, 40</td>
</tr>
<tr>
<td>Exchange Programs and Cross-Enrollment Agreements, 675</td>
</tr>
<tr>
<td>Exploration and Development, 68</td>
</tr>
<tr>
<td>Faculty and Staff Awards, 673</td>
</tr>
<tr>
<td>Family Educational Rights and Privacy Act (FERPA), 39</td>
</tr>
<tr>
<td>Fees, 16</td>
</tr>
<tr>
<td>Application, 16</td>
</tr>
<tr>
<td>ASSU, 16</td>
</tr>
<tr>
<td>Document, 16</td>
</tr>
<tr>
<td>Health Insurance, 16</td>
</tr>
<tr>
<td>Late Payment, 17</td>
</tr>
<tr>
<td>Payments, 17</td>
</tr>
<tr>
<td>Refunds, 17</td>
</tr>
<tr>
<td>Special, 16</td>
</tr>
<tr>
<td>Fellowships and Assistantships, 14</td>
</tr>
<tr>
<td>Outside, 14</td>
</tr>
<tr>
<td>Postdoctoral, 14</td>
</tr>
<tr>
<td>Feminist Studies, 369</td>
</tr>
<tr>
<td>Film, see Communication</td>
</tr>
<tr>
<td>Film Studies, 374</td>
</tr>
<tr>
<td>Financial Aid, see Graduate or Undergraduate Financial Aid</td>
</tr>
<tr>
<td>Financial Mathematics, 374</td>
</tr>
<tr>
<td>Flow Physics and Computation Division (FPC), 112</td>
</tr>
<tr>
<td>Florence, Stanford Program in, 498</td>
</tr>
<tr>
<td>Founding Grant, 6</td>
</tr>
<tr>
<td>Founding of the University, 6</td>
</tr>
<tr>
<td>Fraternities, see Residences, French and Italian, 375</td>
</tr>
<tr>
<td>French and Engineering Studies, 377</td>
</tr>
<tr>
<td>French and Linguistics, 377</td>
</tr>
<tr>
<td>French Section, 375, 385</td>
</tr>
<tr>
<td>Italian Section, 381, 389</td>
</tr>
<tr>
<td>Literatures, Ph.D. Minor in, 381, 385</td>
</tr>
<tr>
<td>Fundamental Standard, 654</td>
</tr>
<tr>
<td>General Education Requirements, 21</td>
</tr>
<tr>
<td>Credit Transfer, 22</td>
</tr>
<tr>
<td>Current System, 22</td>
</tr>
<tr>
<td>Purpose, 21</td>
</tr>
<tr>
<td>Undergraduates who entered prior to Autumn, 1996, 22</td>
</tr>
<tr>
<td>see also Appendix for course list, 687</td>
</tr>
<tr>
<td>Genetics, 620</td>
</tr>
<tr>
<td>Geochemistry, Petrology, and Mineralogy, 56</td>
</tr>
<tr>
<td>Geological and Environmental Sciences, 53</td>
</tr>
<tr>
<td>Geological Sciences, 53</td>
</tr>
<tr>
<td>Geomathematics, 56</td>
</tr>
<tr>
<td>Geophysical, 67</td>
</tr>
<tr>
<td>Geosphere, 50</td>
</tr>
<tr>
<td>Geostatistics in the Earth Sciences, 56</td>
</tr>
<tr>
<td>German Studies, 391</td>
</tr>
<tr>
<td>Interdisciplinary Programs, 393</td>
</tr>
<tr>
<td>Ginzton, Edward L., Laboratory, 662</td>
</tr>
<tr>
<td>Global Positioning System (GPS), 111</td>
</tr>
<tr>
<td>Gores Award, Walter J., 674</td>
</tr>
<tr>
<td>Government, see Student Affairs, 41</td>
</tr>
<tr>
<td>Grading Systems, 42</td>
</tr>
<tr>
<td>Definition and Explanation, 42</td>
</tr>
<tr>
<td>General, 42</td>
</tr>
<tr>
<td>Graduate School of Business, 43</td>
</tr>
<tr>
<td>Reporting of Grades, 42</td>
</tr>
<tr>
<td>Revision of End-Quarter Grades, 42</td>
</tr>
<tr>
<td>Satisfactory/No Credit Option, 42</td>
</tr>
<tr>
<td>School of Law, 43</td>
</tr>
<tr>
<td>School of Medicine, 43</td>
</tr>
<tr>
<td>Graduate Admissions, 11</td>
</tr>
<tr>
<td>Matriculated Study, 11</td>
</tr>
<tr>
<td>Nonmatriculated Study, 12</td>
</tr>
<tr>
<td>Postdoctoral Scholars, 12</td>
</tr>
<tr>
<td>Visiting Researchers, 12</td>
</tr>
<tr>
<td>Topic</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Associated Students</td>
</tr>
<tr>
<td>Board of Trustees</td>
</tr>
<tr>
<td>Executive Officers</td>
</tr>
<tr>
<td>Provost</td>
</tr>
<tr>
<td>University Committees</td>
</tr>
<tr>
<td>Orientation Fee, New Student</td>
</tr>
<tr>
<td>Overseas Studies</td>
</tr>
<tr>
<td>Ownership and Use of Stanford Name and Trademarks</td>
</tr>
<tr>
<td>Overseas Studies, Distribution Requirements</td>
</tr>
<tr>
<td>Overseas Studies, Program</td>
</tr>
<tr>
<td>Orientation Fee, New Student</td>
</tr>
<tr>
<td>Painting</td>
</tr>
<tr>
<td>Paris, Stanford Program in</td>
</tr>
<tr>
<td>Pathology</td>
</tr>
<tr>
<td>Paris, Stanford Program in</td>
</tr>
<tr>
<td>Painting</td>
</tr>
<tr>
<td>Physics, 516</td>
</tr>
<tr>
<td>PINs, 40</td>
</tr>
<tr>
<td>Playwriting/Dramaturgy (Drama), 326</td>
</tr>
<tr>
<td>Police Services</td>
</tr>
<tr>
<td>Political Activities</td>
</tr>
<tr>
<td>Political Organizations</td>
</tr>
<tr>
<td>Political Science, 526</td>
</tr>
<tr>
<td>Political Theory</td>
</tr>
<tr>
<td>Population and Environmental, 225</td>
</tr>
<tr>
<td>Population and Resource Studies, Morrison Institute for, 540</td>
</tr>
<tr>
<td>Portuguese, 601</td>
</tr>
<tr>
<td>Postdoctoral Scholars, 12</td>
</tr>
<tr>
<td>Predental, Premedical, Preparamedical Requirements, 268</td>
</tr>
<tr>
<td>President of the University</td>
</tr>
<tr>
<td>President’s Award</td>
</tr>
<tr>
<td>Privacy, 39, 685</td>
</tr>
<tr>
<td>Probation, 28</td>
</tr>
<tr>
<td>Product Design, 98, 239</td>
</tr>
<tr>
<td>Prospective Principal’s Program</td>
</tr>
<tr>
<td>Provisional Registration</td>
</tr>
<tr>
<td>Provost</td>
</tr>
<tr>
<td>Psychological Studies in Education (PSE), 79</td>
</tr>
<tr>
<td>Psychology</td>
</tr>
<tr>
<td>Cognitive Science Program, 546</td>
</tr>
<tr>
<td>Public Finance</td>
</tr>
<tr>
<td>Public Policy Program</td>
</tr>
<tr>
<td>Public School Credentials</td>
</tr>
<tr>
<td>Puebla, Stanford Program in</td>
</tr>
<tr>
<td>Radiation Oncology</td>
</tr>
<tr>
<td>Radiology, 659</td>
</tr>
<tr>
<td>Real-World Computing</td>
</tr>
<tr>
<td>Records, 39</td>
</tr>
<tr>
<td>Certification of Enrollment or Degrees</td>
</tr>
<tr>
<td>Notification of Rights under FERPA</td>
</tr>
<tr>
<td>Privacy, 39</td>
</tr>
<tr>
<td>Transcripts, 39</td>
</tr>
<tr>
<td>Recreation, 262</td>
</tr>
<tr>
<td>Refunds, 17</td>
</tr>
<tr>
<td>Room and Meal Plan</td>
</tr>
<tr>
<td>Tuition</td>
</tr>
<tr>
<td>Registration and Study Lists, 38</td>
</tr>
<tr>
<td>Amount of Work</td>
</tr>
<tr>
<td>Auditing, 39</td>
</tr>
<tr>
<td>Identification Cards, 40</td>
</tr>
<tr>
<td>Personal Identification Numbers, 40</td>
</tr>
<tr>
<td>Repeated Courses</td>
</tr>
<tr>
<td>Study List Changes</td>
</tr>
<tr>
<td>Transcripts, 39</td>
</tr>
<tr>
<td>Unit of Credit</td>
</tr>
<tr>
<td>Withdrawal Following Registration, 39</td>
</tr>
<tr>
<td>Rehabilitation Act of 1973</td>
</tr>
<tr>
<td>Reinstatement, Graduate Division</td>
</tr>
<tr>
<td>Religious Activities</td>
</tr>
<tr>
<td>Religious Studies</td>
</tr>
<tr>
<td>and Humanities, Joint Ph.D. Program in, 558</td>
</tr>
<tr>
<td>and Philosophy, Major in, 557</td>
</tr>
<tr>
<td>Repeated Courses</td>
</tr>
<tr>
<td>Reporting of Grades</td>
</tr>
<tr>
<td>Requirements, Graduate</td>
</tr>
<tr>
<td>Reinstatement, Undergraduate</td>
</tr>
<tr>
<td>General Education</td>
</tr>
<tr>
<td>Language, 22</td>
</tr>
<tr>
<td>Major</td>
</tr>
<tr>
<td>Writing, 21</td>
</tr>
<tr>
<td>Roads Also Appendix, 687</td>
</tr>
<tr>
<td>Residences</td>
</tr>
<tr>
<td>Community Housing</td>
</tr>
<tr>
<td>Deans</td>
</tr>
<tr>
<td>Graduate, 18</td>
</tr>
<tr>
<td>Undergraduate, 18</td>
</tr>
<tr>
<td>Residency, Graduate</td>
</tr>
<tr>
<td>Credit for Graduate Work Done Elsewhere, 31</td>
</tr>
<tr>
<td>Leaves of Absence, 30</td>
</tr>
<tr>
<td>Minimum Units Requirements, 32</td>
</tr>
<tr>
<td>Reinstatement</td>
</tr>
<tr>
<td>Residency, 30</td>
</tr>
<tr>
<td>Residential Education Program, 18</td>
</tr>
<tr>
<td>Room Rates</td>
</tr>
<tr>
<td>Refunds</td>
</tr>
<tr>
<td>ROTC, Air Force, Army, Naval</td>
</tr>
<tr>
<td>Russian and East European Studies</td>
</tr>
<tr>
<td>Russian Culture</td>
</tr>
<tr>
<td>Russian Language</td>
</tr>
<tr>
<td>Russian Language, Literature, and Culture</td>
</tr>
<tr>
<td>Santiago, Chile, Stanford Program in</td>
</tr>
<tr>
<td>Schools of the University</td>
</tr>
<tr>
<td>Science, Mathematics, Engineering Core</td>
</tr>
<tr>
<td>Science, Technology, and Society (STS)</td>
</tr>
<tr>
<td>Scientific Computing and Computational Mathematics Program</td>
</tr>
<tr>
<td>Sculpture</td>
</tr>
<tr>
<td>Secondary Major</td>
</tr>
<tr>
<td>Second Bachelor's Degree</td>
</tr>
<tr>
<td>Sedimentary Geology, Paleoclimatology, Marine Geology, Paleontology</td>
</tr>
<tr>
<td>Sexual Assault, Policy on</td>
</tr>
<tr>
<td>Sexual Harassment, Policy on</td>
</tr>
<tr>
<td>Consensual Relationships</td>
</tr>
<tr>
<td>External Reporting</td>
</tr>
<tr>
<td>Procedural Matters</td>
</tr>
<tr>
<td>Resources for Dealing with</td>
</tr>
<tr>
<td>Slavic Languages and Literatures</td>
</tr>
<tr>
<td>and Humanities, Joint Ph.D. Program in</td>
</tr>
<tr>
<td>Slavic Theme House</td>
</tr>
<tr>
<td>Sloan Program, Stanford</td>
</tr>
<tr>
<td>Smoke-Free Environment</td>
</tr>
<tr>
<td>Social Psychology and Interpersonal Processes</td>
</tr>
<tr>
<td>Social Stratification and Inequality</td>
</tr>
<tr>
<td>Sociological Theory</td>
</tr>
<tr>
<td>Sociology</td>
</tr>
<tr>
<td>Joint Program with the Law School</td>
</tr>
<tr>
<td>Software Theory</td>
</tr>
<tr>
<td>Social Science History Institute</td>
</tr>
<tr>
<td>Solid State, Electrical Engineering</td>
</tr>
<tr>
<td>Space Physics and Radioscience</td>
</tr>
<tr>
<td>Space Science and Astrophysics (CSSA)</td>
</tr>
<tr>
<td>Spanish and Portuguese</td>
</tr>
<tr>
<td>Overseas Programs in Brazil, Chile, Spain, and Latin America</td>
</tr>
<tr>
<td>Special Fees</td>
</tr>
<tr>
<td>Special Language Program</td>
</tr>
<tr>
<td>Stanford Events</td>
</tr>
<tr>
<td>Lively Arts</td>
</tr>
<tr>
<td>Ticket Office</td>
</tr>
<tr>
<td>Stanford Institute for Economic Policy Research</td>
</tr>
<tr>
<td>Stanford Instructional Television Network (SITN)</td>
</tr>
<tr>
<td>Stanford Introduction Seminars</td>
</tr>
<tr>
<td>Stanford Linear Accelerator Center (SLAC)</td>
</tr>
<tr>
<td>Stanford Synchrotron Radiation Laboratory (SSRL)</td>
</tr>
<tr>
<td>Stanford Teacher Education Program (STEP)</td>
</tr>
<tr>
<td>Stanford in Washington</td>
</tr>
<tr>
<td>Statistics</td>
</tr>
<tr>
<td>Structural Biology</td>
</tr>
<tr>
<td>Structural Geology and Geomechanics</td>
</tr>
<tr>
<td>Structural Geology, Regional Geology, and Tectonics</td>
</tr>
<tr>
<td>Structured Liberal Education Program</td>
</tr>
<tr>
<td>Structures and Composites Laboratories</td>
</tr>
</tbody>
</table>