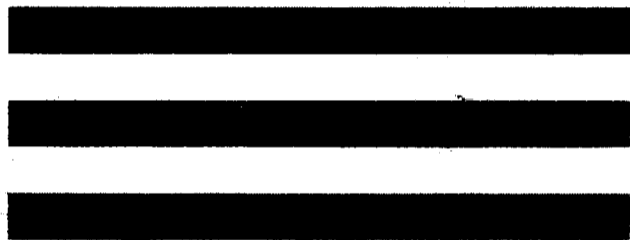


**UCSD**  
**University**  
**of California,**  
**San Diego**

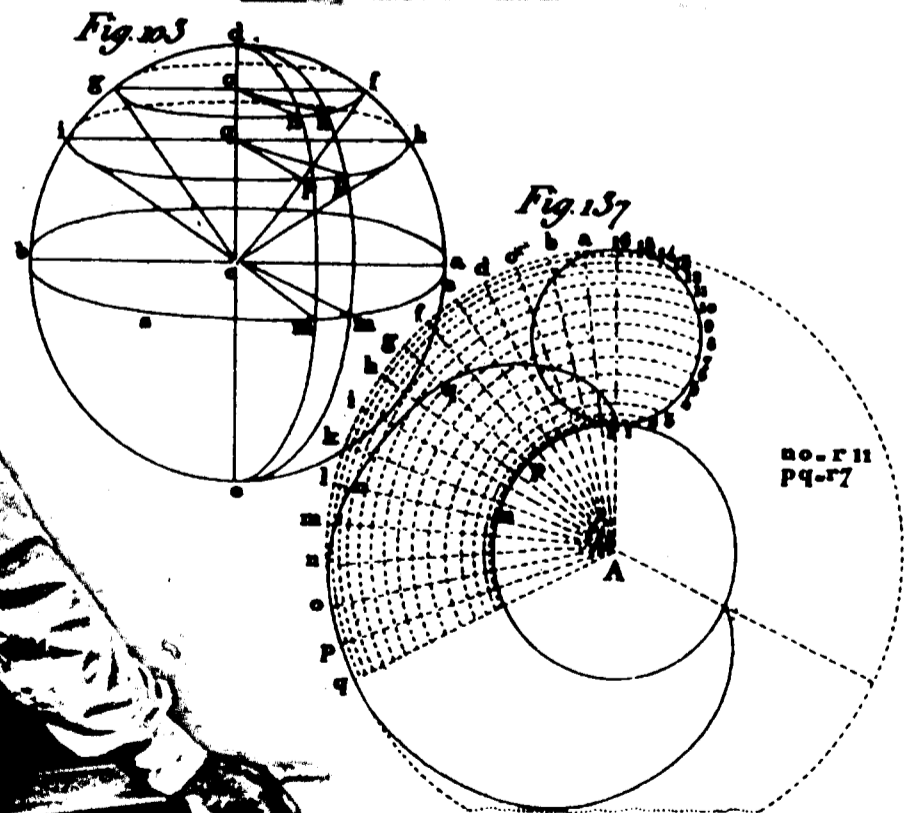
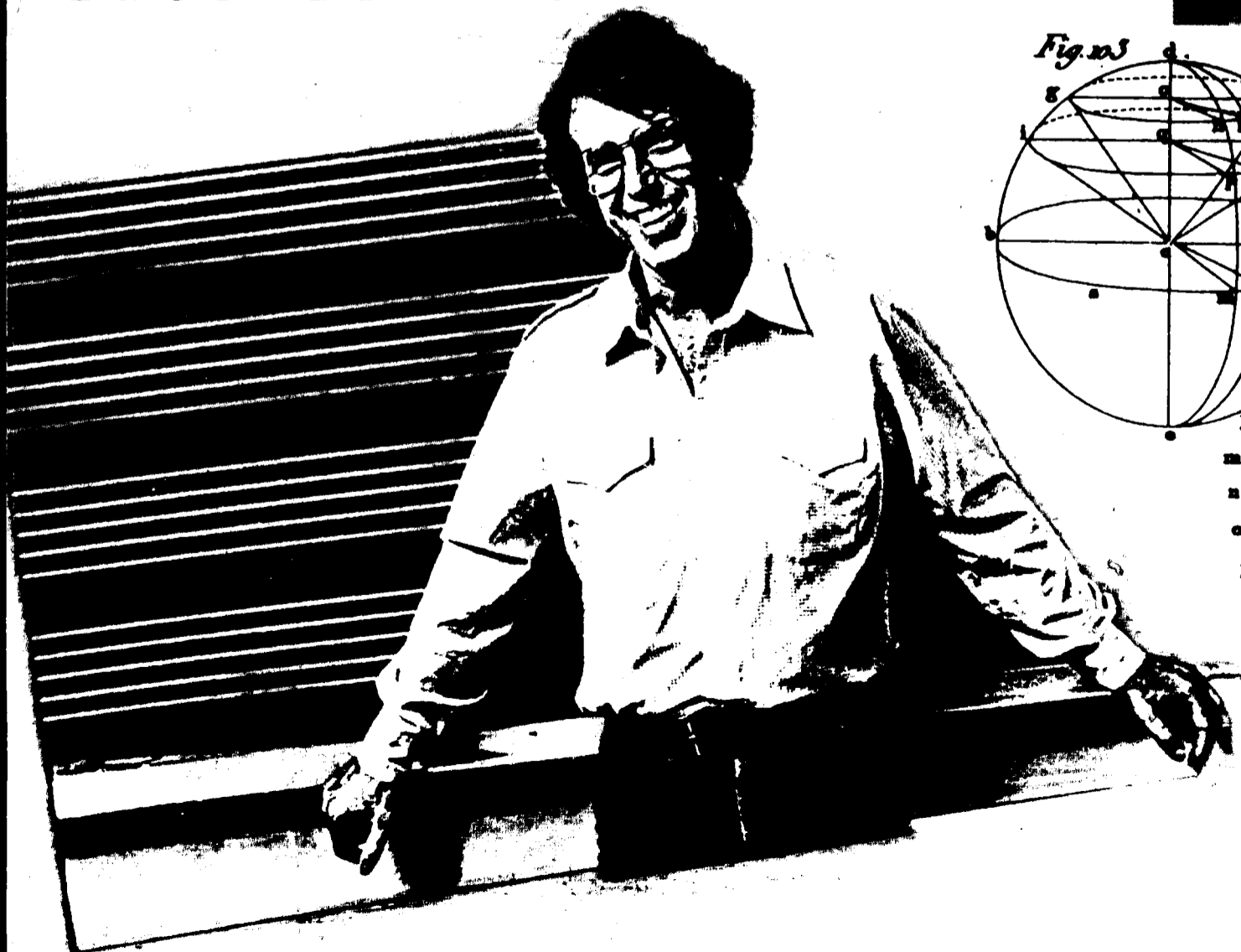
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**Catalog**  
**1987-88**



N A T U R A L & S O C I A L S C I E N C E S



E N G I N E E R I N G



# CORRESPONDENCE DIRECTORY

## Admissions

Undergraduate

Registrar & Admissions

Building 301, Matthews Administrative and Academic Complex, Q-021-A,  
(619) 534-3160

Graduate

(Address the appropriate  
department of instruction.)

School of Medicine

Admissions Office

162 Medical Teaching Facility, M-021, 534-3880

## Registration

Registrar & Admissions

Building 301, Matthews Administrative and Academic Complex, Q-021-A, 534-3150

## Housing

Undergraduate

Housing Administration

Building 206, Matthews Administrative and Academic Complex, Q-041, 534-4010

Married Students

Residential Apartments Office

9224 B Regents Road, S-007, 534-2952

Graduate Apartments

Residential Apartments Office

9224 B Regents Road, S-007, 534-2952

Off-Campus Housing

Office of Housing Services

Building B - Student Center, B-009, 534-3670

## Residence Status

Registrar & Admissions

Building 301, Matthews Administrative and Academic Complex, Q-021-A, 534-3152

## Financial Aids

(Loans & Grants for  
Undergraduate and  
Graduate Students)

Student Financial Services

Building 210, Matthews Administrative and Academic Complex, Q-013, 534-4480

## Scholarships

(For Undergraduates)

Student Financial Services

Building 210, Matthews Administrative and Academic Complex, Q-013, 534-4480

## Fellowships

Office of Graduate Studies  
and Research

Building 409, Matthews Administrative and Academic Complex, Q-003, 534-3556

## Teaching and Research Assistantships

(Address the appropriate  
department of instruction.)

## Employment

On-campus

Student Employment Office

Building 204, Matthews Administrative and Academic Complex, Q-013

Off-campus

534-4472

534-0148

## Student Activities

Student Center

Student Center, B-023, 534-3362

## Foreign Students' Affairs

Office of International  
Education

International Center, Q-018, 534-3730

## Educational Opportunity Program (EOP)

Educational Opportunity  
Program/Office of Relations  
with Schools

Student Center, Building B, B-037, 534-4831

## Graduate Student Affirmative Action

Office of Graduate Studies  
and Research

Building 409, Matthews Administrative and Academic Complex, Q-003, 534-3871

## Graduate Women's Program

Office of Graduate Studies  
and Research

Building 409, Matthews Administrative and Academic Complex, Q-003, 534-3871

## Provosts

John Muir College

H&SS Building

Muir Campus, C-006, 534-3583

Revelle College

Revelle Provost Building

Revelle Campus, B-021, 534-3262

Third College

Third College Provost Building

Third Campus, D-009, 534-4002

Earl Warren College

Building 302

Matthews Administrative and Academic Complex, Q-022, 534-4350

## Dean of Graduate Studies and Research

Office of Graduate Studies  
and Research

Building 409, Matthews Administrative and Academic Complex, Q-003, 534-6654

## Campus Directory Information

(619) 534-2230

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**NOTE:**

While efforts have been made to assure the accuracy of statements in this catalog, it must be understood that all courses, course descriptions, designations of instructors, and all curricular and degree requirements contained herein are subject to change or elimination without notice. Students should consult the appropriate department, school, college or graduate division for current information, as well as for any special rules or requirements imposed by the department, school, college, or graduate division.

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# ACADEMIC AND ADMINISTRATIVE CALENDAR, 1987-88

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## Fall Quarter, 1987

Fall Quarter begins . . . . . Thursday, September 17  
Instruction begins . . . . . Tuesday, September 22  
Thanksgiving Holiday . . . . . Thursday-Friday, Nov. 26-27  
Instruction ends . . . . . Friday, December 4  
Final Exams . . . . . Monday-Saturday, December 7-12  
Fall Quarter ends . . . . . Saturday, December 12  
Christmas Holidays . . . . . Thursday-Friday, Dec. 24-25  
New Year Holidays . . . . . Thursday-Friday, Dec. 31-Jan. 1

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## Winter Quarter, 1988

Winter Quarter begins . . . . . Monday, January 4  
Instruction begins . . . . . Monday, January 4  
Academic and Administrative Holiday . . . . . Monday, January 18  
Academic and Administrative Holiday . . . . . Monday, February 15  
Instruction ends . . . . . Friday, March 11  
Final Exams . . . . . Monday-Saturday, March 14-19  
Winter Quarter ends . . . . . Saturday, March 19  
Academic and Administrative Holiday . . . . . Monday, March 21

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## Spring Quarter, 1988

Spring Quarter begins . . . . . Friday, April 1  
Instruction begins . . . . . Monday, April 4  
Memorial Day Holiday . . . . . Monday, May 30  
Instruction ends . . . . . Friday, June 10  
Final Exams . . . . . Monday-Saturday, June 13-18  
Spring Quarter ends . . . . . Saturday, June 18  
Independence Day Holiday . . . . . Friday, July 4  
Labor Day Holiday . . . . . Monday, September 5

University of California, San Diego

**Catalog Evaluation**

Please help us evaluate the effectiveness of the *General Catalog* by answering the following questions:

- 1. I find the catalog to be visually pleasing. \_\_\_\_\_ yes \_\_\_\_\_ no
- 2. The information in the catalog is clearly presented. \_\_\_\_\_ yes \_\_\_\_\_ no
- 3. The index seems to be complete. \_\_\_\_\_ yes \_\_\_\_\_ no
- 4. The UCSD *General Catalog* attracts me to the institution. \_\_\_\_\_ yes \_\_\_\_\_ no
- 5. Were any catalog sections confusing? If so, which ones? \_\_\_\_\_  
\_\_\_\_\_
- 6. Did you have trouble finding any information you needed? If so, what information was this? \_\_\_\_\_  
\_\_\_\_\_
- 7. Please list any additional information you would like to have included in the catalog, or any additional comments you have. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please check all applicable categories to describe yourself:

- \_\_\_\_\_ I am a potential UCSD applicant.
- \_\_\_\_\_ I have applied or definitely plan to apply to UCSD.
- \_\_\_\_\_ I have been accepted at UCSD.
- \_\_\_\_\_ I am a high school student: \_\_\_\_\_ freshman \_\_\_\_\_ sophomore  
\_\_\_\_\_ junior \_\_\_\_\_ senior
- \_\_\_\_\_ I am a two-year college student, contemplating transfer to UCSD.
- \_\_\_\_\_ I am a four-year college student, contemplating transfer to UCSD.
- \_\_\_\_\_ I am in college, contemplating graduate study in \_\_\_\_\_ (subject).
- \_\_\_\_\_ I am a UCSD student: \_\_\_\_\_ freshman \_\_\_\_\_ sophomore \_\_\_\_\_ junior  
\_\_\_\_\_ senior \_\_\_\_\_ medical student  
\_\_\_\_\_ graduate student in \_\_\_\_\_ (dept.)
- \_\_\_\_\_ I am a junior high school counselor.
- \_\_\_\_\_ I am a senior high school counselor.
- \_\_\_\_\_ I am a community college counselor.
- \_\_\_\_\_ I am a parent of a UCSD applicant or prospective applicant.
- \_\_\_\_\_ I am a UCSD faculty member.
- \_\_\_\_\_ I am a UCSD staff member.
- \_\_\_\_\_ I am a \_\_\_\_\_ faculty \_\_\_\_\_ staff member at \_\_\_\_\_
- \_\_\_\_\_ I reside in California.
- \_\_\_\_\_ I reside in another state or country.

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**To express our appreciation for your cooperation, a UCSD decal will be sent to participants in this survey.**

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\_\_\_\_\_  
State

\_\_\_\_\_  
Zip Code

1372  
87/88

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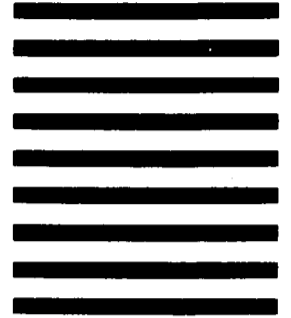
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# UNDERGRADUATE ADMISSION INFORMATION AND ENROLLMENT DEADLINES

|  | <b>Fall<br/>Quarter<br/>1987</b> | <b>Winter<br/>Quarter<br/>1988</b> | <b>Spring<br/>Quarter<br/>1988</b> |
|--|----------------------------------|------------------------------------|------------------------------------|
| <b>ADMISSION</b><br>Opening date for filing application materials  | Nov. 1, '86                      | July 1, '87                        | Oct. 1, '87                        |
| <b>PRIORITY DEADLINE FOR APPLICATIONS<br/>FOR SCHOLARSHIPS</b>   | Mar. 2                           |                                    |                                    |
| <b>ENROLLMENT:</b><br><b>CONTINUING STUDENTS</b><br>Preferred Enrollment   | May 14-20                        | Nov. 5-11                          | Feb. 18-24                         |
| <b>NEW STUDENTS</b><br>Preferred Enrollment completed by   | Sept. 17                         | Dec. 22                            | Mar. 30                            |
| <b>FEES DUE</b><br>Fees are due and payable upon<br>receipt of Registration Form.<br>See Late Penalties Section. |                                  |                                    |                                    |
| <b>QUARTER BEGINS</b>  | Sept. 17                         | Jan. 4                             | Apr. 1                             |
| <b>INSTRUCTION BEGINS</b>  | Sept. 22                         | Jan. 4                             | Apr. 4                             |
| <b>ALL STUDENTS: LATE REGISTRATION</b><br>Last day without \$50 late<br>payment fee                              | Sept. 25                         | Jan. 7                             | Apr. 7                             |
| Last day without \$50 late<br>enrollment fee   | Oct. 5                           | Jan. 15                            | Apr. 15                            |
| <b>DEADLINE FOR CHANGE OF PROGRAM</b><br>Adding Courses  | Oct. 5                           | Jan. 15                            | Apr. 15                            |
| Dropping courses without late fee  | Oct. 5                           | Jan. 15                            | Apr. 15                            |
| Changing to or from P/NP   | Oct. 5                           | Jan. 15                            | Apr. 15                            |
| Dropping course without "W"<br>appearing on transcript   | Oct. 19                          | Jan. 29                            | Apr. 29                            |
| Dropping courses without<br>penalty of "F" grade   | Nov. 23                          | Mar. 4                             | June 3                             |
| <b>INSTRUCTION ENDS</b>  | Dec. 4                           | Mar. 11                            | June 10                            |
| <b>FINAL EXAMINATIONS</b>  | Dec. 7-12                        | Mar. 14-19                         | June 13-18                         |
| <b>DEADLINE FOR REMOVING INCOMPLETE<br/>GRADES (I) ASSIGNED IN PRIOR QUARTER</b>                                 | Dec. 11                          | Mar. 18                            | June 17                            |
| <b>QUARTER ENDS</b>  | Dec. 12                          | Mar. 19                            | June 18                            |
| <b>COMMENCEMENT</b>  |                                  |                                    | June 19                            |
| <b>GRADES MAILED TO ALL<br/>STUDENTS (APPROXIMATE)</b>   | Jan. 4                           | Apr. 11                            | July 5                             |

Dates are subject to change without notice.

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# **GRADUATE ADMISSION INFORMATION AND ENROLLMENT DEADLINES**

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|   | <b>Fall<br/>Quarter<br/>1987</b> | <b>Winter<br/>Quarter<br/>1988</b> | <b>Spring<br/>Quarter<br/>1988</b> |
|---|----------------------------------|------------------------------------|------------------------------------|
| <b>ADMISSION</b><br>Applicants should check with their prospective departments for deadline dates   |                                  |                                    |                                    |
| <b>APPLICATIONS FOR FELLOWSHIPS:</b><br>Deadline date for filing application materials  | Jan. 15 '88                      |                                    |                                    |
| Notice of Awards  | Apr. 1                           |                                    |                                    |
| Acceptance of Awards  | Apr. 15                          |                                    |                                    |
| NOTE: Most departments adhere to the above for assistantships also, but many will accept later applications   |                                  |                                    |                                    |
| <b>ENROLLMENT:</b><br>CONTINUING STUDENTS (Preferred)   | May 14-20                        | Nov. 5-11                          | Feb. 18-24                         |
| NEW STUDENTS  | Sept. 22                         | Dec. 29                            | Mar. 25                            |
| <b>APPLICATION FOR INTERCAMPUS EXCHANGE PROGRAM</b>   | Aug. 25                          | Dec. 7                             | Mar. 7                             |
| <b>FILING APPROVED LEAVE OF ABSENCE</b>   | Oct. 2                           | Jan. 15                            | Apr. 15                            |
| <b>SCHOOL OF MEDICINE DEADLINES</b><br>(Refer to School of Medicine announcement for deadlines)   |                                  |                                    |                                    |
| <b>QUARTER BEGINS</b>   | Sept. 17                         | Jan. 4                             | Apr. 1                             |
| <b>INSTRUCTION BEGINS</b>   | Sept. 22                         | Jan. 4                             | Apr. 4                             |
| <b>LATE REGISTRATION</b><br>Payment of fees after this date requires payment of \$50 penalty fee  | Sept. 25                         | Jan. 7                             | Apr. 7                             |
| Enrollment after this date requires payment of \$50 penalty fee   | Oct. 5                           | Jan. 15                            | Apr. 15                            |
| Enrollment and payment of fees after this date requires a General Petition and payment of \$50 for late enrollment and \$50 for late payment of fees, totaling \$100. | Oct. 5                           | Jan. 15                            | Apr. 15                            |

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|  |                    |            |                                    |
|--|--------------------|------------|------------------------------------|
| DEADLINE FOR CHANGE OF PROGRAM<br>Adding or dropping courses without<br>\$3 penalty  | Oct. 5             | Jan. 15    | Apr. 15                            |
| CHANGE OF GRADING OPTION   | Oct. 5             | Jan. 15    | Apr. 15                            |
| DEADLINE FOR DROPPING CLASSES<br>WITHOUT "W" APPEARING ON<br>THE TRANSCRIPT  | Oct. 19            | Jan. 29    | Apr. 29                            |
| MASTER'S DEGREE<br>Filing for advancement to candidacy   | Oct. 2             | Jan. 15    | Apr. 15                            |
| Filing approved thesis   | Dec. 11            | Mar. 18    | June 17                            |
| DOCTOR OF PHILOSOPHY DEGREE<br>Filing draft dissertation<br>with doctoral committee  | Nov. 16            | Feb. 22    | May 23                             |
| Filing approved dissertation and<br>- related materials  | Dec. 11            | Mar. 18    | June 17                            |
| GRADUATE RECORD EXAMINATION (GRE)<br>TEST DATES  | Oct. 10<br>Dec. 12 | Feb. 6     | Apr. 9<br>June 4<br>(General Only) |
| DROPPING CLASSES WITHOUT PENALTY<br>OF "F" GRADE   | Nov. 23            | Mar. 4     | June 3                             |
| <b>INSTRUCTION ENDS</b>  | Dec. 4             | Mar. 11    | June 10                            |
| FINAL EXAMINATIONS   | Dec. 7-12          | Mar. 14-19 | June 13-18                         |
| REMOVING INCOMPLETE GRADES (I)<br>ASSIGNED IN PRIOR QUARTER  | Dec. 11            | Mar. 18    | June 17                            |
| <b>QUARTER ENDS</b>  | Dec. 12            | Mar. 19    | June 18                            |
| COMMENCEMENT   |                    |            | June 19                            |
| COMPLETION OF REQUIREMENTS<br>Final date for completion of all requirements<br>for degrees to be awarded at end of quarter | Dec. 11            | Mar. 18    | June 17                            |
| GRADES DISTRIBUTED TO ALL STUDENTS<br>(APPROXIMATE)  | Jan. 4             | Apr. 11    | July 5                             |

\*Subject to change

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# INTRODUCTION

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## A MAJOR DECISION

Choosing a college or university is clearly among the most decisive choices of a lifetime. The direction and tenor of a student's future will inevitably be deeply influenced by the experiences of the undergraduate years. The choice of a college or university should, therefore, be made with seriousness and deliberation, not casually.

At this moment, you may be considering the merits of several institutions of higher learning, in order to make an informed and intelligent choice. What qualities and assets might make UCSD attractive to you? What might make you decide to apply elsewhere?

These and other related questions will be addressed in this brief introduction. The information presented here should help you to decide whether UCSD can provide the kind of education for which you are best suited.

For it should be clearly understood that UCSD exists primarily for one fundamental purpose: to educate. UCSD is intellectually challenging and academically intensive. Although its site is appealing, UCSD is not a coastal playground in which to amuse oneself while waiting to enter "the real world." UCSD is, in fact, a significant part of the real world; it is a *working* university which fosters effort and honors achievement.

The student who enters UCSD with this concept clearly in mind will find the experience of the undergraduate years here powerfully rewarding. The rewards will come not only in intellectual satisfaction, but also in philosophical enrichment and in the benefits of social life. Here at UCSD, on the bluffs overlooking the Pacific, students work and live in an environment shared with a faculty whose research and teaching are recognized for excellence virtually around the world. And here, on this beautiful 1,200-acre wooded campus, students make friendships that will carry meaning all their lives.

## A FEW WORDS OF HISTORY

UCSD, one of the newest of the nine campuses which make up the University of California system, celebrated its twenty-fifth anniversary during the 1985-86 academic year. The other campuses of the University of California are located in Berkeley, Davis, San Francisco, Santa Cruz, Santa Barbara, Riverside, Los Angeles, and Irvine. Each campus has its own distinct academic and social character. And each offers programs and facilities which set it off from the others. UCSD is unique not only in those features, but also in its history.

As a member of the nine-campus family of the University of California, UCSD is, despite its newness, fully a university in scale and scope. Graduate and undergraduate programs are offered in a wide range of disciplines, leading to the bachelor's, master's, M.D., and Ph.D. degrees. UCSD's Scripps Institution of Oceanography is internationally renowned, and UCSD's School of Medicine has won national acclaim for excellence. At both the undergraduate and graduate levels, UCSD's curricula and programs have been singled out for high rankings in recent surveys of American higher education.

UCSD enrolled its first undergraduates in 1964. Nevertheless, the campus can trace its origins in this area as far back as the late 1800s. At that time, zoologists on the Berkeley campus, seeking a suitable location for a marine field station, found La Jolla a very desirable site. The facility they established became a part of the University of California in 1912, and was eventually named the Scripps Institution of Oceanography. When, in the late 1950s, the Regents of the University of California decided to situate a general campus in the San Diego region, the Scripps Institution and its small but distinguished staff of scientists formed the nucleus around which the new campus was to grow.

Today UCSD is recognized throughout the academic world both for the eminence of its faculty and for the quality of its graduate and undergraduate programs.

The history of its growth may help to explain how, in the short span of some three decades, UCSD has been able to achieve a stature comparable to that of institutions which were founded a century or more ago.

The growth of UCSD did not happen by accident. The rise to distinction resulted from wise and careful planning by visionary faculty and administrators. To accomplish the bold objective of creating a first-rate university in a remarkably short time, these planners sought from the outset to attract the best scholars the academic world could offer, and to build the new campus around them.

Thanks to the foresight of those planners, the faculty of UCSD now includes five Nobel laureates (four of whom hold joint appointments with the nearby Salk Institute); two winners of the Fields Medal in mathematics; forty-five members of the National Academy of Sciences; fifty-one Fellows of the American Academy of Arts and Sciences; nine Fellows of the American Philosophical Society; seven members of the National Academy of Engineering; eight members of the International Academy of Astronautics; six members of the Institute of Medicine; three members of the National Academy of Education and a winner of a Tony award for lighting.

Nationwide, UCSD ranks second only to the California Institute of Technology in the ratio of National Academy of Sciences members to total faculty, with a ratio of one NAS member in ten faculty.

The vision of UCSD's planners is being fulfilled as well through the distinguished reputation of the programs and curricula offered by its much-honored faculty. A survey published by the education editor of *The New York Times* listed UCSD among the nation's top-ranking institutions. Of the 265 colleges and universities evaluated for "academics, quality of life, and social life," UCSD ranked among the top fifteen. UCSD shared that rating-level with such venerable and renowned institutions as Harvard, Yale, Smith, and Wellesley.

In addition, UCSD is officially accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges.

## OTHER POINTS TO CONSIDER

There are certain other facts about UCSD which you should consider in making your choice. Among them are:

- UCSD, a full-fledged, four-year undergraduate campus, is also a full-fledged graduate and research institution. Why is UCSD's strength in graduate teaching and research of importance to undergraduates? The answer is at once simple and profound: UCSD faculty and scholars are continually involved in an impressive variety of research and developmental projects which puts this campus on the cutting edge of science and technology, and in the forefront in the arts and humanities. The excellence of the faculty at the graduate level affects the style and quality of instruction at all levels of the institution, including the undergraduate.
- In recent statistics, UCSD ranked first in the United States in the dollar value of funds received from the National Science Foundation for research, and fifth in the nation in the dollar value of total federal research and development funding from all agencies.
- UCSD's retention rate. Of all undergraduates enrolled each fall quarter who do not receive degrees during the year, more than 80 percent return the next fall. This returning-student percentage has increased substantially during the past several years, reflecting expanded academic programs, improvements in undergraduate course offerings, and overall improvement in the quality of student life on campus.
- San Diego has become one of America's major centers for high-technology electronics and biomedical industries. Students concentrating on sciences or engineering are actively sought by these industries to fill summer jobs and career positions. Off-campus internships also are available to UCSD students in all fields of study, with opportunities to serve at local television stations, in charity organizations, and in local, state, and federal government agencies as well as in a diverse array of local businesses.
- UCSD is recognized nationally as a major center for the arts and humanities, and the theater.
- Undergraduates are offered opportunities to participate in certain research projects conducted by UCSD faculty. An example is UCSD's nationally famed PASCAL program, which was developed by a group of undergraduate students in UCSD's computer laboratories. PASCAL is credited by leaders in the microcomputer field with revolutionizing the writing of computer programs. A number of UCSD undergraduates have developed skills in the computer field which have led to their employment by leading computer manufacturers, and still others have gone on to form their own software enterprises as a direct result of their UCSD training.
- UCSD's unique small-college structure encourages undergraduates to play a more active role in student government, social life, and athletics than is generally open to them in other major universities. Opportunities for involvement in student governance are especially strong, as there are student governing bodies at the campus-wide level as well as within the four separate colleges.
- UCSD fields twenty-eight men's and women's intercollegiate athletic teams. Campus athletic facilities include two gymnasiums, two swimming pools (one twenty-five yard, one fifty-meter), and numerous tennis and handball courts. The university's recreational and intramural athletic programs are among the most varied and extensive in the nation today.

## MAJOR FIELDS OF STUDY

UCSD offers a wide variety of nationally-recognized majors in a broad array of fields, summarized in the list below. New programs with strong emphasis on fundamentals have been developed without the encumbrances of tradition. Increasing numbers of highly qualified students are being attracted to these innovative programs, and by the opportunity to study with an outstanding faculty.

## Departmental Undergraduate Majors

### ANTHROPOLOGY

Anthropology

### APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)

Applied Mechanics  
Bioengineering  
Bioengineering: Premedical  
Systems and Control Engineering  
Chemical Engineering  
Engineering Sciences  
Mechanical Engineering  
Structural Engineering

### BIOLOGY

General Biology  
Animal Physiology  
Biochemistry and Cell Biology  
Ecology, Behavior, and Evolution  
Microbiology  
Molecular Biology

### CHEMICAL ENGINEERING (see AMES)

### CHEMISTRY

Chemistry  
Chemistry/Biochemistry  
Chemistry/Chemical Physics  
Chemistry with Specialization in Earth Sciences

### COMMUNICATION

Communication

### COMPUTER SCIENCE AND ENGINEERING (CSE)

Computer Science  
Computer Engineering

### ECONOMICS

Economics  
Management Science

### EDUCATION (see Footnote 1)

### ELECTRICAL AND COMPUTER ENGINEERING (ECE)

Applied Physics  
Information Science  
Computer Engineering  
Electrical Engineering  
Engineering Physics

### ENGINEERING (see AMES, CSE, and ECE)

### ENGLISH (see Literature)

### HISTORY

History

### LINGUISTICS

Linguistics

### LITERATURE

English and American Literature  
French Literature  
General Literature  
German Literature  
Spanish Literature  
Literature/Writing

### MANAGEMENT SCIENCE (see Economics)

### MATHEMATICS

Mathematics  
Applied Mathematics  
Applied Mathematics (Scientific Programming)  
Mathematics — Computer Science

### MUSIC

Music  
Music/Humanities

### PHILOSOPHY

Philosophy

### PHYSICS

Physics  
Physics/Biophysics  
Physics/Biophysics (Pre-medical)  
Physics with Specialization in Earth Sciences

### POLITICAL SCIENCE

Political Science

### PRELAW (see Footnote 2)

### PREMEDICAL (see Footnote 3)

### PSYCHOLOGY

Psychology  
Cognitive Science

### SOCIOLOGY

Sociology

### TEACHER EDUCATION (see Footnote 1)

### THEATRE

Drama

### VISUAL ARTS

Studio  
Art History/Criticism  
Media

### INTERDISCIPLINARY MAJORS (see Footnote 4)

Chicano Studies  
Chinese Studies  
Classical Studies  
College Special Individual Majors  
Italian Studies  
Judaic Studies  
Third World Studies  
Urban Studies and Planning

Footnote 1: The full teaching credential in California requires not a major in education, but in an academic subject or group of subjects, plus some special courses in educational topics, an approved program of practice teaching, and a full year of college work beyond the baccalaureate. The UCSD Teacher Education Program (TEP) leads to a partial multiple-subjects credential in elementary teaching, which provides temporary qualification as a teacher. To obtain the full credential, you must (within five years) teach a total of at least two years, and complete the required fifth year of college (which is not yet offered at UCSD). The main thrust of the TEP program is in child-centered multicultural education.

Footnote 2: Law schools do not require any particular major, but they do require evidence of good scholarship in demanding subjects. Almost any undergraduate major can qualify a student for consideration by a law school. The UCSD staff includes professional prelaw advisers.

Footnote 3: Like law schools, medical schools do not generally demand a particular major, but ask for a solid background in the sciences upon which medicine is built. Most premed students major in biology, chemistry, physics or bioengineering, but a substantial number major in the humanities and social sciences. The UCSD staff includes professional premedical advisers.

Footnote 4: Interdisciplinary majors usually consist of a prescribed collection of courses from two or more departments. Students interested in such majors should consult the "Courses, Curricula, and Programs of Instruction" section at the back of this catalog.



The academic departments of UCSD are listed below. Details and requirements of the various individual courses are found in the "Courses, Curricula, and Programs of Instruction" section of the catalog.

UCSD has deliberately chosen to limit the number of its academic departments. For example, there is only one Department of Literature, and the major sub-areas of biology are not fragmented into separate departments. This system has proved especially valuable to undergraduates who choose to avoid overspecialization early in their studies.

A number of special, individually oriented programs are available which utilize the combined resources of two or more departments. Among these are Chicano Studies, Chinese Studies, Classical Studies, Japanese Studies, the Teacher Education Program, Third World Studies, and Urban Studies and Planning.

Engineering students may choose from a number of majors in the Department of

Applied Mechanics and Engineering Sciences (AMES), the Department of Computer Science and Engineering (CSE), or the Department of Electrical and Computer Engineering (ECE). All three departments seek to educate the engineer of tomorrow, with increased emphasis on computer methods and systems science.

Undergraduates interested in premedicine and prelaw majors should note that a variety of departments can serve their needs. For premed students, the common choices are biology, chemistry, psychology, and bioengineering (AMES). However, more and more students are electing double majors, or are combining nontraditional majors with science majors. For prelaw students, nearly any undergraduate major will qualify a student for admission to a law school.

Should you need help in deciding upon a major, many UCSD professionals are available to aid you. Among them are the academic advisers in the provosts' offices of the various colleges, faculty members, and departmental advisers (who can help you to select an appropriate curriculum). Additional specialists are available in the Career Services Center, and in Psychological and Counseling Services, to help you appraise your personal aptitudes.

## Undergraduate Departments

### ARTS

Music  
Theatre  
Visual Arts

### DIVISION OF ENGINEERING

AMES (Applied Mechanics and Engineering Sciences)  
CSE (Computer Science and Engineering)  
ECE (Electrical and Computer Engineering)

### HUMANITIES

History  
Literature  
Philosophy

### SCIENCE AND MATHEMATICS

Biology  
Chemistry  
Mathematics  
Physics

### SOCIAL SCIENCE

Anthropology  
Communication  
Economics  
Linguistics  
Political Science  
Psychology  
Sociology

## SPECIAL DEPARTMENTAL EMPHASES

The following are some special departmental emphases about which you may wish to be informed:

- UCSD has three departments that offer both undergraduate and graduate degrees in *engineering*. Majors include applied mechanics, applied physics, bioengineering, bioengineering: premedical, chemical engineering, computer engineering, electrical engineering, engineering physics, engineering science, information science, systems science, mechanical engineering, structural engineering, applied mechanics, applied ocean science, computer science, and communication theory and systems.

- An undergraduate major in biochemistry and cell biology is offered by the Department of Biology. An undergraduate major in chemistry/biochemistry is offered by the Department of Chemistry. These majors are described in the biology and chemistry sections of this catalog. Both the Department of Biology and the Department of Chemistry offer graduate programs with specialization in biochemistry.
- The Department of Visual Arts offers excellent programs in fine arts studio work, art history and criticism, and media and visual arts. However, UCSD offers no courses in commercial art.
- The Department of Psychology offers courses in all major areas of experimental psychology, with choices of experimental approaches. The department also offers a general psychology major and a psychology (cognitive science) major, but nothing in the fields of humanistic psychology or clinical psychology.
- The Teacher Education Program (TEP) offers a program of study leading to the preliminary and clear multiple subjects credential. Graduates of this program are qualified for teaching positions in grades K-6 and in some cases, through grade 9.

## SUMMER SESSION

UCSD offers a Summer Session consisting of a diverse range of courses selected from the regular undergraduate curriculum and taught by UCSD faculty. In addition, Summer Session provides special educational opportunities not easily available during the regular school year, offers expanded opportunities for international education, and gives students a chance to enjoy courses featuring innovative formats or content, or taught by new or visiting faculty.

The Summer Session program is open to UCSD students, students of other colleges and universities, qualified high school seniors, and the general public. Credit courses designed to meet the advanced educational needs of selected professionals, such as teachers and engineers, are also offered.

Summer Session catalogs and registration forms are available in mid-March of each year. For free copies write to Summer Session Office, Mail Code X-004, University of California, San Diego, La Jolla, CA 92093, or call (619) 534-4364.

## WHAT UCSD DOES NOT OFFER

Although the range and variety of programs offered at UCSD are very wide, there are certain disciplines which are not available on this campus. In some instances, the absence of a particular program reflects the academic philosophy of the UCSD campus and its faculty. In others, the absence of a curriculum is temporary, awaiting the availability of funds, personnel, or facilities before a program can be offered. In still others, programs have not been included which would, in the university's judgment, unnecessarily duplicate comparable offerings on other UC campuses or at other institutions.

Among undergraduate majors presently not available at UCSD are:

- Business.
- Oceanography. Although UCSD does not offer an undergraduate major in oceanography, students planning to pursue oceanography at the graduate level may select from a large number of undergraduate courses in the physical, biological, and earth sciences to build a firm foundation for later graduate work.
- Nursing.
- Industrial Arts.
- Journalism. Although no major in journalism is offered, the Department of Literature offers a major in writing which can emphasize journalistic writing, and the development of writing skills is stressed in many disciplines. Many courses are offered in the humanities and social sciences which will provide the kind of broad-based preparation needed by practicing journalists. Several student newspapers are published on campus, providing ample "laboratory" opportunities for students to practice journalism.
- Geography.
- Physical Education. However, a minor in physical education is offered. Note: UCSD does not offer athletic scholarships, and there is no intercollegiate football team at UCSD.

## THE COLLEGES OF UCSD

UCSD undergraduates enjoy the benefits of a great university without the disadvantages of "bigness" found in many of today's "mega-universities." The master plan conceived by UCSD's planners borrowed from the Oxford and Cambridge concept to provide a "family" of colleges, each with its own special academic and social "flavor." UCSD's students thus gain a sense of "belonging" through affiliation with one of the campus's semiautonomous colleges.

Presently there are four colleges: Revelle, John Muir, Third, and Earl Warren. Each of the four is independent, yet all are interrelated: all university academic and support facilities are available to all students, regardless of their college affiliation.

Each college is designed to accommodate approximately 2,500 students. Each has its own residence halls, commons (which include dining facilities and meeting rooms), and classrooms. Each college has its own educational philosophies and traditions, its own set of general-education requirements, and its own administrative and advising staff. The objective is to give students and faculty the advantages of a small, liberal-arts college combined with the best features of a major university.

Students applying to UCSD should select a college in order of their preference.

Details regarding the individual colleges are given in the "Choosing a College at UCSD," section of the catalog.

## RECREATION AT UCSD

UCSD's undergraduate colleges are situated on a park-like, 1,200-acre site high on the bluffs overlooking the Pacific Ocean at La Jolla. Long famed as a vacation and retirement community, La Jolla boasts some of the finest beaches and coves, restaurants, art galleries, and other attractions in the nation.

Much of UCSD's recreational and social life centers on the waterfront, with surfing, SCUBA diving, and beach parties among the favorite diversions of UCSD students. Throughout the area, students find a variety of amusements, ranging from the small-town atmosphere of waterfront Del Mar southward to the open-air markets of Tijuana and the primitive wilderness of Mexico's Baja California peninsula.



The city of San Diego, some twelve miles south of the campus, offers a wide range of recreational opportunities including Old Town (California's birthplace), Sea World in Mission Bay, and the world-famous San Diego Zoo and Wild Animal Park. A year-round calendar of major league sporting events is offered in the city's Sports Arena and in San Diego Jack Murphy Stadium, home of the Padres and the Chargers.

For theater-lovers there's the Old Globe Theater in Balboa Park, site of the National Shakespeare Festival every summer. A year-round program of contemporary and classical professional theater may be enjoyed in the Old Globe and the adjacent Cassius Carter Center Stage, and special summer theater fare is featured on the park's outdoor Festival Stage.

On-campus entertainment includes a year-round series of movies and cultural programs, dances, chamber music, and rock-band concerts sponsored by the University Events Office. The Department of Theatre presents plays in both the 200-seat UCSD Theatre and the 500-seat Mandell Weiss Center for the Performing Arts. The Department of Visual Arts offers a continuing series of art shows in the Mandeville Art Gallery, and displays of student art in other campus galleries.

Informal meeting places on campus are hubs of student activity throughout the day and evening, among them the Triton Pub, Muir Rathskeller, the Ice Cream Hustler, and Third College Mountain View Lounge.

## **MOUNTAINS, DESERTS, AND BEACHES**

Many Southern Californians live out-of-doors the year around. The San Diego metropolitan area — which includes the UCSD campus — enjoys the most comfortable climate in the United States, twelve months of the year.

Fishing opportunities are plentiful offshore in kelp beds west of La Jolla, and surrounding the Coronado Islands in Mexican waters. Bass and trout fishing are available in nearby lakes. An hour's drive

to the east, the Laguna Mountains provide pleasure at all seasons for campers and hikers. Beyond the Lagunas lies the vast Borrego Desert with its breathtaking display of wildflowers every spring.

The peninsula of Baja California, one of the world's last great wilderness areas, stretches for 900 miles southward from the international gateway at Tijuana. The peninsula — a mecca for lovers of unspoiled beaches and untouched mountains and deserts — is the site every year of the grueling Baja cross-country auto race.

## **"MOST SPORTS-MINDED CAMPUS IN AMERICA"**

Through its intercollegiate athletic and intramural programs, UCSD provides its students with one of the more extensive and competitive sports programs in the United States. UCSD fields twenty-eight intercollegiate athletic teams along with seven club sports teams while the intramural program provides for student competition in twenty sports in three levels of play: men, women, and coed.

Intramural sports are highly popular with UCSD students. An estimated 60 percent of all students take part in one or more of the more than 1,500 teams involved in various sports during the course of the academic year.

In recent years, UCSD's intercollegiate athletic teams have attained a level of excellence that has established UCSD as one of the most respected athletic programs in the NCAA Division III. The women's volleyball teams won the NCAA Division III title in 1981, 1984 and 1986 while finishing second in 1982 and 1983 and producing ten All-Americans and one Division III Player of the Year in a four-year span. The men's swimming team placed third and the women's team fifth at the 1984 NCAA National Championships with a school-record eighteen Tritons earning All-American laurels.

The list goes on: the women's tennis team placed second and the men's fifth in 1984 with five players earning All-American honors. The men's water polo team ended its season ranked sixteenth in the only level of NCAA competition. The men's golf team ranked fourteenth nationally while the men's cross country team captured its first-ever regional championship enroute to a twelfth place finish at the NCAA Championships.

In 1982, the university's Triton baseball team was invited to the People's Republic of China — the first American baseball team ever to play in mainland China. The Tritons won two, lost one, and tied one during the tour.

A new \$1.8 million outdoor athletic facility includes a fifty-meter competition-sized swimming pool, a whirlpool bath, four racquetball/handball courts among other facilities. This facility supplements the existing twenty-five-yard indoor natatorium, gymnasiums, tennis and handball courts, and various athletic fields elsewhere on the campus.

## **NEED MORE INFORMATION? CHECK THE FOLLOWING:**

- How do I apply for admission? See page 47. (See also "Note," below.)
- How much does a UCSD education cost? See "Fees and Expenses," page 54.
- What's the grading system at UCSD? See page 67.
- How should I decide which college to choose at UCSD? See page 7.
- What services and facilities are available to students at UCSD? See page 101.
- Where do I write for more information? See inside front cover.

NOTE: An admissions packet for students interested in applying to UCSD can be obtained from any California high school or junior college counselor's office. Out-of-state students may request a packet by writing to the Office of Admissions on any University of California campus.

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# Choosing a College at UCSD

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One of the features which sets UCSD apart from most major universities in the United States is its family of small colleges: Revelle, John Muir, Third, and Earl Warren.

The division of UCSD's campus community into small undergraduate colleges was purposeful, and not a chance event. Planners of the new campus examined the various alternatives available, and decided upon the small-college concept which has served Oxford and Cambridge so successfully for centuries. The planners were convinced that many — if not most — students learn more, and find greater fulfillment in their personal lives, when they are joined academically and socially with a relatively small group of fellow students and faculty. But the planners also understood that there are many advantages to "bigness" in a university: a faculty of international renown, first-rank teaching and research facilities, laboratories, libraries, and other amenities of size.

These planners wisely determined, therefore, to create an arrangement which would combine the best aspects of a large research university with the finest features of a small, liberal-arts college. The answer was — and is — the UCSD collegiate system, a series of semiautonomous undergraduate colleges, each with its own faculty, residential and academic facilities, and distinctive educational philosophy. The system was inaugurated with the opening of Revelle in 1964. In the intervening years, three more colleges — Muir, Third, and Warren — have been established, and future plans call for the opening of Fifth College in the fall of 1988. The separate college structure may be found today on many American university campuses. However, in most cases these colleges are designed to serve specific disciplines — engineering, agriculture,

and business administration, as examples. This is not the case at UCSD. Instead, at UCSD any undergraduate may select a major from the full range of majors available. The choice of a college is based, therefore, not on one's major, but upon one's preferences in terms of the various educational philosophies, environments, and life-styles offered by the various colleges.

UCSD's college system allows undergraduates to choose among *five* distinct general-education curricula supplementing their major requirements. These curricula range from a very structured liberal-arts program to a program with a broad range of electives. By contrast, most universities offer only *one* general-education curriculum.

Students must select a college in order of preference when applying for admission.

Brief summaries of the various college life-styles and philosophies follow. Later in this section, these variations are spelled out in considerable detail, college by college.

## Revelle Educational Philosophy

Revelle College stresses the broad character of general education. During the first two years at Revelle, a student spends roughly one-third of his or her class time in mathematics and the natural sciences and the other two-thirds in social sciences, humanities, foreign language, and the fine arts. These two years of structured liberal-arts courses help to establish a strong educational foundation. Throughout the final two years, students concentrate on developing professional competence in one academic discipline and a basic understanding of another, unrelated academic field.

This curriculum develops three main skills which are essential for a well-rounded education: learning to use the language of scholarship and science, learning how to think creatively, and learning how to learn.

## Muir Educational Philosophy

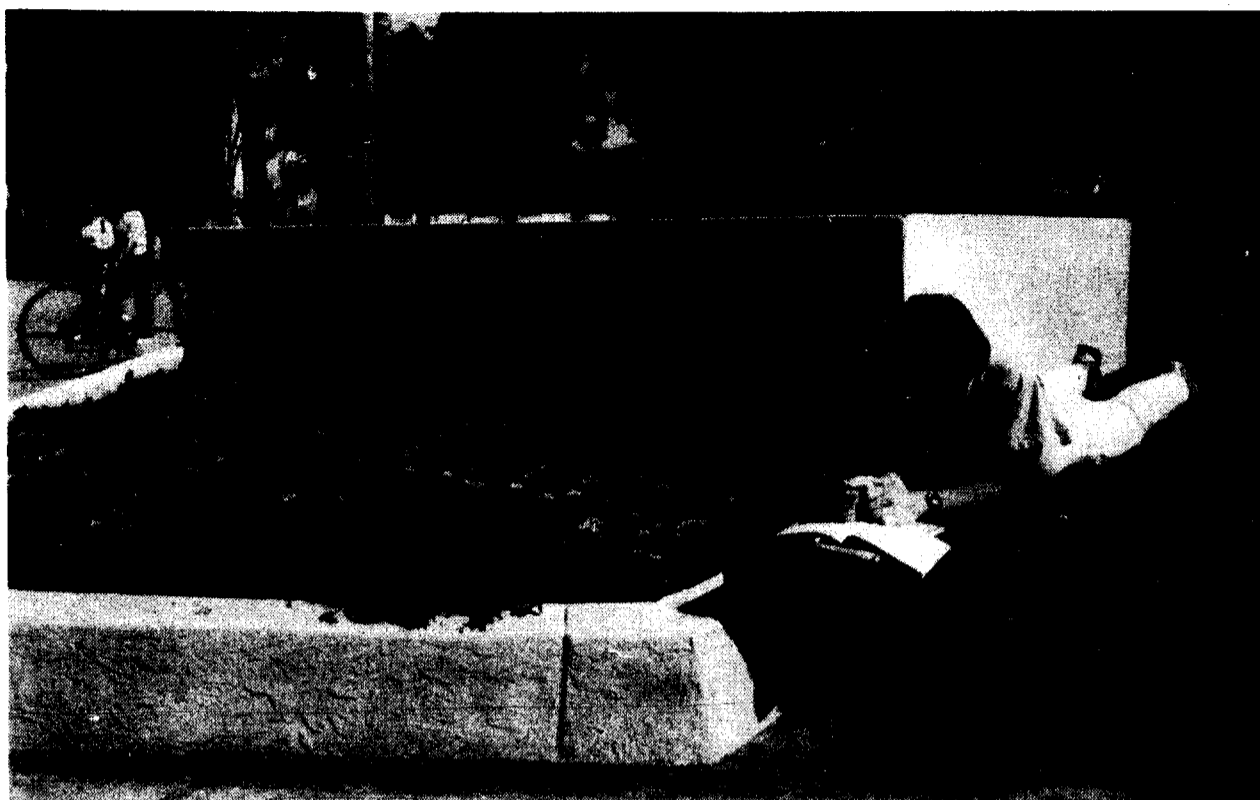
John Muir College is distinguished by its atmosphere of friendliness and informality, which involves deep concern for the rights and welfare of others. Concern for one's fellow students goes well with Muir's educational philosophy and requirements, which stress individual choice and development while assuring breadth and depth in learning. The atmosphere thus created, combining freedom with responsibility, has helped to make Muir the largest of the colleges.

Under Muir's general-education requirements, each student must complete one year-long sequence in the social sciences, one in mathematics or the natural sciences, and two from the areas of the humanities, fine arts, or foreign languages. In addition to the four year-long sequences, students must complete two college composition courses their first year in residence. With this academic approach, Muir students are offered diversity, academic scope, in-depth knowledge, and excellence.

## Third Educational Philosophy

The Third College educational philosophy is based on the belief that the best preparation for a complex and rapidly changing world is a broad liberal education, complemented by in-depth study in areas of the student's own choice based on individual academic interests and career goals. This educational approach has several major advantages which students find very beneficial:

1. It guarantees a basic understanding of the principal branches of knowledge: humanities and arts, social sciences, natural sciences, and mathematics.
2. It provides the flexibility required to enable students who have well-defined major interests and career goals to begin work on their majors as freshmen.



3. It provides a structure which guides students who have not decided on a major to sample an array of potential majors, while simultaneously satisfying the graduation requirements of the college.

### **Warren Educational Philosophy**

Warren College emphasizes curricula and programs that assist students in making a close connection between their undergraduate education and their personal and professional goals for their postbaccalaureate years. This approach applies to all students, whether their career aspirations lie in the professions, the arts, or the sciences. As a means of supplementing curricular requirements, the college encourages students to take advantage of academic internships and career-life planning programs to sharpen their skills and test their career choices.

Warren's requirements allow the student to choose three main areas of study: the major, and two secondary areas. Each student's educational plan must include areas of study chosen from the humanities and fine arts, the social sciences, and the sciences. Students will be required to study each of these areas in some depth, including upper-division course work in the secondary areas of study as well as in the major. By choosing an appropriate

major and secondary areas of study, students can make a significant link between their undergraduate education and their career goals.

### **Fifth College Educational Philosophy**

UCSD will open a fifth undergraduate college in fall 1988.

Fifth College will prepare students for careers and graduate programs in international affairs and business. Like the other colleges at UCSD, Fifth College students will be able to enter any major, but the general-education program of the college will give them a background in international studies and comparative culture.

### **Provosts**

The provost acts as the chief administrative officer and academic dean. Each college has its own provost, as well as an academic advising and dean's office. The academic advising staff provides such services as: student advising, conducts new student academic orientation/registration programs, maintains academic files, monitors students' academic progress and, in conjunction with the academic departments and the Office of the Registrar, certifies graduation.

The dean's office performs a variety of nonacademic services, such as assisting students to obtain a hearing when they feel they have been treated unfairly by a faculty or staff member; helping students to deal with decisions and procedures involved with withdrawal from school;

counseling students on career prospects and on applications to graduate and professional schools; and advising on legal matters.

Whatever the question or the problem, the provost and his or her staff stand ready at all times to help undergraduates in need of counsel.

### **Phi Beta Kappa**

Membership in Phi Beta Kappa, the national honors society founded at the College of William and Mary in 1776, is available to qualified UCSD graduates. Membership is conferred for high scholastic standing, and is determined by vote of the chapter according to a student's scholarship records. Specific details regarding membership may be obtained from the provosts' offices.

### **Honors**

Each college awards honors to outstanding students, based on criteria approved by the Academic Senate. Approximately 14 percent of graduating seniors are eligible for college honors. These honors are posted on students' transcripts, and noted on their diplomas. Departmental honors are also awarded by eleven UCSD academic departments, with no more than 20 percent of graduating seniors in those departments eligible. Departments or programs currently approved to award honors are anthropology, biology, Chinese studies, economics, economics (management science), history, linguistics, literature, Muir Special Project, music, philosophy, political science, psychology, and sociology. These honors are posted on students' transcripts, and noted on their diplomas.

For further details, see "Honors" in the Index.

### **Transfer Students**

Students who transfer to one of UCSD's four colleges from other institutions must complete the graduation requirements of the college of their choice. To determine which courses already completed by a student may be applied to his or her graduation requirements, the Office of the Provost will evaluate the student's prior course record at the time of his or her initial enrollment in UCSD. Students may not receive units for courses which duplicate previous credits.



# GRADUATION REQUIREMENTS IN THE UCSD COLLEGES

Unless otherwise indicated, the figures in this chart refer to the number of COURSES rather than to the number of units. Most UCSD courses carry four quarter-units of credit, and a student usually takes four courses each quarter. Subjects are broadly classified as humanities and fine arts, social sciences, and natural sciences. Where a subject is listed here as "noncontiguous," this means that it must be in one of these categories which is different from that of the major. Students must meet the Subject A requirement prior to enrolling in the writing course of their respective college.

## General Education

### REVELLE COLLEGE

**HUMANITIES**  
(Includes two six-unit courses with intensive instruction in university level writing. Written work is also required in the remaining three courses, each four-units) .....5

**PHYSICS AND CHEMISTRY**  
(A total of four courses with at least one course from each area) .....4

**BIOLOGY** .....1

**FOREIGN LANGUAGE**  
(number of courses to attain proficiency) .....0-4

**CALCULUS** .....3

**SOCIAL SCIENCES** .....3  
(Anthropology, Economics, Political Science, Psychology, Sociology)

**FINE ARTS** .....1  
(Art, Music, Theatre)

### MUIR COLLEGE

**WRITING** .....2-3

**A THREE-COURSE SEQUENCE** .....6  
in each of TWO of the following categories:

**HUMANITIES**  
**FINE ARTS**  
**FOREIGN LANGUAGE**

**AND**

**A THREE-COURSE SEQUENCE** .....6  
In **SOCIAL SCIENCE** and another three-course sequence in either **MATHEMATICAL SCIENCE** or **NATURAL SCIENCE**

### THIRD COLLEGE

**WRITING** .....2

**BIOLOGY** .....1  
**CHEMISTRY** .....1  
**PHYSICS** .....1

**OPERATIVE LOGIC** .....2  
One Introduction to Computing course, and one course in either math or statistics

**SOCIETAL ANALYSIS** .....3  
One course each from three of four areas listed:

Communication  
Third World Studies-History/  
Social Sciences  
Third World Studies-Literature  
Urban Studies & Planning

**Writing Adjunct:**  
Freshmen must complete two writing adjuncts associated with the social analysis requirement listed above. Transfer students must complete one.

**A THREE-COURSE SEQUENCE** .....3  
In humanities, foreign language, or fine arts.

**NONCONTIGUOUS UPPER-DIVISION REQUIREMENT** .....3  
Three courses noncontiguous to the major; at least one course must focus on a society or culture other than one's own.

### WARREN COLLEGE

**WRITING** .....2

**ETHICS and SOCIETY** .....1

**FORMAL SKILLS** .....2

Two Courses in Calculus  
OR  
Two in Symbolic Logic  
OR  
Two in Computer Science  
OR

One in Computer Science and one in Symbolic Logic

**PROGRAMS OF CONCENTRATION**  
(for B.A./B.S. degrees in arts/sciences) .....12

Two programs (minors) each typically consisting of three lower-division and three upper-division courses. Both programs must be noncontiguous to the major and to each other.

**AREA STUDIES**  
(for B.S. degrees in engineering) .....6  
Two area studies each consisting of three courses. Both area studies must be noncontiguous to the major and to each other.

## Minor

One Required. Six courses focused in one noncontiguous subject area OR any six noncontiguous courses. At least three of these courses must be upper-division.

OPTIONAL

OPTIONAL

See "PROGRAMS OF CONCENTRATION" and "AREA STUDIES" in General Education section above.

## Major

Majors are identical regardless of the student's chosen college. Most majors require twelve to eighteen upper-division courses, based upon adequate lower-division preparation; such preparation may be part of the general education requirements. Majors in certain engineering programs may require as many as twenty-two upper-division courses.

### TOTAL NUMBER OF COURSES REQUIRED FOR GRADUATION

B.A. Degrees: 46 courses (184 units)

B.S. Degrees: 48 courses (192 units) minimum

B.A. Degrees: 45 courses (180 units). At least 18 courses must be upper-division

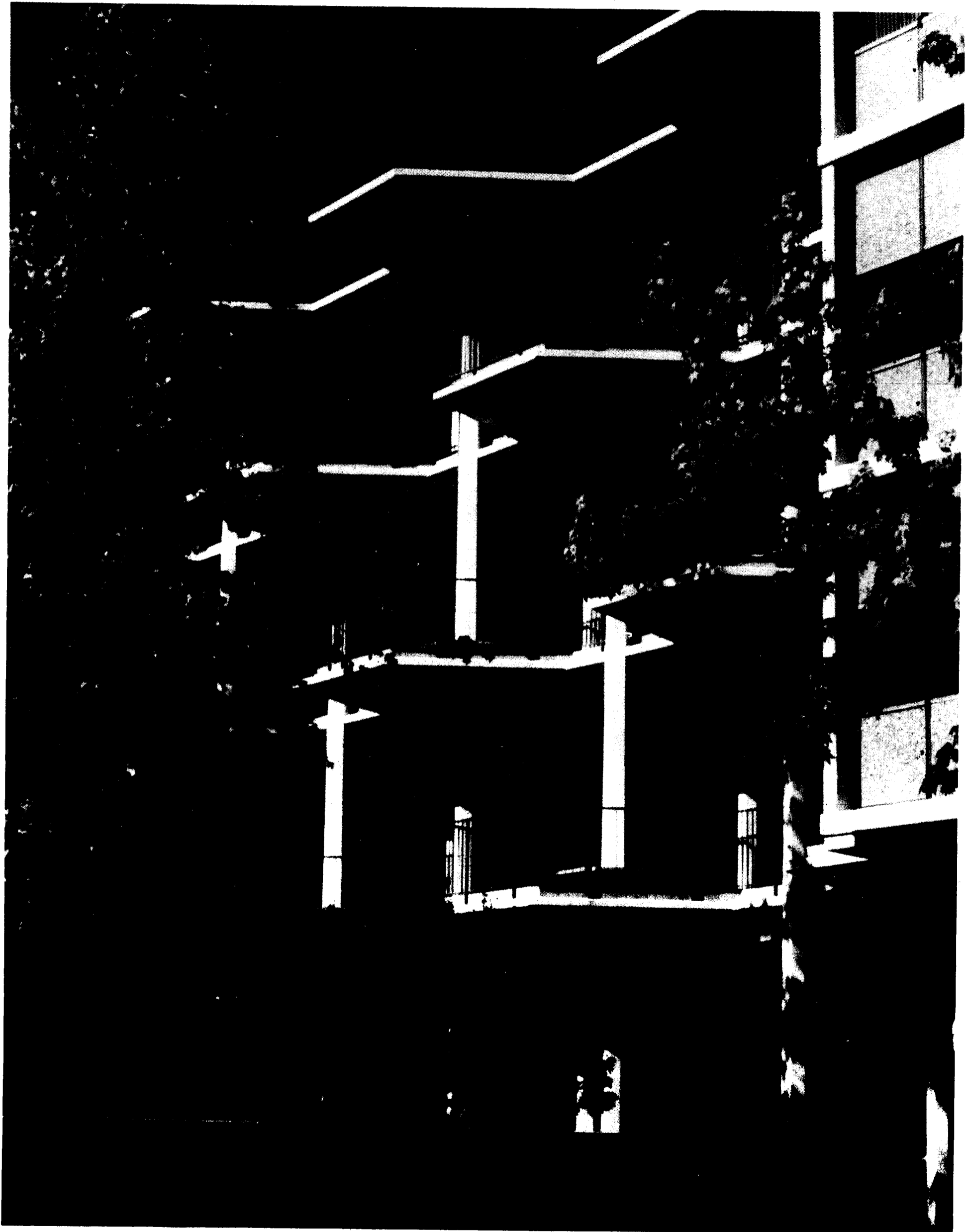
B.S. Degrees: At least 72 units of the 192 units total must be upper-division.

B.A. Degrees: 45 courses (180 units). At least 18 courses must be upper-division.

B.S. Degrees: 192 units, at least 72 of which must be upper-division.

B.A./B.S. Degrees in arts/science: 45 courses (180 units). At least 60 units (15 courses) must be upper-division.

B.S. Degrees in engineering: At least 72 units of the 192 units total must be at the upper-division level.



# REVELLE COLLEGE

Revelle College, the first college on the UCSD campus, was named in honor of Dr. Roger Revelle, former university-wide dean of research, and for many years director of UCSD's Scripps Institution of Oceanography.

Formerly called the School of Science and Engineering and later First College, Revelle College was established in 1958. After being temporarily housed on the Scripps campus, Revelle moved into its first complete buildings during the 1963-64 academic year. In 1960 Revelle began a graduate program in the physical sciences. From that beginning, it rapidly developed its humanities and social science programs, and today the teaching program reflects a broad spectrum of learning.

With the establishment of Revelle College, the faculty was given a rare opportunity to shape an undergraduate curriculum that would, insofar as any educational program can, prepare its students for the modern world. From the outset of planning the curriculum, the faculty asked: What sort of knowledge must students have if they are to be liberally educated? In what areas? To what depth? How specialized must that education be in the undergraduate years?

The educational philosophy of Revelle College was developed in response to such fundamental questions. Its undergraduate program is based on the assumption that students who are granted the bachelor's degree will have attained:

1. An acceptable level of general education in mathematics, foreign language, the physical, biological, and social sciences, the fine arts, and the humanities.
2. Preprofessional competence in one academic discipline.
3. An understanding of an academic area outside their major field.

To this end, a lower-division curriculum has been established which should enable students to acquire an understanding of the fundamental problems, methods, and powers of the humanities and

the arts, the social and behavioral sciences, mathematics, and the natural sciences.

The lower-division curriculum assumes that undergraduates should not concentrate heavily in a special field until they have had a chance to learn something about the various fields that are open to them. Their general education must, then, be thorough enough for them to see the possibilities in those fields. Early in their careers, they should know three languages: their own, a foreign language, and the universal language of mathematics. They will study a foreign language as a spoken, vital means of communication; studying that language, they will come to know something of the general nature of language itself. And they will study mathematics as part of general education and as preparation for required courses in the physical and biological sciences. They will learn more about their own culture in a two-year program of study in the humanities and fine arts, which requires the regular writing of essays. Finally, they will, as sophomores, study the social and behavioral sciences. Once they have completed this program, they will be ready for the relatively more specialized work of the upper division.

During the students' junior and senior years, their main efforts will be devoted to intensive work in their major fields at a level of competence that will enable them to continue their study at the graduate level.

The students' general education will not, however, stop at the end of the sophomore year; in addition to their majors, all upper-division students will do substantial work in an area or areas of learning distinctly different in content and method from that of the major. (Generally, the following will be considered "areas of learning" in the above sense: mathematics and natural sciences, the social sciences, humanities.)

Revelle College stresses the broad character of its curriculum. Every student, for example, is required to achieve a certain competence in calculus. The emphasis on calculus and physical sci-

ence is in some respects a deviation from educational theory of the last hundred years. The older "general-education" theory demanded that scientists achieve a reasonable competence in the social sciences and humanities. The rising importance of science and technology justifies the application of the theory to nonscientists as well.

Four years of college can at best yield only a limited knowledge; the major task is to train students so that they can adapt quickly and effectively to the rapidly changing world.

## General-Education Requirements

Students are encouraged to meet the general-education requirements and the prerequisites to the major as rapidly as possible. Variations within the program will occur, of course, depending on the student's interest, prior training, and ability to make use of individual study. Those who demonstrate superior achievement and competence in an academic area may take advanced courses and individual study programs.

In order to fulfill the requirements in the principal fields of knowledge, the student takes a recommended set of courses, the prerequisites for which have been met by the general admission standards of the university.

The general-education requirements are:

1. Satisfaction of the general University of California requirements in Subject A and American History and Institutions.
2. A five-course sequence in an interdisciplinary humanities program including two six-unit courses with intensive instruction in university-level writing. Written work is also required in the remaining (four-unit) three-quarter courses.
3. One course in the fine arts.
4. Three lower-division courses in the social sciences, at least two of which must be in one social science department (to be selected from an approved list).

5. Three courses in mathematics (three quarters of calculus).
6. Five courses in the physical and biological sciences to include four quarters of physics and chemistry and one quarter of biology.
7. Basic conversational and reading proficiency in a modern foreign language or advanced reading proficiency in a classical language.

**1. Subject A and American History and Institutions**

Satisfaction of the university requirements in Subject A and American History and Institutions. (See "Undergraduate Registration" and "Academic Regulations," "Humanities," and "Undergraduate Admissions, Policies and Procedures: American History and Institutions.")

**2. Humanities**

The purposes of the general-education requirement in humanities are two-fold: (a) to confront students with significant humanistic issues in the context of a rigorous course which can serve as an introduction to the academic disciplines of history, literature, and philosophy; (b) to provide training and practice in rhetorical skills, especially persuasive written expression.

Students may meet this requirement by satisfactorily completing five courses of the interdisciplinary humanities program offered by the Departments of History, Literature and Philosophy, which focus on some of the great documents of civilization. The sequence of courses, Humanities 1 through 5, is designed to meet the humanities and writing requirement of Revelle College. (Students must have satisfied the university's Subject A requirement before registering for this sequence.)

In connection with learning about the Western tradition, students in Humanities 1 and 2 (six units each) will receive intensive instruction in university-level writing. Instruction in writing is provided in discussion sections, and frequent writing exercises are required. Written work is also required in the remaining three quarters of the sequence (Humanities 3-4-5, four units each).

For course descriptions, see "Courses, Curricula, and Programs of Instruction: Humanities."

**3. Fine Arts**

One course is required to provide an introduction to the fundamental experience in the interpretation of creativity in theatre, music, or visual arts. (See "Courses, Curricula, and Programs of Instruction: Theatre, Music, and Visual Arts.")

**4. Social Sciences**

Three lower-division courses in the social sciences are required. Students will choose three lower-division courses from an approved list of offerings from the Departments of Anthropology, Economics, Linguistics, Political Science, Psychology and Sociology, or from an interdisciplinary social science sequence. At least two of the courses must be in one social science department or sequence.

**5. Mathematics**

Mathematics has for centuries held an important place in education, in the sciences, and in the humanities. As an integral part of their liberal education, students will be brought into contact with a significant area of mathematics. Furthermore, they will gain the facility to apply mathematics in their studies of the physical, biological, and behavioral sciences.

There are two beginning-year sequences which meet the Revelle College mathematics requirement. Both sequences include integral and differential calculus. Freshman placement in these sequences is dependent upon the student's high school or college preparation in mathematics (as evidenced by a placement examination) as well as future plans. Students are urged to keep their mathematical skills at a high level by taking mathematics during their junior and senior years in high school. Students who have completed college courses in calculus or who present advanced-placement credit in mathematics may not receive credit for mathematics courses which duplicate their advanced-standing work; however, they will be encouraged to further their study of higher mathematics. (See "Courses, Curricula, and Programs of Instruction: Mathematics.")

**FRESHMAN YEAR**

**Fall**

- Foreign Language
- Mathematics
- Natural Science
- Subject A or Fine Arts

**Winter**

- Humanities 1
- Foreign Language
- Mathematics
- Natural Science

**Spring**

- Humanities 2
- Foreign Language
- Mathematics
- Natural Science

**SOPHOMORE YEAR**

**Fall**

- Natural Science
- Social Science
- Humanities 3
- Foreign Language

**Winter**

- Natural Science
- Social Science
- Humanities 4
- Elective

**Spring**

- Fine Arts or elective
- Social Science
- Humanities 5
- Elective

\* Science majors may want to take part of the social science requirement in the junior year to allow time for additional science laboratories and/or mathematics

## 6. Natural Sciences

The natural science courses, including the physical and biological sciences, present the fundamental concepts of modern physics, chemistry, and biology. For the student who may major in one of these disciplines, the courses provide a background and preparation for further study; for those students who will continue their studies outside the natural sciences, they offer an opportunity to gain a certain understanding and appreciation of current developments in these fields.

Students choose their five required physical and biological science courses from the following sequences depending upon their interests, prior preparation, and intended majors. The Department of Chemistry offers Chemistry 5A-B, Chemistry 6A-B-C, and Chemistry 7A-B. The Department of Physics offers three calculus-based courses: Physics 1A-B-C, Physics 2A-B-C-D, and Physics 3A-B-C-D. The Department of Biology offers Biology 1, 3, or 11 to meet the Revelle biology requirement. (See "Chemistry," "Physics," and "Biology" in the "Courses, Curricula, and Programs of Instruction" section of this catalog.)

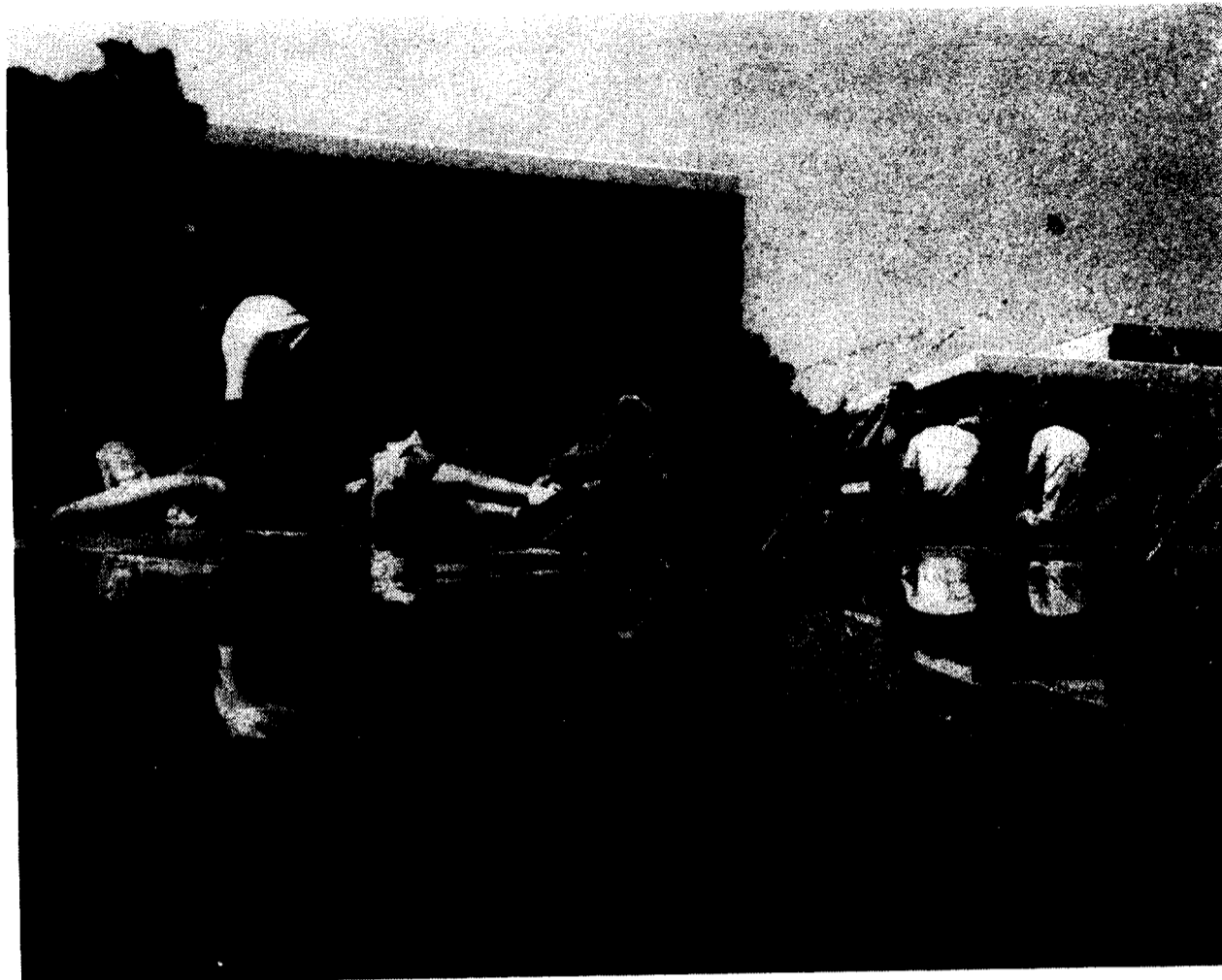
*Students planning to major in a science must consult the appropriate departmental listing under "Courses, Curricula, and Programs of Instruction" to find the additional preparation needed for their major.*

## 7. Foreign Language

Revelle College students are required to demonstrate basic conversational and reading proficiency in any modern foreign language, or advanced reading proficiency in a classical language.

Modern foreign language programs are currently offered in Chinese, French, German, Hebrew, Italian, Russian and Spanish, and classical language programs are offered in Greek, Latin, and Hebrew. Students who have preparation in other languages should see the Office of the Revelle Provost to arrange a proficiency examination. This exam may also be taken by native speakers of any foreign language without further course study.

The language requirement is normally satisfied well before the end of the student's second year at Revelle College. About a quarter of the students entering,



after three or four years of a language in high school, satisfy the requirement by examination upon entrance. The option of satisfying the language requirement by examination is also available at the end of the third quarter of college-level language study for students who wish to take it. A language studied in high school for two or more years may be continued by taking Linguistics 32/52 and 33/53, and 34/54 or Literature 10, and by passing Literature 10 or both Linguistics 34 and 54 with a grade of C – or better. Or a student may choose to begin the study of a new language and satisfy the requirement by taking Linguistics 31/51, 32/52, 33/53, and Literature 10, and passing Literature 10 with a grade of C – or better. Or a student may satisfy the requirement by passing (with a grade of C – or better) the fourth quarter of any modern or classical language course at UCSD. For any language, the fourth-quarter course must be taken at UCSD in order to satisfy the language requirement.

## The Major

All undergraduate majors offered at UCSD are available to Revelle College students. An exceptional student who has some unusual but definite academic interest for which a suitable major is not offered on the San Diego campus may, with the consent of the provost of the

college and with the assistance of a faculty adviser, plan his or her own major. The Revelle Individual Major must be submitted no later than three quarters before the student's intended graduation and be approved by the Executive Committee of the college before it may be accepted in lieu of a departmental or interdepartmental major. The faculty adviser will supervise the student's work, and the provost must certify that the student has completed the requirements of the individual major before the degree is granted.

Students who fail to attain a grade-point average of at least 2.0 in work taken in the prerequisites for the major, or in the courses in the major, may, at the option of the department, be denied the privilege of entering or of continuing in that major. Students majoring in AMES, CSE, ECE communication, math/computer science, or psychology/cognitive science need to be aware of additional screening for acceptance into the major.

## Noncontiguous Minor

In addition to the major and the general-education requirements, Revelle College students are required to complete six courses in an area of studies *other than* that of the major. For the purposes of this requirement, the humanities, the social sciences, and the natural sciences (including mathematics) will be considered three different areas. At least three of the six courses must be at the upper-division level. It will be the student's responsibility to obtain assurance from the Office of the Revelle Provost that the courses which the student has chosen are noncontiguous. During the junior year a student must specify how he or she will satisfy the minor requirement. (Forms are at the Office of the Revelle Provost.) Minor programs are subject to approval by the provost. The requirement may be met in one of the following ways:

- a. *Department Minor* — All six noncontiguous courses for the minor are taken in one department, and they are chosen with the advice and approval of a minor adviser in that department.
- b. *Project Minor* — A project minor centers on a topic or period chosen by the student. The project is often interdepartmental and interdisciplinary. The program must have the approval of a minor adviser in the "center-of-gravity" department, who will also be available to assist the student in planning the program for the minor. (Students unable to locate an appropriate faculty adviser should ask the Office of the Revelle Provost for assistance.)
- c. *Six Electives Unrelated to the Major* — Under this option, a student is free to elect any six courses for which he or she is qualified, subject only to the constraints that at least three courses be at the upper-division level and that all six courses are noncontiguous to the student's major.

## Pass/Not Pass Grading Option

1. No more than one-fourth of an undergraduate student's total course units taken at UCSD and counted in satisfaction of degree requirements may be graded on a Pass/Not Pass basis.
2. Courses used to satisfy the noncontiguous minor may be taken on a Pass/Not Pass basis.
3. Courses taken as electives may be taken on a Pass/Not Pass basis.
4. Courses taken Pass/Not Pass may not be used in satisfaction of any lower-division Revelle College breadth requirements except fine arts and language.
5. Upper-division courses to be counted toward a departmental major may not be taken on a Pass/Not Pass basis. Individual departments and/or advisers may authorize exceptions to this regulation.

## The Graduation Requirements

In order to graduate from Revelle College, a student must:

1. Satisfy the University of California requirements in Subject A and American History and Institutions.
2. Satisfy the general-education requirements.
3. Successfully complete a major consisting of at least twelve upper-division courses as stipulated by the department.
4. Complete six noncontiguous courses (at least three must be upper-division).
5. Pass at least 184 units for the B.A. or 192 quarter-units for the B.S. in engineering. The requirements of some engineering majors and the college exceed 192 units. In such cases, even a student who completes 16 units per quarter may not be able to graduate in four years. No more than 3.0 units of physical education, whether earned at UCSD or transferred from another institution, may be counted towards graduation.

6. Attain a C average (2.0) or better in all work attempted at the University of California (exclusive of University Extension). Departments may require a C average in all upper-division courses used for the major or C grades in each course used for the major.
7. Meet the senior residence requirement. (See "Academic Regulations: Senior Residence.")

Upon satisfaction of the graduation requirements, Revelle College will recommend that the student be awarded the bachelor of arts degree or the bachelor of science degree in designated engineering programs.

## Honors

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta Kappa honors are awarded. An honors banquet is given for the top one hundred students in Revelle each spring. Seniors are selected for participation in honors seminars and may be selected to be an honor student mentor for a sophomore. For additional information, see "Revelle Honors Program" and "Honors" in the index.



# JOHN MUIR COLLEGE

John Muir College admitted its first students in the fall of 1967 and moved to its present quarters in 1970. The college was named for John Muir (1838-1914), a Scottish immigrant who became a famous Californian naturalist, conservationist, and author. Muir explored the Sierra Nevada and Alaska, and worked for many years for the cause of conservation and the establishment of national parks and forests.

## The Character of the College

Naming a college affirms certain ideas and values. John Muir was committed to learning, self-sufficiency, and the betterment of mankind. Throughout his life he was open to new ideas and experiences which he shared with others through his many books. In keeping with his example, the college has, through its interdisciplinary studies programs, developed courses on such topics as "The Wilderness and Human Values" and "Living and Learning in a Modern University." It has established an individualized major called the Muir Special Project. And it has inaugurated an exchange program with Dartmouth College, one of the most distinguished undergraduate institutions in the United States. Each quarter fifteen UCSD students, the majority of them from Muir, attend Dartmouth, while a similar number come from Dartmouth to Muir. By these and other means, the college maintains at UCSD the heritage of the remarkable man for whom it was named.

## The General-Education Requirements

The general-education program was established by the faculty of John Muir College to guide students toward a broad and liberal education while allowing them substantial choice in the development of that education. Students must select year-long sequences (three courses in the same department) from four different academic areas. One of the sequences must be from the social sciences area, the second from the natural sciences or mathematics (calculus), and the remaining two sequences from the humanities, fine arts,

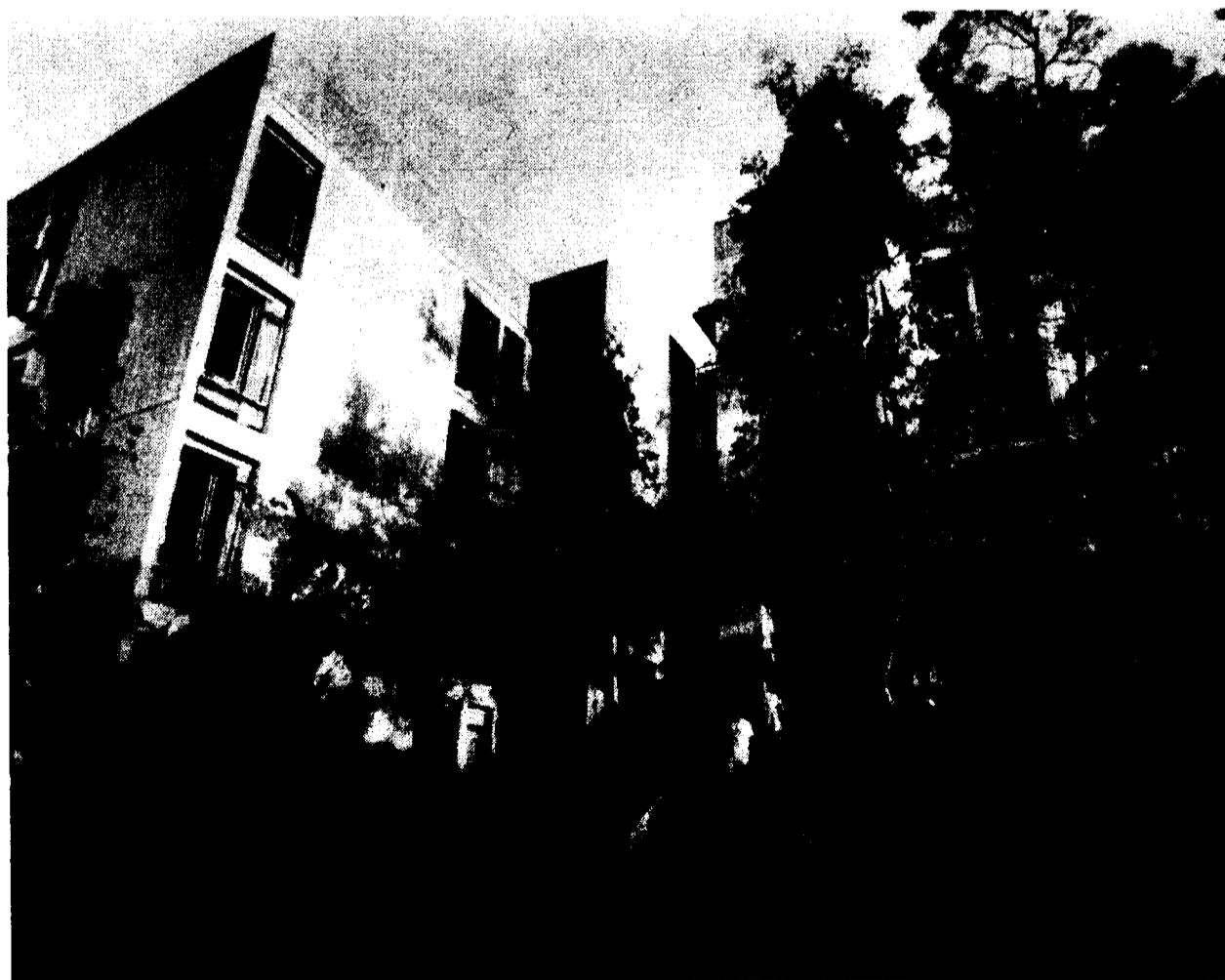
or foreign languages. Students choose sequences from several alternatives. It should be understood that this freedom carries with it certain responsibilities on the part of the student for careful planning. Some of these are:

1. Students should request from the advising unit of the Office of the Provost a list of general-education requirements before making their final selection of courses.
2. Only complete sequences may be applied to the general-education requirement. Ordinarily an entire sequence from one department is taken in one academic year.
3. Courses taken to satisfy the general-education requirements may, in general, be taken for a letter grade or Pass/Not Pass.
4. Units obtained from advanced placement may be applied toward the 180 units needed for graduation; such units may be used to fulfill partially the general-education requirements.

For students who transfer to Muir College from another institution, the general-education requirements will be interpreted in this way: two semester-courses or three quarter-courses in one subject represented on the approved list normally will be accepted as completing one of the four required sequences. After the Office of Admissions evaluates a student's transcript, the advising unit of the Office of the Provost makes an evaluation of prior work for each student at the time of his or her first enrollment.

## Pass/Not Pass Grading Option

Muir students are reminded that to take a course Pass/Not Pass, they must be in good standing (2.0 G.P.A.). No more than one-fourth of an undergraduate student's total UCSD course units counted in satisfaction of degree requirements may be in courses taken on a Pass/Not Pass basis (including P.E. courses). A *maximum of three units of physical education credit may be applied to the B.A. or B.S. degree.*



## Major Programs and Special Projects

Almost all of the major programs at UCSD have a pattern of prerequisites, some of them quite extensive. Students who do not plan well could find, in their junior year, that they have access to few majors without doing additional lower-division work. With careful planning, they may have access to a wide range of majors. Muir College students are encouraged to consult regularly with the academic advisers of the Office of the Provost as well as with members of the faculty concerning the selection of appropriate courses.

Each academic department has, in its section of this catalog, a paragraph entitled "The Major Program." Students are encouraged to read these sections carefully, for they indicate both the extent and the nature of the upper-division program. The following points are useful to keep in mind:

1. A substantial command of at least one foreign language is required by some departments (e.g., linguistics, literature).
2. Specific science courses are required by many departments. For example, the Department of Computer Science and Engineering and the Department of Electrical and Computer Engineering often require Physics 2A-B-C-D or Physics 3A-B-C-D; the Department of Chemistry requires Physics 1A-B-C, Physics 2A-B-D, or Physics 3A-B-C-D.
3. The physical and life sciences, applied sciences (the Departments of Computer Science and Engineering, Electrical and Computer Engineering, and Applied Mechanics and Engineering Sciences) together with certain social sciences (including economics), require at least one year of calculus.

The Muir Special Project major is intended for students who have specific talents and interests which are not accommodated by one of the departmental majors. The project major normally includes both regular course work, independent study, and a project or senior thesis as well as a recommended back-up major. Taken together, the project major must represent a minimum of fifteen four-unit upper-division courses. The project may be one of two kinds: creative work of some sort (e.g., a book of poetry, a collection of musical compositions), or a de-



tailed program of study and research in a particular area. The latter results in a long paper representing a synthesis of knowledge and skill acquired. In either case, a regular member of the faculty must serve as an adviser to a student doing the project. It should be understood that the demands of a special project major are great, and a project is not appropriate for a student who simply does not want the discipline of a normal major. For a course to be included as part of a Muir Special Project, the student must earn in it a grade of C – or better. Further information may be obtained from the advising unit of the Office of the Provost.



## Graduation Requirements

To receive a degree of bachelor of arts or bachelor of science (the latter offered in some engineering majors and physics), a John Muir College student must:

1. Make an appointment with the academic advising office (534-3580) for a final degree check. This must be done by Friday of the second week of the quarter in which the student files to graduate. Students graduating at the end of a summer session must make an appointment by the second week of Summer Session.
2. Meet the general university requirement in Subject A, English Composition. (See "Undergraduate Admissions, Policies and Procedures.")
3. Satisfy the University of California requirement in American History and Institutions (See "Undergraduate Admissions, Policies and Procedures.")
4. Meet the Muir College requirement in writing proficiency. This requirement asks that the student demonstrate an ability to write English according to standards appropriate for all college work. (See Muir College course listings: "The Writing Program.")
5. Fulfill the general-education requirements.
6. Pass forty-five, four-unit (180 units) academic courses or their equivalent. *Eighteen of the forty-five courses (72 units) must be upper-division level.* Students with majors granting B.S. degrees, with the exception of physics, may need more than eighteen upper-division courses and must have at least 192 units. Departments may require a C average in all upper-division courses and/or a grade of C- or better in courses required for the major.
7. Show some form of concentration and focus of study. Ordinarily this is accomplished by completing a department major. Students in the college may attempt any major upon completion of the prerequisites. (Presently, the Departments of AMES, CSE, ECE, Communication, Visual Arts-media, and Mathematics-computer science require students to attain a minimum G.P.A. in prerequi-

site courses and apply for admission to majors in the departments.) Students who do not choose to meet this requirement by means of a departmental or interdisciplinary major must complete a special project major. As the name implies, this is a specialized form of concentration. It normally consists of a combination of regular course work, independent study, and a project. Each project must be approved by the provost. (See the section, "Major Programs and Special Projects," above.)

8. Satisfy the residency requirement which stipulates that nine of the last eleven courses passed be taken at UCSD as a registered Muir College student. Students planning to study abroad during the senior year should be aware that they must return to complete a minimum number of twenty-four units at UCSD. Such students should see their college adviser for clarification.
9. A grade-point average of at least 2.0 in the major *and* overall is required. Departments may require a C average in all upper-division courses used for the major or C- grades in each course used for the major. Students on "probation" or "subject to dismissal" in their last quarter will not be eligible for graduation.
10. *Students may not graduate with "NRs", "IPs", or "Incomplete" entries on their transcript.* Therefore, they should be sure that all Incompletes have been made up and final grades have been properly recorded by the end of the quarter in which they plan to graduate.
11. All requirements for the degree are to be completed during the quarter in which students file to graduate. If the degree requirements are completed after the expiration of the deadline in a quarter, but before the beginning of the next quarter, students must refile to graduate for the subsequent quarter. Degrees are not automatically granted; students must file their intention to graduate.
12. *If students are unable to satisfy all graduation requirements, including grade changes, by the end of the quarter, they must refile the Degree and Diploma Application form to graduate in the quarter in which the deficiencies will be satisfied.*

13. It is the students' responsibility to contact their department adviser to verify that they have satisfied departmental requirements for graduation.

While John Muir College does not call for the completion of a minor to fulfill its requirements for the degree of bachelor of arts or bachelor of science, it does acknowledge such completion of an approved departmental minor on a student's transcript. **No upper-division courses may be used to satisfy both a major and a minor.** At least three of the six courses must be upper-division. Only one of the lower-division classes may be taken P/NP, and only one upper-division class may be taken P/NP. (A 199 course can only be taken P/NP.)

Upon satisfaction of the graduation requirements, Muir College will recommend that the students be awarded the degree of bachelor of arts (180 units, of which 72 must be upper-division) or bachelor of science (offered only in some engineering majors, requiring 192 units of which at least 72 units must be upper-division and physics, which requires 180 units of which at least 72 units must be upper-division).

## Honors

Quarterly provost's honors, departmental honors, college honors membership in the Caledonian Society of John Muir College, and Phi Beta Kappa honors are awarded. Please note that graduating seniors must have letter grades for eighty units of work completed at the University of California for college honors. For additional information, see "Honors" in the Index.

## Honorary Fellows of Muir College

Hannes Alfvén, Scientist and Nobel laureate

†Georg von Bekesy, Psychologist and Nobel laureate

Oscar (Budd) Boetticher, Filmmaker  
David Brower, Conservationist

Francis H.C. Crick, Scientist and Nobel laureate

Ernst Krenek, Composer

†Ernest Mandeville, Philanthropist  
William J. McGill, Educator

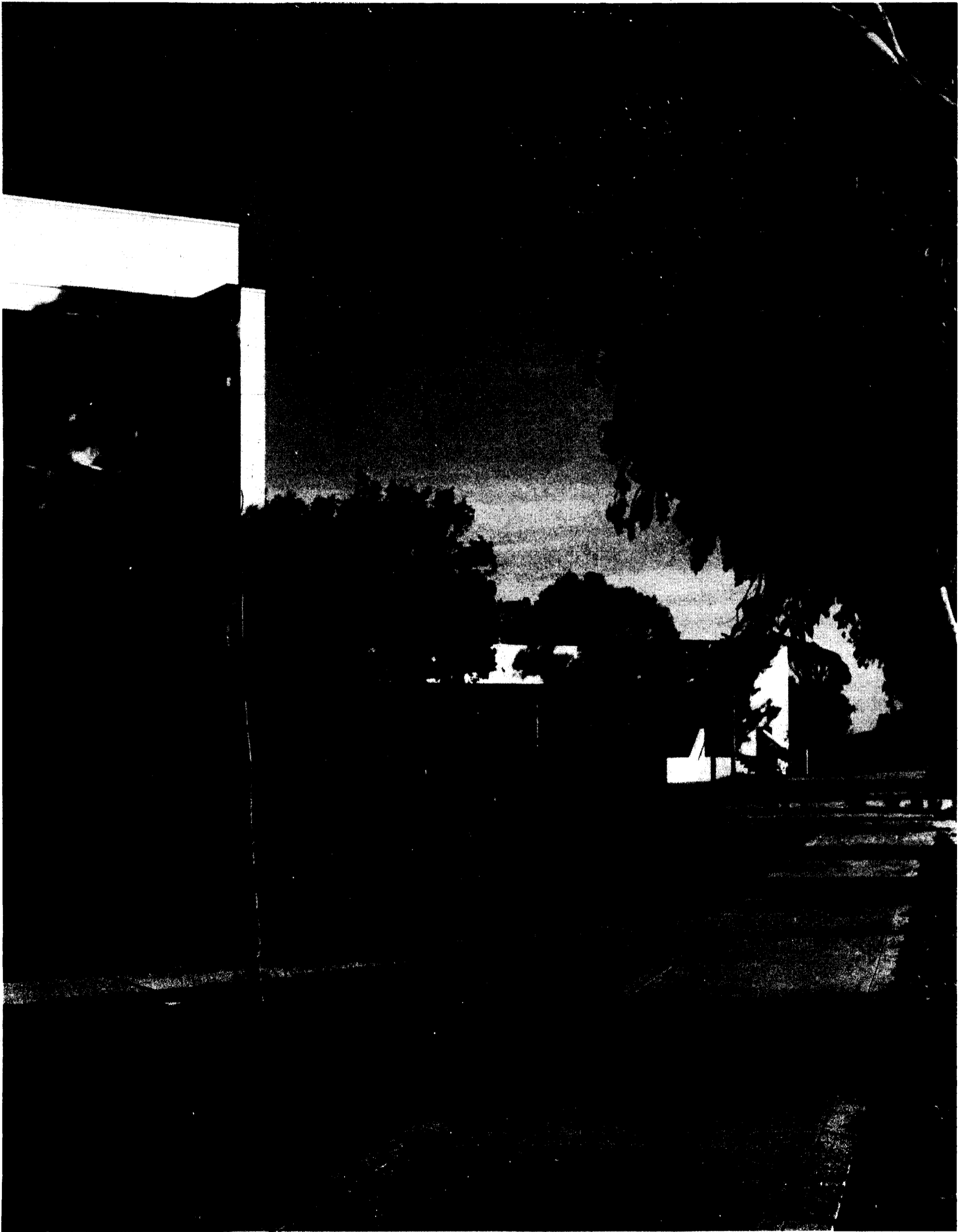
Jonas Salk, Scientist

Claude E. Shannon, Mathematician

†Earl Warren, Jurist and Statesman

Robert Penn Warren, Poet and Novelist

†Deceased



# THIRD COLLEGE

Third College enrolled its first students in the fall of 1970. Because Third College is guided by the belief that education should not be divorced from the social imperatives of our time, it has a distinctive academic focus of understanding the diverse elements which effect societal change and the development and alleviation of contemporary social problems. Third College is committed to the scholarly investigation and understanding of those factors which determine the quality of life in urban and rural settings in Western and non-Western countries, whether these factors be technological, political, economic, or cultural. Third College provides leadership, and remains on the cutting edge of academic innovation. Such academic programs cut across traditional disciplinary lines to reflect new social and technological realities which affect social change. These departments and programs include: Communication, Urban Studies and Planning, Third World Studies, Contemporary Black Arts, and the Teacher Education Program.

Third College students pursue majors in mathematics, engineering, natural and biological sciences, the social sciences, the humanities, and fine arts. It is the primary aim of Third College to prepare its students for the pursuit of a rigorous academic curriculum, and to promote entry into graduate/professional programs, or the careers of their choice. The college is equally committed to educating students in such ways that, as thinking, socially aware adults, they will become community members and citizens who are sensitive to understanding the diversity of our cultural heritage. From its inception, Third College has been dedicated to the establishment of a multicultural and socially aware academic community.

The Third College educational philosophy is founded on the belief that the best preparation for a complex, independent, and rapidly changing world is a broad liberal arts education, complemented by in-depth study in the areas of the students' choice based upon individual

interests and career goals. This educational approach has several major advantages for students:

1. It guarantees a basic understanding of the principal branches of knowledge: the humanities and arts, social sciences and the natural sciences and mathematics.
2. It provides the flexibility to enable students who have well-defined major interests and career goals to begin work on their majors as freshmen.
3. It provides a structure to guide students who have not decided on a major to sample an array of potential majors while simultaneously satisfying the general-education requirements of the college.

This educational philosophy finds further expression in our collegiate advising and counseling systems which are designed to enable students to derive full benefit from the rich and diversified academic programs at UCSD.

To meet a broad array of student goals, Third College has encouraged and developed academic programs for students who wish to prepare for either graduate and professional schools or employment upon graduation. In terms of the latter, Third College initiated the Teacher Education Program and has pioneered field placement and internship programs to provide students opportunities to apply their knowledge to real world situations. In addition, Third College sponsors a number of activities which direct the intellectual resources of the university to matters of public importance and interest.

It is fundamental to the philosophy of Third College that students, faculty, and staff constitute an intellectual community joined in the task of mutual learning. This aspect of the Third College philosophy is reflected in the participation of students in faculty research projects, acquisition of a major grant to support minority students in biomedical research by the science faculty, and the close working relationships of faculty, students, and administration in collegiate governance.

## General-Education Requirements

General-education requirements are established by the Third College faculty. These requirements are designed to introduce students to the academic focus of Third College, provide a broad liberal arts and science background, and furnish students with the academic skills and the basic knowledge necessary to pursue any departmental or interdisciplinary major.

The general-education requirements are as follows:

1. **WRITING:** A two-course sequence in writing.
2. **SOCIETAL ANALYSIS:** Three courses. One course each from three of the four areas listed:
  1. Communication
  2. Third World Studies — History and Social Science.
  3. Third World Studies — Literature
  4. Urban Studies & Planning.In addition, all entering freshmen must complete two writing adjuncts associated with the societal analysis courses. Transfer students must complete at least one writing adjunct.
3. **NATURAL SCIENCE:** Three courses. One course each in the following areas:
  1. Biology
  2. Chemistry
  3. Physics
4. **OPERATIVE LOGIC:** Two courses required. One introduction to computing course, and one course in either mathematics (pre-calculus or higher) or statistics.
5. **HUMANITIES, FINE ARTS, OR FOREIGN LANGUAGES:** A *one-year sequence* (excluding studio or performance courses in fine arts).
6. **NONCONTIGUOUS UPPER-DIVISION REQUIREMENT:** Three non-contiguous upper-division courses. At least one course must focus on a culture or society other than one's own.



7. All students are required to complete a minimum of eighteen (four unit) upper-division courses.

The Third College Curriculum and Academic Affairs Committee publishes an annual fact sheet which lists specific courses which may be used to meet these requirements. Contact the college's academic advising office for additional information.

### Graduation Requirements

To receive a bachelor's degree from Third College, a student must:

1. Satisfy the university Subject A requirement. (See "Undergraduate Admissions, Policies and Procedures.")
2. Satisfy the university requirement in American History and Institutions. (See "Undergraduate Admissions, Policies and Procedures.")
3. Fulfill the general-education requirements as described.
4. Complete a departmental or interdisciplinary major.
5. Satisfy the college residency requirement that nine of the last eleven courses must be completed as a registered Third College student.

6. Complete a minimum of forty-five courses (180 quarter units), for the B.A. degree and forty-eight courses (192 quarter units) for the B.S. degree. All students must complete a minimum of eighteen four-unit upper-division courses. A "C" average or higher is required.

### Majors and Minors

**Majors:** Third College students may pursue any of the departmental or interdisciplinary majors offered at UCSD. The majority of the academic departments have established lower-division prerequisites. Generally, these prerequisites must be completed prior to entry into upper-division major courses. Students are strongly encouraged to work closely with department faculty advisers and college counselors. Students must maintain a minimum grade-point average of 2.0. For details on the specific major departments, refer to the "Courses, Curricula, and Programs of Instruction" section of this catalog.

**Minors** are optional at Third College. However, students are encouraged to keep as many options open as possible. A minor provides an excellent opportunity to broaden, enhance, and/or complement the major field of study. A minor consists of six courses or twenty-four units of inter-related course work. A minimum of three upper-division courses must be completed. These upper-division courses

must be taken on a letter grade basis. The upper-division courses may not overlap with the major. The department or program may establish more stringent criteria than the minimum established by the college. A formal request for the minor must be approved by the end of the junior year. The petitions are available in the academic advising office.

### Pass/Not Pass Grading Option

1. Courses to be counted toward a departmental major or as prerequisites to the major must be taken on a letter-grade basis, not Pass/Not Pass.
2. Upper-division courses to be counted toward a minor must be taken on a letter-grade basis, not Pass/Not Pass.
3. Courses taken toward completion of the Third College general-education requirements may be taken on a Pass/Not Pass basis, while at the same time the restrictions for prerequisites to majors and courses counted toward a minor must be observed.
4. Courses taken as electives may be taken on a Pass/Not Pass basis, while at the same time the restrictions on the majors and minors must be observed.
5. No more than one-fourth of the total University of California, San Diego units may be completed on a Pass/Not Pass basis, including physical education courses.

### Honors

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta Kappa are awarded to Third College students. For additional information see "Honors" in the Index or consult with the Academic Honors Program adviser, in the academic advising office.

### Honorary Fellow of the College

Ernesto Galarza, Novelist and Educator

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## EARL WARREN COLLEGE

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Earl Warren College opened in the fall of 1974, and currently enrolls 3,000 students. The college is named after Earl Warren, former chief justice of the United States Supreme Court and the only three-time governor of California. Mr. Warren, a native Californian, earned his college and law school degrees at the University of California (B.L. 1912; J.D. 1914). During his governorship, he was an ex-officio member of the UC Board of Regents for eleven years. Mr. Warren also saw public service as district attorney of Alameda County, and as attorney general of California.

As governor during an era of lightning growth for California, he developed the State Department of Mental Hygiene, and led in reforms of the prison system in California by establishing the Board of Corrections and the Prisoner Rehabilitation Act. In his final role as a public servant, Mr. Warren was chief justice of the United States Supreme Court, which under his leadership elaborated a doctrine of fairness in such areas as criminal justice, voting rights, legislative districting, employment, housing, transportation, and education.

Earl Warren College is committed to preparing its students for an active role in society in their postbaccalaureate years. Whether students wish to continue their education in graduate or professional school, to seek an immediate career or to pursue other options, the college stands ready to assist. Students are encouraged to identify their abilities and interests, examine career possibilities, and prepare for the future.

The college's students and faculty represent all disciplines offered at UCSD. Graduation requirements, which consist predominantly of one major and two secondary areas of study, enable a student to develop a program of study covering a wide range of material while also focusing on particular areas in depth. The diversity of its academic program has made Warren College an exciting home for students who seek maximum flexibility in designing their own education.



## General-Education Requirements

The faculty of Warren has established a minimum number of explicit course requirements for students of the college. This policy stems from a firm conviction that each student should have the opportunity to develop a program best suited to his or her individual interests, but within a framework that ensures both depth and breadth of study. All students are required to have a significant exposure to the humanities and fine arts, social sciences, and natural sciences. The faculty and staff of the college provide extensive advising on individual academic programs and their possible career implications. Warren College students work within the following academic plan:

1. Each student must complete a two-course sequence in writing. Warren College 10A-B, the required writing sequence, *must* be taken immediately following completion of the Subject A requirement. The courses aim primarily to help the student develop an authentic voice in writing and an increasingly conscious control of language. The sequence moves from free writing through narrative to writing of a structural and critical complexity comparable to that of the college essay. Classes are small and are taught in workshop style, devoting most of their time to the discussion of student papers.
2. The college also requires that all Warren students complete a course titled "Ethics and Society", offered jointly by the political science and philosophy departments (Philosophy 27/Political Science 27). This course *must* be taken by the end of the sophomore year.
3. Warren students must also complete a two-course sequence which requires formal or algorithmic reasoning. Subjects that can be taken to satisfy the formal skills requirements are: two courses in calculus, computer science, or symbolic logic. All options must consist of two courses in one area except computer science and symbolic logic, where a combination is acceptable.



4. Students seeking the **B.A. or B.S. degree in arts and sciences** must complete two **programs of concentration** in areas distinctly different from that of the major. Each academic department offers one or more programs of concentration, each of which is a focused collection of six or more courses. A typical program of concentration will consist of lower-division course work which serves as an introduction to the discipline (e.g., Political Science 10-11-12) followed by upper-division advanced work in the specified area of study (e.g., comparative politics).

Students seeking the **bachelor of science degree in engineering** majors must complete two **area studies** in areas distinctly different from that of the major. One area study must be chosen from the humanities and fine arts; the other from the social sciences. A number of area study options are offered by various humanities, social science, and fine arts departments. Each area study will consist of at least three courses, of which one must be upper-division.

Each major, program of concentration, and area study is classified as belonging to one of three areas: humanities and fine arts; social sciences; or natu-

ral sciences, mathematics, and engineering. To ensure breadth in every Warren student's education, each of the two programs of concentration (for B.A. and B.S. arts and science majors) or area studies (for B.S. engineering majors) must come from a different discipline area, and both must come from areas different from that of the major. For B.A. and B.S. arts and science majors, at least two courses from each program of concentration must be taken at UCSD. For B.S. engineering majors, the one upper-division course required for each area study must be taken at UCSD.

Detailed information on program of concentration and area study offerings and requirements may be obtained from the Warren College Provost's Office.

## Double Majors

Double majors are required to include all three discipline areas in their academic plan. Thus, if the two majors are from different discipline areas, one program of concentration or area study from the third discipline area will be required. If the two majors are from the same discipline area, two programs of concentration or area studies will be required from the two remaining disciplinary areas.

## Pass/Not Pass Grading Option

General-education requirements may be fulfilled by courses taken on the Pass/Not Pass basis. Warren students are reminded that major requirements and prerequisites must be taken on the graded basis. The total number of Pass/Not Pass units may not exceed one-fourth of a student's total UCSD units toward graduation.

## Graduation Requirements

To receive a **B.A. or B.S. degree in arts and sciences** from Warren College a student must:

1. Satisfy the University of California requirements in American History and Institutions, and in Subject A. (See "Undergraduate Admissions, Policies and Procedures.")
2. Fulfill the general-education requirements described above.



3. Complete a major chosen from those regularly offered at UCSD. Each department determines the courses and grades required for its major; generally this will include a set of twelve to twenty-two upper-division courses. In addition, most majors require a certain amount of introductory course work, and the beginning student is urged to plan a program that will permit a wide choice of major fields. For example, calculus is required for a significant number of majors; a student who does not take this subject excludes all these majors from further consideration.

Students in good academic standing may be permitted to double major.

Students must secure approval by petition from the appropriate departmental advisers and the college provost. Students must fulfill the requirements (prerequisites and upper-division courses) of both majors. Additional criteria established by the Academic Senate must also be met.

4. Attain a C average (2.0) or better in all work attempted at the University of California.
5. Satisfy the college residency requirement that thirty-six of the last forty-four units passed (nine of the last eleven courses) must be taken as a student in the college.
6. Pass forty-five four-unit academic courses or their equivalent (180 units). At least fifteen four-unit courses (60 units) must be successfully completed at the upper-division level. No more than 3 units of physical education

(activity) whether earned at UCSD or elsewhere may be used towards degree requirements.

To receive a **bachelor of science** degree in engineering from Warren College, a student must comply with requirements 1. through 5. above. Additionally, the total number of courses must be forty-eight (192 units) of which at least eighteen courses (72 units) must be at the upper-division level. As with the bachelor of arts degree, no more than 3 units of physical education (activity) may apply. Presently the bachelor of science engineering degree is offered only in the following engineering programs: applied mechanics, bioengineering, chemical engineering, computer engineering, electrical engineering, engineering physics, engineering science, and systems science.



## The Warren College Scholars Program

The Warren College Scholars Program is a four-year program for students with a broad range of interests and with a history of outstanding scholastic achievement. It offers the scholar an opportunity to work closely with the faculty throughout his or her academic career at UCSD. High school seniors with a 3.8 GPA and an SAT score of 650 in verbal and 650 in mathematics or above are automatically eligible for admission to the program. Other students with strong academic credentials may also apply. (For more information, see "Warren College" in the section, "Courses, Curricula, and Programs of Instruction.")

## Academic Internship

Warren College administers an Academic Internship Program available to students from all four colleges. The program is based on the conviction that quality education results from a combination of classroom theory and practical experience. Participants work full- or part-time for a public or private organization. Placements match students' major areas of academic study and correlate with their career goals. Students may enroll in the program for a maximum of sixteen units in increments of four, eight, or twelve units per quarter. Although most placements are in the San Diego area, the Academic Internship Program is national in scope and varied in offerings. Students might work for a senator in Washington, a legal-aid office in Los Angeles, a business, a T.V. station, research lab or social service agency in San Diego, or any number of other possibilities. Working closely with faculty advisers, students write research papers that integrate their academic backgrounds and internship experience.

## Honors

Quarterly provost's honors, honors at graduation, departmental honors, and Phi Beta Kappa honors are awarded. For additional information see "Honors" in the Index.

## Honorary Fellow of the College

Harry N. Scheiber, Historian





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# FIFTH COLLEGE

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UCSD will open a fifth undergraduate college in fall, 1988. The San Diego Division of the Academic Senate has already approved the general plan described below, and a faculty committee is now implementing that plan by designing specific courses for it. Applicants interested in the college should write to

The Provost  
Fifth College  
University of California, San Diego  
La Jolla, CA 92093

Students in this college, like all others at UCSD, will be able to enter any major, but as they prepare for graduate work, for professional schools or for business careers, the background they gain from the college in international studies, comparative culture, and language will give them unique qualifications. The college will also encourage students to take advanced courses in languages and to participate in some type of study-abroad program.

Candidates for a B.A. or B.S. in the arts and sciences will take

- a three-quarter sequence in world civilization (the writing program will be part of this course),

- a three-quarter sequence in comparative culture or area studies,

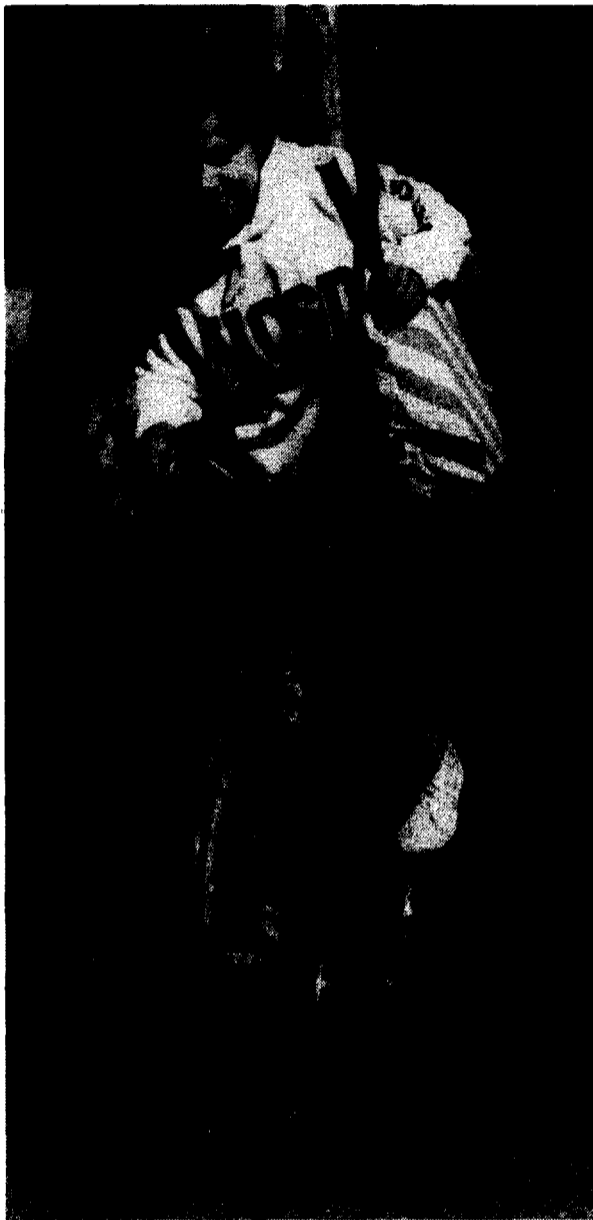
- three quarters of a foreign language,

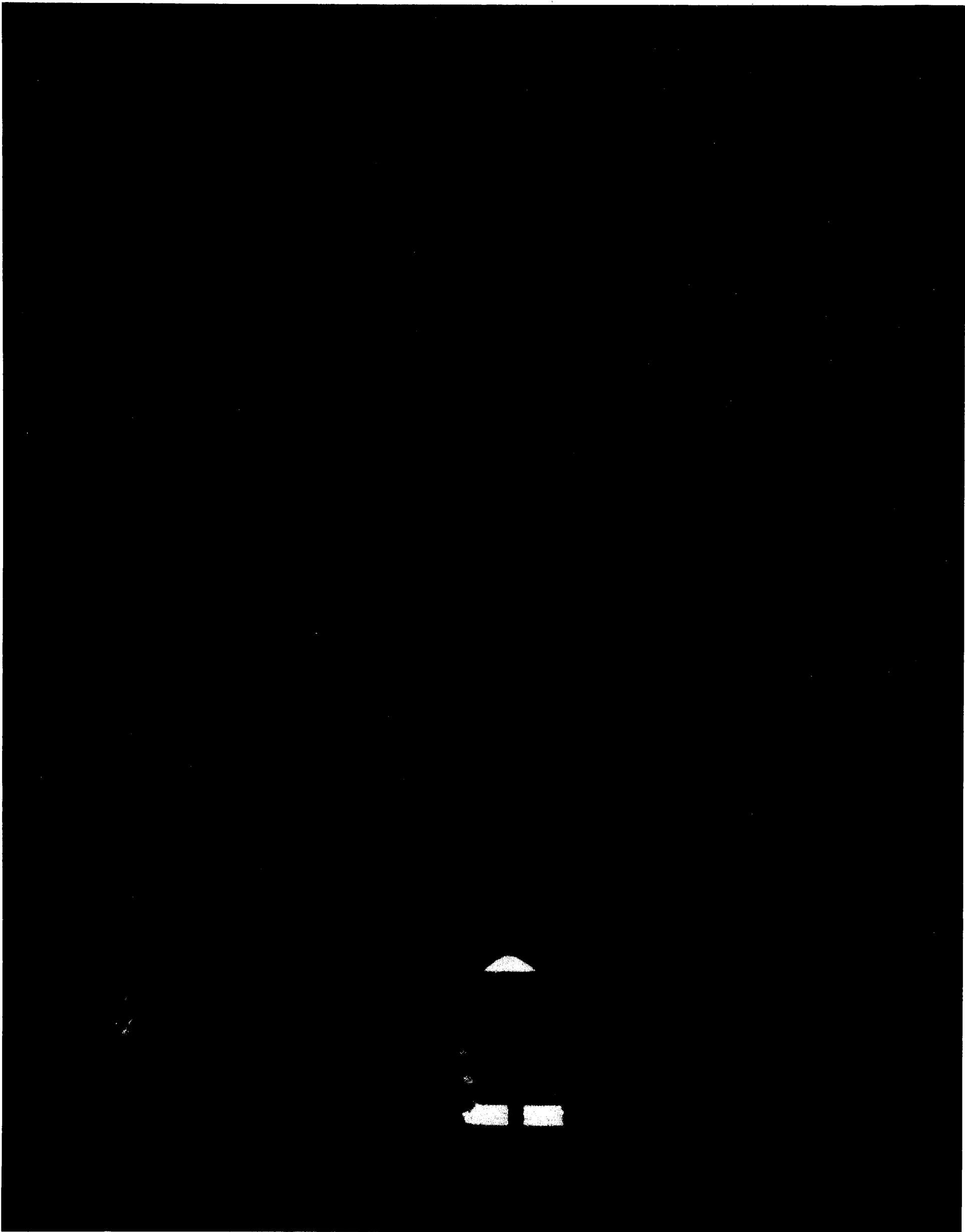
- a three-quarter sequence in math/computer science,

- two courses in fine arts, and

- three courses from a list, including science, advanced area studies, advanced language study, and quantitative social science.

Students studying for a B.S. in engineering will take world civilization, the sequence in comparative culture or area studies, three quarters of a foreign language, and the pre-major courses for engineering.





## INTERVIEWS

The University of California, San Diego, is one of the newer campuses of the University of California. We have just begun our second twenty-five years as a campus. In spite of its chronological age, UCSD is one of the major universities in the country. By almost any objective measure — membership in the Association of American Universities, the American Academy of Arts and Sciences, National Academy of Sciences, the American Philosophical Society, Fulbright and Guggenheim fellowships received, federal research funds received — our faculty in the three major units of the university, the general campus, Scripps Institution of Oceanography, and the School of Medicine, rate among the best.

Approximately fifteen thousand undergraduate and graduate students pursue degrees in a wide variety of academic programs. The undergraduate program at San Diego embodies the cluster college concept; each student and faculty member belongs to one of the four colleges: Revelle, Muir, Third, or Warren. This college structure provides an environment of social and academic interaction which is not available on most state university campuses.

I am convinced that the distinguished faculty we have gathered here and the academic programs they have developed, together with the splendid physical setting of the campus, combine to provide a university experience difficult to equal. The interviews which follow give some interesting and informative insights into UCSD by those whose presence is integral to that experience, UCSD's faculty, staff, and students.

*Richard C. Atkinson*

Richard C. Atkinson  
Chancellor



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## Sherley Anne Williams Professor of Literature

Sherley Anne Williams is a professor of Afro-American literature at the University of California, San Diego. During the winter and spring quarters of 1987 she took a leave of absence in order to write a screenplay adaptation of her new novel, *Dessa Rose*.

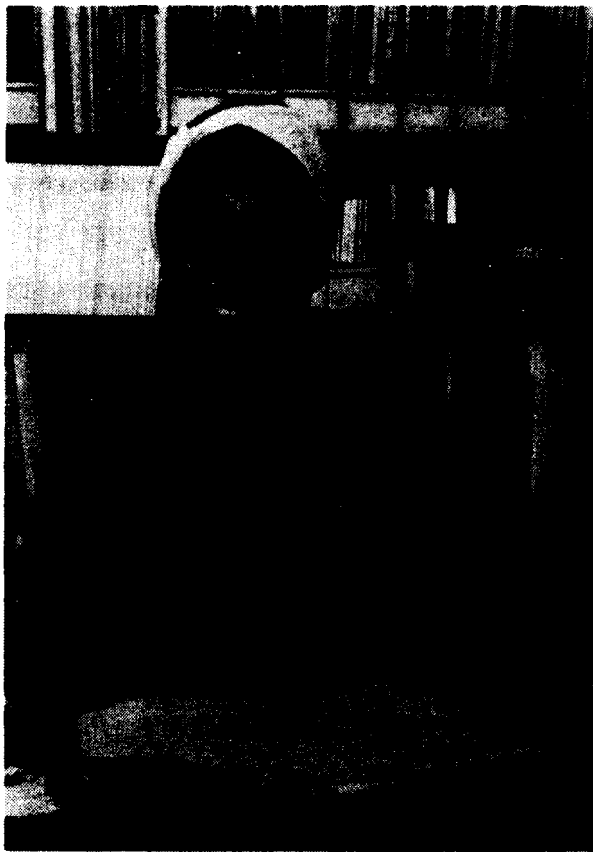
The success of Williams's novel, already into a third printing, was a "delight" for Williams, she says. "There are a lot of good books published every year, and most of them just go away without getting any kind of attention at all. To have had good reviews and media attention is very heartening. It certainly makes all of the effort I put into the book worthwhile."

The theme of Williams's book began seventeen years ago out of her short story called "Meditations on History." When Williams was a graduate student at Brown, she came across an essay by black activist Angela Davis about a pregnant black woman who had helped lead a slave revolt in 1829. Caught and convicted, the black slave woman was sentenced to die, but was kept alive until her child could be born.

Struck by the powerful revelation that not all slave women were passive about their bondage, Williams researched the source of Davis's story and came across a book by Marxist historian Herbert Aptheker called *American Negro Slave Revolts*. It was there Williams discovered the documentation of a plucky white woman who, in 1830, gave sanctuary to runaway slaves on her remote North Carolina farm. Williams fantasized about how it might have been if these two women had met. The results became grist for "Meditations," and for the novel, *Dessa Rose*.

### **Q. Are you planning a new work of fiction?**

**A.** I want to move, fictionally, into the twentieth century to trace the lives of a group of characters growing up in the Central Valley of California — the place I grew up. The time of the narrative would



span the twenty years after 1966, and would address some of the many changes that have taken place in black lives during that period. In a very real way, the last twenty years are as important in the history of this country, and in the history of black Americans, as anything that ever happened in the nineteenth century. The world has almost literally turned upside down. I want to reflect on that and talk about some of those changes. For example, these characters will come to recognize themselves as a transitional group. They grow up in an era where the civil rights movement is gathering force and will ultimately succeed in its objectives of abolishing legal segregation — but at the same time understand that the repeal of those segregationist laws doesn't guarantee a more perfect union. They have to cope with the aftermath.

### **Q. When will this book be finished?**

**A.** I have more than an outline completed. I need to complete the writing of the *Dessa Rose* screenplay; then I can sit down and put together what I have for this novel.

### **Q. Is it easier to discuss these events in fictional terms than in strictly historical terms?**

**A.** I deeply believe that fiction is a means of speculating on ways to make the impossible possible. While I am writing about contemporary issues and the things people have experienced, the characters are fictitious — however much they are modeled or inspired by a real-life person. You don't really want that real-life person to be identified.

### **Q. Now that *Dessa Rose* has become a property, so to speak, with a film contract and a paperback book contract, how is that success affecting your feelings toward the book?**

**A.** Property is an interesting word. Not so much a "hot property," in Hollywood terms, but another kind of view — the idea that the people who have read this book have really taken it to heart. The kinds of questions that I get when I go around the country [on promotional tours] are, "How are you going to keep Hollywood from messing it up?" It's as though the book now belongs to all of them, and they are out there wanting me to protect their interest in it. I hadn't expected that reaction — that people would want me to function as a gatekeeper for this screenplay. I see it simply as a book — it's not my first, and it won't be my last.

### **Q. What is the process of getting the book from novel to screenplay?**

**A.** Basically, I have been paring it down. The screenplay must be a series of scenes that will occupy no more than 120 pages — double-spaced — with these incredible two-and-a-half-inch margins. A friend told me to consider myself the writer of the recipe, and not the cook of the meal. If I begin to think of myself as cook, then I won't have a good screenplay. That has been an

**Edward D. Goldberg**  
Professor of Chemistry  
Scripps Institution of Oceanography

enormously helpful bit of advice. It has let me see that there are certain things I can't do — and don't have to do. The producer, Irwin Winkler, has been very sensitive to the process of the writer taking his or her own words and rendering them into a script — especially the first time around — and he's aware that the process is difficult to keep to a deadline. I won't know anything about the finalization of the script until the movie begins production. It's pretty scary. But it's a kick, too.

**Q. What is the scary part?**

**A.** You understand that what I am putting on this page, with my sweat and feeling, may not bear any relationship to the finished cinematic product, and it may not have that much to do with how good or how bad the finished product is. It is, after all, only the "recipe." Loss of control is involved. The rights to the book are sold. Being asked to do the screenplay has given me a vested interest in the outcome.

**Q. What will you be teaching in the fall quarter?**

**A.** I will be teaching a new interdisciplinary lower-division course, "Introduction to Afro-American Literature." I am really looking forward to it. I have been working on a study outline for a long time, and I can use it as an introduction not only to Afro-American literature, but as a way of understanding and evaluating literature itself. I will also be teaching an upper-division fiction writing course.

*A world-renowned expert on marine pollution, Edward D. Goldberg, professor of chemistry at Scripps Institution of Oceanography, has been concerned for nearly forty years about the ability of the oceans to accommodate the wastes of human society, without the loss of natural resources. In 1976, UNESCO Press published his stimulating book entitled The Health of the Oceans, in which he attempted to summarize the field based on his observations and the data available at that time. A controversial conclusion he derived was that the coastal waters of the United States are generally underutilized for waste disposal and that some of the laws regulating ocean dumping are irrational. A native Californian, Goldberg received his bachelor's degree from UC Berkeley and his Ph.D. in chemistry from the University of Chicago. After four years in the Navy during World War II, he joined the faculty of Scripps Institution. He has conducted research at the University of Bern in Switzerland and the Institut Royal des Sciences Naturelles in Brussels, Belgium. He has convened various seminars and conferences on marine pollution for national and international organizations, and has advised many scientific groups and government agencies on the topic. A member of the National Academy of Sciences and numerous other scientific organizations, he is considered one of the foremost experts on the chemistry of the oceans.*

**Q. How did you become interested in pursuing a career in science?**

**A.** My life-long interest in science is a consequence of stimulating teachers I encountered while in high school and from being in the Boy Scouts, a time during which I earned many merit badges involving science projects. Later, I had the good fortune of having first-rate professors at Berkeley in chemistry, physics, and mathematics. These educational experiences made scientific scholarship an attractive area to work in for me.



**Q. What caused you to turn your interest in chemistry to studies of the oceans?**

**A.** It was totally by accident that I became a marine chemist. While I was completing my doctoral work at Chicago, I was applying for a variety of jobs in chemistry. A professor I had studied under, Harrison Brown, made a visit to Scripps Institution and spoke with then director Roger Revelle who was seeking young chemists to join the faculty. Brown suggested that I would be a likely candidate. Soon after Revelle made me an offer, I came here and have stayed ever since. At that time, in 1949, Scripps was a small research center with about 200 people, and La Jolla was a very attractive place.

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**Q. Can you give a simple assessment of the condition of the ocean environment today?**

**A.** There is an awareness today that human society can alter the composition of the oceans, sometimes favorably, sometimes unfavorably. My colleagues and I in the environmental science community have continually questioned what is happening in the oceans. And there have been some unpleasant episodes, such as the death of many Japanese citizens by the consumption of mercury discharged from a chemical plant. My general assessment is that the oceans are in quite good shape with respect to the loss of resources by the deliberate entry of materials by man. I wrote that in my book on the subject in 1976, and I maintain that we have had improvement since then. This doesn't mean we can be relaxed and unconcerned with potential insults to our coastal resources.

**Q. What can an individual who is concerned about marine pollution do?**

**A.** There really isn't too much an individual can do about marine pollution, but I would encourage those who are concerned to support scientific groups, such as the International Council of Science Unions or the Intergovernmental Oceanographic Commission, both of which have committees continually assessing the health of the environment.

**Q. Is there an ideal solution to the problem of waste disposal?**

**A.** The world society is by nature a disposing society, rather than an accumulating one. Each year, more than three billion tons of mineral, food, and forest products are utilized worldwide, most of which becomes waste very quickly. For the most part, these wastes are discharged to land sites, some by combustion to the atmosphere, and some to the oceans. On scientific, technological, economic or social grounds, any one of these discharge sites for wastes may offer advantages over the others, depending on the nature of the waste material and on the proposed area. For example, I would argue that land sites are preferable for the storage of high-level radioactive wastes. The atmosphere, I suggest, can accept the combustion products of terribly toxic organic compounds such as PCBs — at least more readily than the original materials can be accommodated on land or in the sea. The domestic wastes from the millions of people living in the southern California region are readily taken up by the coastal waters without an unacceptable loss or injury to marine resources.

**Q. How can the best place to dump wastes be determined?**

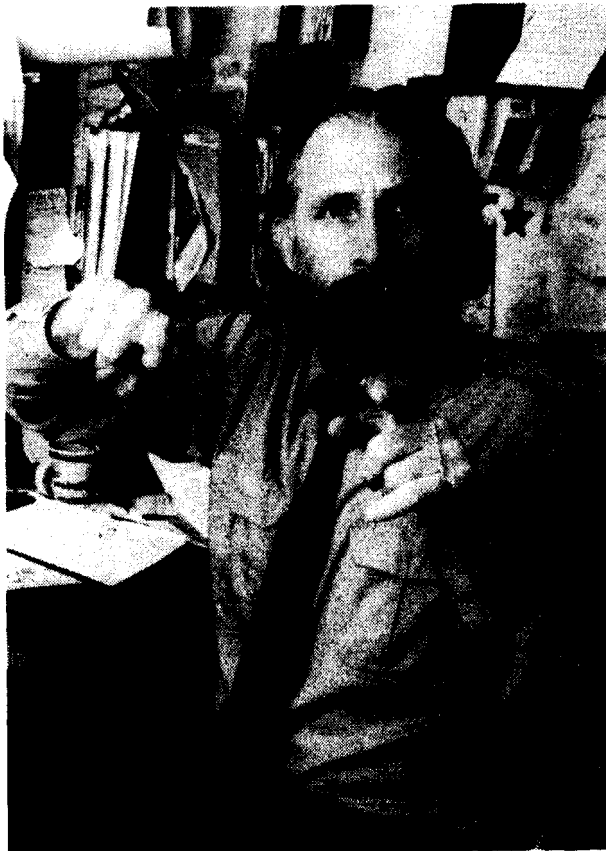
**A.** It can be extremely difficult to determine the best place to dump wastes. One approach to ocean dumping is to try to determine the assimilative capacity of a body of water for a given waste. This assimilative capacity is simply the amount of waste that can be introduced per unit time without unacceptable impact on the ecosystem in question. Although subjective judgments are involved, they are based on the best available knowledge and subject to revision when better data are available. Perfect knowledge is simply unattainable.

**Q. What advice would you give students interested in environmental sciences?**

**A.** I would say to maintain a strong commitment to a scientific discipline, be it chemistry, biology, mathematics, or whatever, as an undergraduate. Then attend a first-rate graduate school that will focus that discipline on environmental problems, be it in the oceans, on land, or in the atmosphere. Upon graduation, if academic research is of interest, seek out an affiliation with an institution or university concerned with environmental problems. Be assured that in oceanography, the concepts and technologies of the late 1980s in chemistry will provide a young marine chemist with many opportunities. Our understanding of the chemistry of the oceans will always be based on the conventional wisdom of the time, which constantly keeps changing. We will be able to understand the make-up and chemical reactions in the oceans better with time, which will allow us to protect more readily, as well as exploit, ocean resources.

**Ron Carlson**  
Director of the Crafts Center  
and Grove Gallery

*Situated next to the student center in a grove of eucalyptus trees on the Revelle Campus at UCSD, the Crafts Center provides a wide-ranging series of noncredit courses in arts and crafts. About a dozen exhibitions of the works of student, faculty, and local artists are displayed in the Grove Gallery each year. The gallery also has a store that sells high-quality originals and reproductions of art, at reasonable prices. There is also a coffee and pastry shop where students can meet to relax or chat.*



**Q. What is the Crafts Center?**

**A.** It is a creative skills learning center that provides students of all levels of competence opportunities to experiment with and master the arts and crafts. It's a place where students can learn in a relaxed, non-pressurized, non-academic setting. People with no experience whatsoever can come in, get their feet wet, and see if they want to pursue their interest in arts and crafts. The more qualified students are welcome to develop their skills. The Crafts Center combines studio space, materials, accessibility, and instruction to give students the best possible learning experience.

**Q. What courses are offered at the center?**

**A.** We teach ceramics, photography, stained glass, jewelry, drawing, painting, basket weaving, silkscreening, and basic guitar. Obviously we can't do everything; we only want to do what we can do well. Our ceramics facilities are as large as those found in most colleges and we have a fully equipped darkroom with six work stations for photography. Students have access to all of the facilities at any hour of the day or night.

**Q. What types of students are likely to take advantage of these opportunities?**

**A.** Almost 10 percent, representing a good cross-section of the total student population of UCSD, pass through the center every year. That's an impressive percentage — twice the national average — considering that the campus has a reputation for being science-oriented. Perhaps it's because these students have never before been offered such opportunities to explore art and express themselves. Another important aspect of the Crafts Center is that it brings together students, faculty, staff and off-campus people, all sharing space and ideas and learning together.

**Q. How do students develop at the center?**

**A.** Students very often come here alone, get involved in classes, and begin to develop strong friendships with each other. Most of the students are very dedicated. Many of them soon become studio assistants who help beginning students. They often become part of the Crafts Center family by getting involved in the Grove Gallery exhibitions and volunteering to spend time in the store. They can continue to develop their crafts throughout their entire college careers.

**Q. Who are the teachers?**

**A.** We have a professional staff of twenty-two instructors, most of whom hold degrees in their fields. Professionalism is very important when you're helping people do something they have never done before. It can be very intimidating. Therefore it's important that the students have a really good learning experience. There is a definite learning curve in acquiring these disciplines and techniques, and students have to be led through that curve. Moreover, we try to keep our classes small in order to develop good relationships between students and instructors.

**Q. What is the purpose of the Grove Gallery?**

**A.** The gallery was built in 1983 so that people could see the high quality of the work done at the Crafts Center. We also exhibit the work of successful local and regional artists, very often in conjunction with workshops, so that students can learn from the masters. That's something we have here that a lot of crafts centers and galleries don't have — the ability to put together both a show and a workshop. We invite nationally known artists to do a workshop. They'll send their work here a month before the class. We'll mount a show and students will be able to see the work, have an opportunity to buy the work and take a class from the artist. Prior to the workshop we will schedule an evening lecture. The artists share their life experiences, their knowledge, and their techniques. For example, not too long ago we had Paul Soldner, from Colorado, for a two-day

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## David Miller Professor of Engineering

workshop. He is probably one of the top three clay people in the United States. We had a retrospective of his work. From collectors in the area, we borrowed his pieces that dated back to the early '50s. There was a very nice marriage of the show, the lecture and the workshop.

Other galleries have shows but they are usually the non-participatory kind, where you go in and look. At the Grove, there is interaction with the artist, the art, and the participants. There's a learning experience that goes along with that.

### **Q. Any plans for the future?**

**A.** We hope to start glass blowing, an endeavor we've wanted to undertake for years. We will have the use of a huge glass-blowing studio off campus, and we hope to build up enough expertise and enough interest. In this way, we can get started, see what the interest is, and learn how to develop the program. It's the kind of craft that's rarely offered in this type of a setting because it is so expensive to learn.

*David Miller, professor of engineering, is not only one of the original faculty of the engineering program at UCSD, he is also one of the finest teachers on the campus. Miller, who won the 1986 Distinguished Teaching Award from the UCSD Chancellor's Associates, graduated from high school in Long Beach in 1958, just after the Soviet Union launched Sputnik. It was a wonderful time to choose engineering as a career. Miller headed off to UC Berkeley to become a chemical engineer. He came to UCSD in 1966 as an assistant professor just after receiving his Ph.D. from Princeton. "It really wasn't a very traditional engineering program," he recalls. "It was more like an applied science program, which I very much appreciated. It was a chance to interact with engineering scientists from several other disciplines. I found it very rewarding in terms of broadening my knowledge." Since arriving on campus he has developed a strong research program in gas dynamics and surface science. During the past two decades, Miller has watched engineering incorporate more traditional programs and grow to become the most popular major at UCSD, enrolling more than 3,500 students in its Division of Engineering.*

### **Q. Why did UCSD decide to set up a division of engineering and not a school of engineering?**

**A.** A school does things which we weren't prepared to have engineering do. A school acts in the UC system very much as a college does at UCSD. A school controls its own admissions, sets its own general-education requirements, and grants its own degrees. This meant we would usurp the college prerogative if we were to set up a school of engineering, and we didn't want to do that. We didn't want to make engineering students special, to isolate them from the rest of the student body. By and large our faculty felt it was best to have our students attend the colleges and remain part of the university community. At the



same time we needed some entity to identify engineering and make it more visible off campus. We came up with the terminology "Division of Engineering," which turned out to be very acceptable in the UC system and is an appropriate name for the situation we have here.

### **Q. Why do you feel engineering students should not be isolated from the rest of campus?**

**A.** I think it is important and healthy for them to interact with students in other disciplines. You will find that we have more general-education requirements in the humanities and social sciences in our engineering program than most schools. Our students are outstanding. They come here for a good education. I think engineering is one of the most difficult programs to go through in terms of curricular demands. I'm sure of that. But, there is a reward — they have a job waiting, and it is a well-paying job.



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**Q. How do students benefit from coming to UCSD?**

**A.** I think the great thing about UCSD is that we are strong in almost every department. When one of our engineering students walks over and takes a course in history, he or she is taking it from one of the top scholars in history. I think our students get a lot more attention here. They have done extremely well in going on to graduate school, getting employment, and doing well in their jobs. Companies that have hired our students are now very pleased and they come back looking for more.

**Q. Were you excited about winning an award for excellent teaching?**

**A.** I was surprised I got it, frankly, and very pleased. It was rewarding to have the recognition. I think it takes a lot of effort to do a good job in teaching. I make that effort because I learn when I teach. I have been teaching some of our required engineering courses, mostly to juniors and seniors. I think these are very demanding subjects. But, again, we have good students who respond. I enjoy interacting with students.

**Q. Do you do anything special when you teach?**

**A.** I have one technique that I normally use in classes. I don't usually dictate a textbook into the students' notes. We have a lot of good textbooks in

engineering, so I have never thought that was necessary. I usually spend a large part of my lecture asking questions of students in class. I used to do this long ago when we had small classes of ten or fifteen students. Now, I have learned to do it with large classes. It's just a matter of calling on students and asking them a question germane to the topic. A few students don't like that. They feel they are being exposed in class. But, by and large, most of them appreciate the result. I hope I've learned to do it in a thoughtful and gentle enough manner that it is more educational than threatening. But, we learn. I learn what the students know and what they don't know and what their real problems are. It always amazes me that when I call on a student and he or she doesn't know the answer, usually 80 percent of the class doesn't know the answer, either. I enjoy it. It gives me a way to interact with the class. It is a method of teaching that Socrates used.

**Q. Isn't it unusual for an engineering class to be taught by the Socratic method?**

**A.** Yes, but it works. It really works. Especially when you have good students. You have to learn how to adapt it, and I have. I find it very rewarding. It's very easy to race ahead of the class when you are lecturing out of a book. I have decided it is not so important how much you teach as how well you do it. There's no point in teaching thirteen chapters when the students can only absorb seven. I still try to make reasonable progress, and I have goals. But, if you have a good book, and you assign homework, there is no reason to read the book to them in class.

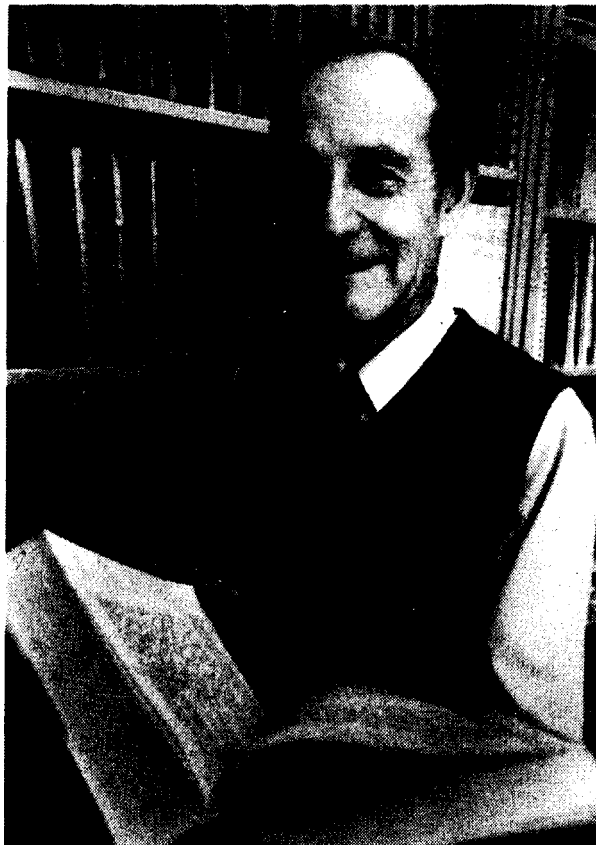
**Q. What words of wisdom do you have for potential students in engineering at UCSD?**

**A.** I think you have to learn to be very disciplined with your time. You have to be willing to spend sixty hours a week on your courses. It's a full-time job to be a student in engineering. You have to be well grounded in mathematics, because that is our language. I hope the student comes into engineering for an education, not for a job. When you put blinders on and you are here for one purpose, to be trained as an engineer, you're not educated as a student, and you are not taking advantage of what a university like UCSD offers you. There are a lot of opportunities to broaden yourself in the best sense. Engineering is a good choice, but you are going to have to work hard.

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## David Noel Freedman Endowed Chair in Hebrew Biblical Studies

*David Noel Freedman, one of the foremost biblical scholars in the world today, recently joined the UCSD faculty when he was named first occupant of the Endowed Chair in Hebrew Biblical Studies. Although Freedman is tenured in the history department, his Chair is one of two endowed in the rapidly growing Judaic Studies Program. He is a native of New York City who entered City College of New York at age thirteen and graduated from UCLA shortly after his seventeenth birthday. Since earning his Ph.D. in Semitic languages from Johns Hopkins University, Freedman has devoted his career to studying the Bible. He is editor of the Anchor Bible, a massive series of scholarly commentaries about the Bible, and the author of numerous scholarly books and articles about the Bible and its history. Freedman is considered one of the most sensitive living readers of ancient Hebrew poetry.*



### **Q. Exactly what is the Anchor Bible?**

**A.** The Anchor Bible is an attempt to perform the simple function of putting the modern reader in the place of the ancient reader. The purpose is to supply background information about all the things that the Bible doesn't tell you, but assumes you know. When it refers to Jerusalem, it doesn't give you the coordinates of the latitude and longitude, it assumes you know where it is. It also assumes you know what it is, and what the population is. It's as though we were to talk about San Diego. We wouldn't give out an encyclopedia article each time and say this is the population and these are the industries, and so forth. We take all that for granted. Unfortunately, twenty-five hundred years later we don't know that. Therefore we must try to recover the setting, the framework, and that's the purpose of the Anchor Bible. You use all

these clues from archaeology, from commentators over the centuries. You try to reconstruct the scene, the language, the background, the history, the sociology, the economic and political situation, fill in the whole picture so that people today can be comfortable and read this book as though they were the original readers.

### **Q. How long have you been the editor?**

**A.** Over thirty years. I started in 1956. And it will go on for at least another ten or twelve years. This will be a lifetime work, which was not my intention at the beginning.

### **Q. How long did you originally think it was going to take?**

**A.** The original idea was to do the whole thing in about five years.

### **Q. Why is it taking so long?**

**A.** Well, ask some of the scholars. The original intention was simply to produce a new translation in modern English with footnotes and an introduction. It has

expanded to become a full-scale commentary, and that is a much more ambitious project. Originally we were going to do the whole project in thirty-eight volumes. We passed thirty-eight some time ago.

### **Q. How big is it going to be now?**

**A.** We're a little uncertain. There are now forty-three volumes and we have definitely passed the halfway mark. We have somewhere between twenty and twenty-five volumes to go. Most of them now are approaching completion, so I can say without undue optimism that we can see the end in maybe another ten to twelve years.

### **Q. You must feel as if this is some sort of incredible detective story.**

**A.** That is the chief ingredient. You use clues to solve puzzles. This is something that can appeal to everybody. The stakes are a little more serious. It is not only rewarding to a person who does it, but it is meaningful for people who are genuinely interested in finding out what the Bible says and what it means.

### **Q. Is there a lot of interest from students in learning about the Bible?**

**A.** There is increased interest in religion and it is not simply from fringe groups or ultraconservatives and fundamentalists. There is broad interest partly because the Bible is great literature, more because it is the sacred book of major religions. And it is possible now to explain a lot of things

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**Nolan E. Penn**  
Professor of Psychiatry  
School of Medicine

that couldn't be explained before, and to present a picture of a difficult story. When you get down to it, this is a great heroic tale in the tradition of *The Iliad* and *The Odyssey*. In many ways it's even more impressive because it is the first attempt to tell the story of a whole people, and to trace their origins back before the beginning of a nation. It's really an extraordinary, remarkable, unique achievement.

**Q. Is Biblical scholarship a thriving field?**

**A.** Yes, it's booming. New positions are opening up. Enrollments are increasing. It has been remarkable, because in the first twenty years or so that I was in the field, jobs were very scarce and enrollments were very low. There really has been a revival. The most obvious example is the Judaic Studies Program. All over the country, these programs have just mushroomed. Ours is especially unusual because we concentrate on the Bible. Most programs don't. This [the Bible] is the tradition of everybody. I think more and more we're trying to get that message across. Whether you are religious or not, the Bible is part of your heritage. It's one of the most important parts of anybody's heritage.

*Nolan E. Penn has managed successfully to combine the vigorous pursuit of an academic career with a deep-seated concern for the community.*

*He earned his Ph.D. in psychology from the University of Denver, with additional training at the University of Wisconsin Medical School and Harvard Medical School. He joined the faculty of the University of Wisconsin, where he eventually became founding chairman of one of the nation's first Afro-American studies departments. When he came to the UCSD School of Medicine in 1970 as professor of psychiatry, he was enlisted by the general campus to establish the Urban and Rural Studies Program. He served as coordinator for the program during its early years, while directing group therapy and community and forensic psychiatry at the School of Medicine.*

*Since 1982, Penn has served as regional director of the Area Health Education Center (AHEC), a federally sponsored program to improve the delivery of health care in underserved areas. The regional program is administered through the UCSD School of Medicine.*

*"AHEC is looking at ways to educate people to do a better job at serving the disenfranchised, medically underserved community," he explained. "I believe that people have an absolute right to health and health care, and we have a responsibility to do something about maintaining that right. We've created an impressive number of programs covering dental, educational, mental health, and family health care needs."*

*He has also pursued his own research, with a particular focus on the elderly.*

*"I found out that if you want to know about staying healthy, about risk taking, about 'coping' or strategies of adaptation, you should ask someone who's older and has time to think back and reflect," he said. "I want to know how they came to be eighty-five or ninety years old, how they faced options, changes, and structures both rigid and flexible."*



**Q. You have certainly developed some effective strategies in your own life. What was your childhood like?**

**A.** I grew up in Louisiana which at the time was very segregated. We weren't allowed into most places, or if we were, we were only allowed on certain days. For instance, we could go to the circus or fair on the last day when they were breaking things down.

One of the places we could go was to the corner drugstore in the colored neighborhood. There was a library upstairs, furnished by the pharmacist, so we could get a soda pop and then go upstairs and read. Even then, I would always read certain books, mostly with psychological themes.

I graduated from the Central Colored High, where everyone was black, except the superintendent. I knew my parents loved me, and in that community we were all responsible for each other. Even though there weren't many phones, if a phone call came into your community, you learned about it quickly. The

community and my parents learned ways to survive and grow even though external forces were very oppressive and unsafe in many ways. Some people got into very difficult trouble, but those of us who didn't had learned that if you gain mastery over certain forces, you can do what you want to do.

**Q. Did you dream then of becoming a psychologist?**

**A.** No. I was taught that education was a route out of poverty, and we were poor, so I knew I wanted to get an education. But as children, we weren't aware of many of the professions; for example, we would watch a building go up and we knew carpenters were doing the work, but we didn't know that an architect actually designed the building. We were told that we could be one of three things: a preacher, a teacher, or a medical doctor. I knew I didn't want to be a preacher, to my mother's chagrin. I thought I might like to be either a teacher or a doctor.

In college, as part of the pre-med program, I took some introductory psychology courses. I liked the courses, but I didn't continue because I didn't care for the approach of the people teaching the courses. They seemed very conservative, while I had come from an environment in which I was aware of almost paralyzing, oppressive forces and realized that there had to be changes. I sought out courses that I felt reflected humanity, such as world history and other social sciences, which discussed how issues and problems have traditionally been solved.

**Q. When did you switch from medicine to psychology?**

**A.** Immediately upon my graduation from high school, my family moved "up north" to Los Angeles, California, where

I began my college education. I considered medical school attendance, but realized very quickly that, one, it would be prohibitively expensive, and two, except for the two black medical schools, Howard and Meharry, my chances of being accepted would be very limited. The white medical schools were not yet ready to admit colored people. I can count on one hand the number of my buddies, who were brilliant students, who managed to go on to medical school, osteopathic school, and chiropractic school. I decided to spend a fifth year at college and get my secondary school teaching credential. Since I was only twenty and couldn't yet work as a contract teacher, I substituted for a year, then enrolled in a graduate program in educational psychology, with the intention of becoming a school psychologist. I earned a master's degree at USC, and was drafted immediately into the military.

I experienced a bit of good luck. Because of my education and experience working in state mental institutions, instead of being shipped off to Korea, I was sent to Fort Sam Houston in Texas with orders to go to the Army School of Clinical Psychology. This very intensive educational experience showed me that psychology was different from what I had studied in regular college classes, and I worked with psychologists who were different from what my initial impressions had been. Perhaps I had changed, matured and become more tolerant. At this point, I realized that clinical psychology was the profession that I wanted to pursue. I managed to continue graduate level study while in the army, and upon my honorable discharge I entered and completed a Ph.D. program at Denver University.

**Q. You have successfully balanced an academic career with community involvement. Why is it important to you to do both?**

**A.** My mother was always active in the community, helping people who were down and out. She had a high school degree, and she had studied correspondence nursing and gotten a certificate, so she was the local folk doctor. We farmed a few acres, growing our own food, and she had a job, but when our work was finished, she would take us kids along to the back country to look after the sick, take care of trauma wounds, help people with problems such as getting Social Security benefits delivered. She knew how to work the system to get things for people who had nothing.

I have always found a way to place myself in situations where I could see these kinds of problems. In San Diego, for example, in the rural and urban areas, there are people who suffer needlessly, and there are other people in the community, and here at the university, trying to do something about it.

I am about to complete my seventeenth year as a volunteer member of the School of Medicine Admissions Committee. We feel that if you want people who understand the poor and disenfranchised, you have to go out and find bright people from these areas, educate them and train them, and some of them will go back and help improve conditions. Those who do will have an affinity for the community, and be sensitive to the language, colloquialisms, and cultural identity of the community. We've found out from our own School of Medicine that these individuals do tend to go back to their communities to provide service and care. This is particularly so if they happen to be of black or Hispanic origin.

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**Donald Helinski**  
Director of the Center for Molecular Genetics

It can be difficult to accomplish what you want to achieve in the community, but remain successful within the academic system. For many of us, this is part of what we are trying to express to kids and their parents. We want to encourage young people to study, to work toward mastery, to think rationally, act purposefully, and behave appropriately within the framework. There is interest at this university in looking at contemporary issues, and developing interlinkages between the "ivory tower" and the world out there. Our commitment to affirmative action shows that we are trying to get people from all walks of ethnic life to believe that education is important, to do what is necessary to progress through school and into careers, and to help all of us build a more integrated, socially and culturally rich habitat.

*Don Helinski is a molecular geneticist, a profession that didn't even exist when he was a graduate student in the late 1950s at Case Western Reserve University in Cleveland. He did his postdoctorate work at Stanford University, which had strong programs in genetics and the biochemistry of nucleic acid, the precursors of molecular genetics. When he was at Princeton University in his first faculty position, the two disciplines began to merge, and soon biologists were tinkering with genetic material for the benefit of humankind.*

*"I had the good fortune of being at the right place at the right time when all this was developing," the soft-spoken scientist said.*

*Helinski joined the UCSD Department of Biology in 1965 and was one of the principal founders of the campus's dynamic new Center for Molecular Genetics, a research unit devoted to probing the structure of genes, identifying the products that specific genes code for, and learning more about the regulation of gene expression.*

**Q. Why do we hear so much about molecular genetics today?**

**A.** I think most people will agree that among the natural sciences, which include chemistry, physics and biology, the true revolution today is taking place in the biological sciences. In a relatively short period, biology has evolved from a science of observations to a science of intervention via the techniques of molecular genetics and recombinant DNA. These techniques provide enormous opportunities to improve upon public well-being in the areas of agriculture and medicine. And I think that is the icing on the cake; not only are we going to have the satisfaction of greatly expanding our knowledge of life systems, but there is going to be some profound fallout in terms of benefits to society.



**Q. What are the plans for the Center for Molecular Genetics?**

**A.** What we now have is a core building that will house seven major laboratories comprising 100 to 150 scientists from several different departments, all using or learning to use the techniques of molecular genetics. The building will have facilities and instrumentation for synthesizing parts of genes and analyzing their structure. We also hope to develop a world-class computer center for the comparative analysis of gene structure and protein structure. And finally, we envision the university as a resource for San Diego's biotechnology community. It is probably one of the four largest biotech communities in the United States. I think UCSD can play a real role in the continued growth of biotechnology in the San Diego area.

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**Q. What is the focus of your research?**

**A.** I'm working largely with communication between bacteria and plants. Bacteria and plants "talk" to each other using chemical signals. We are particularly interested in communication between a bacterium and certain plants that results in a symbiotic association. What we learn from the work going on in my laboratory and others may someday have an enormous impact on the agricultural industry. The bacterium, in this instance, uses nitrogen from the air to make nitrogen fertilizer for the plant. In exchange, the plant supplies the bacterium with an abundance of energy. This process occurs naturally only in certain legume crops, and one of our goals is to be able to manipulate the genes of the bacterium to increase its efficiency in providing nutrients to these plants. We hope to enable farmers someday to rely more on naturally produced fertilizers and less on expensive and often polluting chemical fertilizers.

**Q. What first attracted you to UCSD?**

**A.** The reputation of the University of California. I was very much attracted to the concept of high-quality public institutions — universities that provide an outstanding education for students at a relatively low cost. Despite the very difficult years that we have had with Reagan and Brown budget cuts, the university continues to provide this kind of an education for students of all economic levels. I was also attracted to the University of California by its high-quality faculty. They stand out in both teaching and research. The quality of scholarship at UCSD has placed the campus among the top public and private research institutions in the nation. As a result, this is a very stimulating environment to work in.

**Q. Do you have a preference between research and teaching?**

**A.** I enjoy teaching very much. I find it very supportive of my ego. I have 200 undergraduate students who are a captive audience, and I can share my knowledge and my experience with them. It is very satisfying. At the same time, however, it is necessary to strike a balance between teaching and research that allows one sufficient time to pursue one's scholarly interests in a serious way. And I am convinced that time spent in research is extremely valuable in terms of one's teaching effectiveness, particularly in an area where the advances are so rapid and the excitement level is so high. I think it would be very hard for someone to convey this excitement to undergraduate students if he or she were not actively involved in research.

**Q. How would you describe the undergraduate program in molecular genetics at UCSD?**

**A.** While a limited amount of biology is required during the first two years, the program at UCSD and many other top universities concentrates initially on physics, mathematics, and chemistry. These fundamental sciences give students a strong grounding in the foundation areas for molecular biology and molecular genetics. It is important for students to begin with the language of science. And that language is in chemistry, physics, and mathematics. Once the student becomes proficient in those areas, then biology courses will become more intelligible, more meaningful.



## Mary Morales Senior, Third College

Mary Morales grew up with a curiosity about the people and events which shape her world, a deceptive ease about things scientific, and a family-nurtured respect for the value of a good education. In high school she set a goal of attending the University of California, — not an unusual goal for a student in an affluent Palo Alto high school, but an ambitious one for a student with a learning disability. As Mary talks about her future, it is clear she will someday be helping others achieve that same goal.

### Q. Why did you choose UCSD?

A. I came to UCSD because it was a relatively small University of California campus, and I heard it had a really good biology department. I had never lived in Southern California and I wanted more of the personal education you can get on a smaller campus. The kind of student I am, I knew I needed more personal attention.

### Q. Why is that?

A. I'm dyslexic. I didn't learn to read until I was in the fourth grade. So reading didn't just come naturally to me. In fact, my whole learning process was behind in reading and spelling, although my comprehension and math skills were fine. So I think that's why I stayed in science. Math and science were subjects I could learn without reading and writing too much.

In high school I was put in remedial classes because of my language problem. So I had to fight against the high school system to be able to take college prep courses. They wanted to keep me in lower level English and I knew that would hurt my chances of getting into college or into the UC system. So in my freshman year in high school I took both college prep English and lower-division English. That proved to them that I could move up and get the course work I needed.



### Q. How would you describe your family?

A. My dad is Mexican-American from Gary, Indiana, and my mom is Sicilian and German-English, from New Orleans. My mom started her master's program in social work when I started my freshman year at college. We called each other on the first day of school. My dad went to graduate school in biochemistry at Stanford and is a hospital administrator. I have an older sister and brother. I grew up in Palo Alto, which has a very small Mexican-American community. In fact, there were only fifteen Mexican-Americans in my high school.

### Q. What has been your academic experience at UCSD?

A. You aren't alone in studying at UCSD. It's not just up to you to figure your way through classes and tough assignments. There are a lot of support systems here. OASIS provides tutoring and help in certain subjects. And there's the Minority Honors Workshop. The workshop encourages you and helps you organize study groups with other students from similar backgrounds.

Soft Reserves provides past tests of professors and answers to problems after your work has been turned in. Associated Students provides a note-taking service. AS hires a student to take notes which are xeroxed and can be bought a week after the lecture. They help you organize your own notes and give you detail and background information that you didn't pick up on in class.

### Q. What do you think is unique about Third College?

A. Third has an academic program I like. You get to study contemporary issues, and I enjoy studying subjects other than biology. I enjoy history and urban studies and planning — even though they're not my major. There is this huge Third World out there that I represent and I know nothing about. The contemporary issues we're studying pertain to me and what's going to happen to me when I get out of school.

### Q. What's it like to be a biology major?

A. I like the approach of the Department of Biology here at UCSD. They give you one year of intensive preview. For example, when we studied the cell we studied everything about it — its biochemistry, microbiology, and membrane biology. In the upper-division courses you get ten weeks of just one of those subjects, but you're building on the intensive preview you got earlier.

### Q. What do you hope to do when you graduate?

A. I think I want to teach high school biology in a large Mexican-American community. I want to go back to high school and encourage more people to go on to college. There's such a large population of Mexican-American people in Southern California, but relatively few go on to college. So there must be some kind of barrier that shouldn't be there. I didn't feel that barrier coming from the high school I was in.



## **Parenthesis Devers** Senior, Muir College

### **Q. Do you feel any barriers here at UCSD?**

**A.** I think all students feel a little bit of a barrier when they first go to college. They wonder how ready they are. And they doubt themselves: Are they going to be able to make it through? Is this really the major I want to be in? What I like about UCSD is that there is a lot of support to get over the hurdles and be more secure about yourself as a student.

### **Q. If you were teaching high school now, what advice would you give students about going to college?**

**A.** I'd say learn to talk to your parents about money and financial issues. When you go to college you're in charge of your money, getting your fees paid, and perhaps dealing with financial aid. Every time you buy your books you're writing a check. The first time I wrote a check was when I went to college. And I'd say learn to use the services that are here, like workshop groups, tutoring programs, academic counseling, and peer advising.

Build up your skill in learning on your own and in working with a group. Try going through the textbook, getting your own knowledge, and then working in a group so that everyone benefits and learns. You're not just getting the answers but you're also being able to provide answers. In college there are many classes you can do alone but it's much easier to work in groups.

*Parenthesis Devers is a student from Bonita, a suburb of San Diego, who has combined a successful academic career with social responsibilities and recreational activities at UCSD for the past four years. He is majoring in economics and political science, running for student office and busily engaged in a wide variety of sports events on campus, something which is made easier by the flexibility of Muir's general-education program.*

*He is also chairman of the Commuter Board; a committee that helps to make life that much more enjoyable for students who live off campus.*

### **Q. What are your immediate plans?**

**A.** I am twenty-one, majoring in economics with a minor in philosophy. However, I intend to stay at UCSD for a fifth year, run for student office, and pick up a major in political science also. I'm thinking of law school after that. This summer I am planning two internships, one in a law firm, and one in business. I will decide then which one I will feel more comfortable with for the rest of my life.

### **Q. How did you become interested in these subjects?**

**A.** My interest in economics grew out of a general interest in the way society functions, particularly in the part played by smaller companies. As far as politics are concerned, I'm interested in the problems of South Africa and other social issues closer to home. My goal is to work towards a more just society.

### **Q. Why are you running for student office?**

**A.** I want to contribute to the social life of students at UCSD by making their years of study more enjoyable. I hope to become program chairman with the Associated Students (the main student representative body at UCSD), responsible for most of the social events on campus.



### **Q. Do you have any prior experience in student politics?**

**A.** Yes, at the moment I am chairman of the Commuter Board, the Muir College Council body that oversees all of the events for commuters at the college.

### **Q. What's done for commuters at UCSD?**

**A.** Our basic goal is to try to make commuter life as enjoyable as possible for those students who travel to and from the campus each day. We arrange car pools where possible, especially when three or four students live in the same neighborhood and all leave at approximately the same time for class each day. We also represent commuters' interests where campus parking is concerned.

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**Katherine Swan**  
Junior, Warren College

**Q. Are there social activities for commuters?**

**A.** We encourage commuters to come to campus events and meet other students socially. There's a commuter-adoption program that introduces residents to commuters so that the off-campus students may have contacts with people on campus. We also organize special events such as ski trips, hang-gliding expeditions, and hot-air balloon rides for the commuters.

**Q. Why did you get involved with commuter students?**

**A.** I'm just concerned. I'm from Bonita Vista, a suburb of San Diego about forty-five minutes' drive from UCSD. I realized that commuters have special needs. I thought that I should try to take the initiative to help them get involved in the social life of the campus.

**Q. Are you involved with sports?**

**A.** I ran track the first two years that I was here. I played rugby for a time, I am involved in pretty much every intramural sport on campus, and I am also coordinating intramural sports for the residents of Muir College.

*Katherine Fraser Swan is a twenty-year-old junior at the University of California, San Diego. From San Jose, she graduated from Leland High School in the Almaden Valley, in 1984. Kerry, as she is known, had set her sights on one of the schools in the University of California system, and was delighted when she was accepted at UCSD. She had visited the campus only one time prior to the summer orientation week for freshmen. It was during orientation that she became convinced she had made the right choice.*

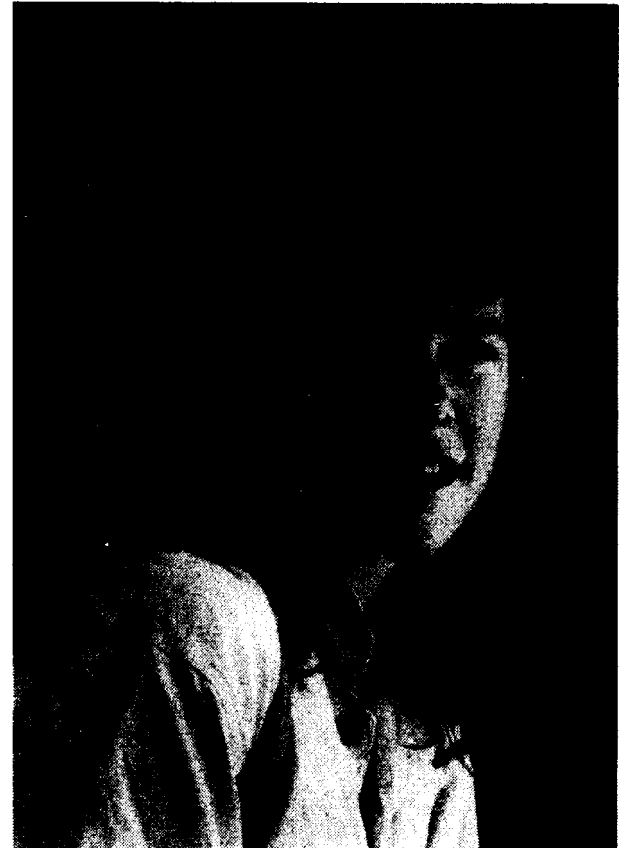
*The four-college system at UCSD enabled Swan to be creative with her course work. She chose Warren College for its dual minor, enabling her to study psychology and a special Warren minor called, "Science, Technology, and Public Affairs" (STPA). Her declared major is management science, in the Department of Economics.*

**Q. What prompted you to choose those minors?**

**A.** Having two minors allows me to take the classes outside of my major that I am really interested in, and skip the ones which have no appeal whatsoever. At one time I considered teaching as a career, so I thought psychology would be helpful. I have always been interested in science, so the courses offered in the STPA curriculum, such as human nutrition, the biology of cancer, the problem of nuclear war, and computers and society, were really interesting to me.

**Q. How did you arrive at management science for a major?**

**A.** I have always had a math mind, so I took the Mathematics 2 sequence, which is a little more advanced than, say, the Math 1 sequence offered by the mathematics department. Then I took an economics class and really enjoyed it. I considered doing a double major of math and economics, but realized that economics became more interesting to me as I continued taking classes. Also, I took a class in the Teacher Education



Program and discovered it was less appealing to me than I thought it would be. Included in my reasoning was the fact that a business career would offer more in salary than a career in teaching.

**Q. Do you have an idea how you will apply the major when you graduate?**

**A.** I really like working with people. For the past two years I have been a resident adviser for the Warren Apartments and have worked on two orientation week committees. I think that combining my people skills with my business skills would be fun. I am seriously considering going to hotel management school.

**Q. What are your responsibilities as a resident adviser?**

**A.** I actually work for the University of California, and I receive room and board in exchange. I am in charge of students living on campus, basically. I plan programs for students who live in the Warren Apartments, such as coffee

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houses and ski trips. I have done work on career nights, inviting alumni back to campus to speak about their jobs. I help to plan Welcome Week, which takes place the week before the fall quarter begins. For Welcome Week last year, I served on the committee, and actually drove the Warren float.

**Q. Are you involved in any other activities on or off campus?**

**A.** Yes. Along with the resident adviser's position and carrying my required sixteen units, I have a job at the Scripps Institution of Oceanography's Marine Physical Laboratory in Point Loma. I am called an engineer aide, and I've been there since my freshman year. I assist the people who are in charge of the budget, doing various tasks on the computer such as writing simple programs, or working with spreadsheet calculator programs and budgets.

**Q. Where did you learn computer programming?**

**A.** During high school I had a job with a computer company in San Jose. I learned the UNIX operating system there, and a little bit of "C" programming.

**Q. You seem to have amassed quite a bit of experience during the past five years. What's in store for the immediate future?**

**A.** Actually, I just got the job as student orientation coordinator for Warren's orientation program. It means I will oversee orientation leaders for the Warren orientation session. I think there will be eight day-and-a-half sessions this year. They will take place during the summer, and every incoming freshman has to attend one. Leaders will take groups of students through the process of signing up for classes, and help them to dispel any fears they may have about coming to UCSD. It's a great program, and it's also a paid position for me. I am also in the process of interviewing next year's resident advisers with the Warren resident dean. I won't be coming back to that position next year, as I will be working expanded hours at the Marine Physical Lab. I was working ten to fifteen hours a week, and those hours will probably double.

**Q. What did you do in your job as resident adviser?**

**A.** Sometimes the job involves five hours a week, and sometimes it requires fifty — that includes the unscheduled fire alarms at two in the morning, and resolving unexpected roommate conflicts. The job is very authoritative, too. If residents are doing something they aren't supposed to be doing, I am required to enforce the university's policies. If someone is having a loud party, I ask him or her to calm it down. That's the hardest, because I even have to do this with my friends. I also have scheduled duty periods where I am required to work in the office to assist people who are lost, or do other kinds of trouble shooting.

**Q. What about your resident adviser position has been the most meaningful?**

**A.** Being a resident adviser has had its share of drawbacks. It's a very time-consuming job and I must always try to set an example, in and around the apartments. For instance, it's a big mistake to attend the parties. I feel as if I've gained personal experience in both my jobs, and with the job as student orientation coordinator I feel I will learn a lot about delegating responsibility and taking direction from the head coordinators. I think I have learned a lot both inside and outside of my classes — almost more outside, because it has been real-life experience, and not just theory from the text.

## **Matt Engler** Senior, Revelle College

*Matt Engler will spend a fifth year at UCSD pursuing his degree in earth sciences. Matt's keen interest in earth exploration began long before he came to college. His father was a geology major in college and Matt's close-knit family engendered an innate respect for each other's areas of interest. For the future, Matt has his sights set on exploration of a different kind. When he graduates in 1988 he is interested in becoming a Navy jet pilot, going to graduate school, or working for NASA.*

### **Q. What would you like to do at NASA?**

**A.** It is a far-fetched goal, but I'm interested in the astronaut program. At this point I haven't looked into it too much. But I do know it's possible. If they can do it, I can do it.

### **Q. Tell me a bit about your background.**

**A.** I'm from Marin, California. I have three brothers, no sisters. We have a pretty tight family, pretty boisterous. If you come to dinner at our house the first thing that hits you is how noisy it is. We all like to talk and we all joke around.

I was a 3.0 out of high school, which, in terms of going to college, isn't quite what you want. I had just as much smarts as anyone else; I just didn't have the motivation. After high school I worked for a year. I guess in that year off I got everything together. I worked as the assistant manager of a restaurant and I stagnated after about five months. So I just decided that I had to be motivated to make something of my life. From then on I knew I really wanted to be at college, so I had a jump on some of the people right out of high school. I was excited just to be at college.

### **Q. You didn't know anybody at UCSD when you started. Was that difficult?**

**A.** I knew I would be living with the people in my dorm for the rest of the year. I decided I had to go out and make



friends. That was easy to do. We got to know each other real well and became a tight suite. We're still very good friends. Being associated with a college gives you a bit more of a sense of community. It makes college seem a little bit smaller and less frightening. It gives you something else to be proud of. And sometimes it provides some healthy competition.

### **Q. How would you describe Revelle College?**

**A.** I'd say most Revelle students are pretty highly motivated people. It seems that Revelle students have their goals in sight by the end of the second year. But they don't forget about some of the lighter aspects of life. They know how to have a good time and how to balance their social life. They know how to get a lot of things done.

### **Q. Why did you choose earth sciences?**

**A.** My father was a geology major, so I grew up with an interest in the earth. Without knowing it, I absorbed some of his enthusiasm for the earth sciences. I

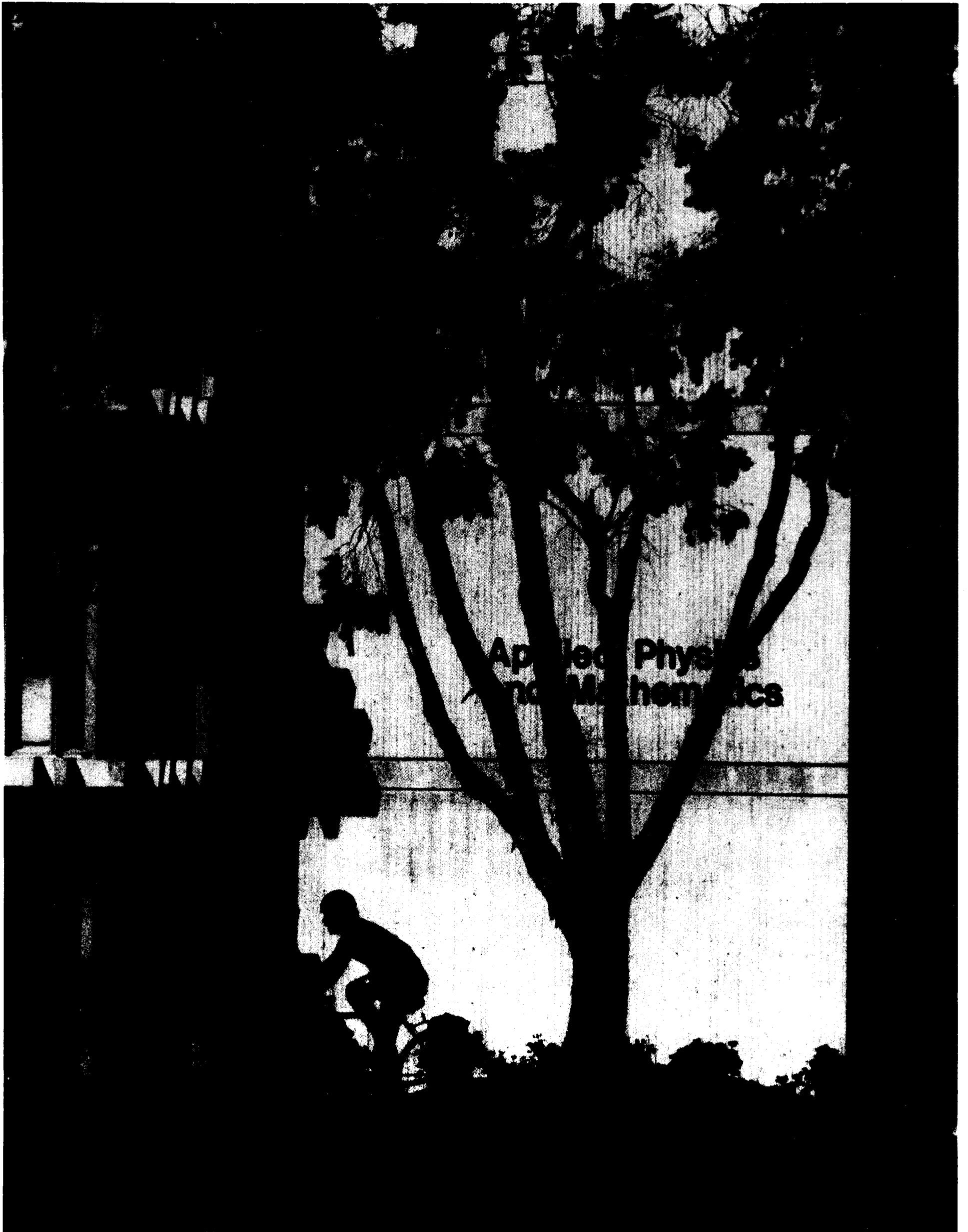
also found out that the UCSD earth sciences program, which has a higher concentration of physics and math than traditional programs, enhanced my prospects for graduate school admission. Everyone says it's a hard major. It's a lot of work. I'm not discrediting it or trying to make myself look smarter by saying that it's pretty easy. But my interest has always been in life in space, astronomy, and that sort of thing. It comes naturally then because the interest is there. I think the people who have problems are the ones who don't have an interest in their areas of study.

### **Q. Now you're a resident adviser at Revelle. What does that involve?**

**A.** Basically, I'm responsible for enforcing the policies of the dorm — which is the hardest aspect of the job. We also program a lot of events to try to help residents balance their social life with their studies. We provide counseling and keep a watchful eye for students who may be having problems and may need someone to talk to.

### **Q. What advice do you give new students?**

**A.** Balance your academic and your social time. You don't need to spend all of your free time studying because you need a social life. Get involved, because that is how you meet people. I'd have to say at first it looks like you are never going to get through it all in terms of the classes, requirements, and college, period. But if you don't look at it as one big wall you have to overcome but as a lot of little barriers, and just take them one by one, you will get there. You are not going to get straight A's as you did in high school. You are not going to do incredibly well every quarter. There are going to be some ups and some downs. But that's one thing that I like about college. In high school, if you're an average student you seem to stay an average student, but in college it changes every quarter.



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# UNDERGRADUATE ADMISSIONS, POLICIES AND PROCEDURES

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All communications concerning undergraduate admission should be addressed to the Office of Admissions, Q-021A, University of California, San Diego, La Jolla, California 92093.

## DEFINITIONS

An application to the University of California, San Diego is processed and evaluated as a freshman or transfer, California resident; freshman or transfer, nonresident; or freshman or transfer, international applicant. See definitions below:

### An Undergraduate Applicant

A student who wishes to complete a program of studies leading to a bachelor of arts or a bachelor of science degree.

### A Freshman Applicant

A student who has graduated from high school but who has not enrolled since then in a regular session in any collegiate-level institution. This does not include attendance at a summer session immediately following high school graduation.

### A Transfer Applicant

A high school graduate who has been a registered student in another college or university or in college-level extension classes other than a summer session immediately following high school graduation. A transfer applicant may not disregard his or her college record and apply for admission as a new freshman.

An undergraduate student can earn transfer credit upon successful completion of college-level work which the university considers consistent with courses it offers. Such credit may be earned either before or after high school graduation. The acceptability of courses for transfer credit is determined by the Office of Admissions.

### A Nonresident Applicant

A student who lives outside the state of California and who is required to present a higher scholarship average than is required of California residents to be eligible for admission to the university, in addition to paying the nonresident tuition fees.

### An International Applicant

A student who claims citizenship in another country and has a nonimmigrant visa.

### Early Admission Honors

Through this program, a very few specially qualified students in local high schools are admitted to UCSD. Beginning in the fall, they attend one or two classes at UCSD during their senior year in high school at reduced cost. For additional information call or write:

Office of Relations with Schools, B-037, UCSD, La Jolla, California 92093, (619) 534-4831.

## EDUCATIONAL OPPORTUNITY PROGRAM/ STUDENT AFFIRMATIVE ACTION

The Educational Opportunity Program (EOP) and the Student Affirmative Action Program (SAA) are admission recruitment and academic support programs established by the university to increase the enrollment of educationally disadvantaged and low-income students. Students are provided with pre-admission counseling, academic and personal support services. EOP eligibility is based on a combination of family income level and parental educational background. SAA focuses on underrepresented minority students who are black, Mexican American, American Indian, Latino, or Filipino with no consideration of family income or parental educational level.

Services available to EOP/SAA students cover a broad range of needs. Recruitment, admissions, and application-related

services include visits to high schools and community colleges, pre-admission counseling, application fee waivers, application follow-up, deferral of the Statement of Intention to Register fee, special action admission consideration and extended application deadlines (SAA only). Other support services include referrals to obtain campus housing and financial aid counseling. Academic support for EOP/SAA students is offered through the Office of Academic Support and Instructional Services (OASIS). OASIS sponsors summer bridge (a summer residential program) and peer counseling. OASIS also gives priority for individual tutoring to EOP/SAA students and offers a variety of academic skills workshops and cross-cultural programming.

Prospective EOP/SAA students should obtain a UC undergraduate application packet from any high school or community counselor or directly from UCSD. All EOP applicants must be California residents with the exception of American Indians. SAA applicants do not have to be residents of California. To be considered for SAA, complete the ethnic identity information entry on the application. If your ethnic identity is black, Mexican American, American Indian, Latino or Filipino you will be included in the Student Affirmative Action program. To apply for EOP, fill in the ethnic identity information and the information requested in the application pertaining to family size and income, parental education level and occupation. This information is used in conjunction with other information from the admissions application in determining eligibility for EOP.

Application Checklist:

1. File a UC Undergraduate Admissions Application (include appropriate fee amount; fee waivers are available in hardship cases).



## UNDERGRADUATE ADMISSIONS

2. Include the required autobiographical essay of personal information covering your family background (i.e., education, size, employment, etc.) and any special circumstances. The essay should give your reasons for applying to EOP/SAA and should also elaborate on your career goals and personal interests.
3. Request to have official academic transcripts from your high school and all colleges you have attended forwarded to the UCSD Office of Admission.
4. Provide two letters of recommendation from teachers and/or counselors familiar with your academic background, potential, motivation, or special circumstances.
5. If you are a freshman applicant, you must also submit aptitude test scores from either the American College Test (ACT), or the Scholastic Aptitude Test (SAT). Additionally, scores must be reported from three College Board Achievement Tests (ACH), including one each in English composition, mathematics, and one test in either English literature, foreign language, a science, or social studies.

Financial aid is available to eligible EOP/SAA students from the regular state, federal, and university sources administered through the UCSD Financial Services Office. Although EOP eligibility does not guarantee financial aid, the low income ceilings for EOP eligibility mean that most EOP applicants should qualify for substantial financial awards. Financial aid information is available from the UCSD Student Financial Services Office. Pre-application assistance should be sought from your high school or community college counselor as well as from the EOP/SAA Office. For additional information about EOP/SAA eligibility requirements, program services, or general information regarding UCSD, call or write:

EOP/SAA Office, B-037  
University of California, San Diego  
La Jolla, CA 92093  
(619) 534-4831



## UNDERGRADUATE COLLEGES AND MAJORS

Even though you may be uncertain about your major, your application for admission must include the name of the UCSD college with which you plan to affiliate (Revelle, Muir, Third, or Warren). You should indicate a second or third choice in the event your first choice college closes early. Applicants may be reassigned to another college by the Admissions Office if enrollment quotas prohibit first choice. Applicants who do not indicate a UCSD college preference will be assigned a college.

In the "Choosing a College" section, which describes the educational philosophies of the four colleges at UCSD, you will find information concerning the requirements of each college. It is very important that you read that section of the catalog carefully, and that you decide which of the colleges is the right one for you.

Although you may be accepted to the college of your choice, if openings are available, you may have to pass specific courses with grades of a given level to become a degree candidate in your preferred major. This set of conditions, determined on a department-by-department

basis, and approved by the San Diego Committee on Educational Policy, is explained in detail under the department listing in this catalog.

As of the printing of this catalog the Departments of Applied Mechanics and Engineering Sciences, Computer Science and Engineering, Electrical and Computer Engineering, Mathematics-Computer Science, and Communication are screening admissions to the major. Other departments, however, may be approved by the Committee on Educational Policy subsequent to this publication. Under such conditions, you will be admitted as a pre-major until specific prerequisites are satisfied.

Please refer to "Major Fields of Study" in the introduction to the catalog.

## UNDERGRADUATE ADMISSIONS

The university's undergraduate admission requirements, which are the same on all University of California campuses, are based on three principles. Simply stated, they are: (1) The best predictor of success in the university is high scholarship in previous work; (2) The study of certain



subjects in high school gives a student good preparation for university work and reasonable freedom in choosing an area for specialized study; (3) Standardized aptitude tests provide a broad base for comparison, and mitigate the effects of differing grading practices.

You should understand that the academic requirements for admission are minimum entrance standards. Completing the required high school courses with satisfactory grades will not automatically determine whether you will be selected for admission to UCSD, as students are chosen from a large number of highly competitive applicants. Most of these applicants will have met more than the minimum requirements; thus selection depends on additional factors.

You should take as many honors and advanced placement courses as possible and should try to exceed the minimum academic subject requirements in all subjects, particularly mathematics, laboratory sciences, and foreign languages. High test scores are necessary in conjunction with strong performance in classes and a consistent pattern of courses. Overall performance must be well above average in order to admit you to the campus and major of your choice.

NOTE: The admission requirements discussed here are for the 1987-88 academic year.

## ADMISSION AS A FRESHMAN APPLICANT: Effective Fall Quarter 1987

To be eligible for admission to the university as a freshman you must meet the high school diploma requirement, the subject requirement, the scholarship requirement, and the examination requirement, which are described below.

### High School Diploma Requirement

You must have a diploma from a high school in order to enter the university as a freshman. The Certificate of Proficiency, awarded by the California State Department of Education upon successful completion of the High School Proficiency Examination, proficiency tests from other states, and the General Education Development (GED) certificate, will be accepted in lieu of the regular high school diploma.

Subject, scholarship, and examination requirements discussed below must also be met.

### Subject Requirement

A student applying for admission as a freshman to the University of California must have completed a minimum of sixteen units of high school work during grades nine through twelve. (A one-year course is equal to one unit; a one-semester course is equal to one-half unit.)

Fifteen of these required units must have been earned in academic or college preparatory courses, as specified and defined below. Also, at least seven of the fifteen units must have been earned in courses taken during the last two years of high school.

#### Specific "a-f" Course Requirements

**a. History: 1 unit**

One year of United States history, or one-half year of United States history and one-half year of civics or American government, taken in the ninth grade or later.

**b. English: 4 units**

Four years of college preparatory English — composition and literature. (All English courses must require frequent and regular practice in writing expository prose compositions of some length. Also, not more than two semesters of ninth-grade English will be accepted for this requirement.)

**c. Mathematics: 3 units**

Three years of mathematics — elementary algebra, geometry, and intermediate algebra. (Mathematics courses taken in grades seven and eight may be used to meet part of this requirement if they are accepted by the high school as equivalent to its own courses.)

**d. Laboratory Science: 1 unit**

A year course in one laboratory science, taken in the tenth grade or later.

**e. Foreign Language: 2 units**

Two years of one foreign language in courses that provide instruction in grammar, vocabulary, reading, and composition, and that emphasize the development of aural and oral skills.

**f. College Preparatory Electives: 4 units**

Four units in addition to those required in a. through e. above, to be chosen from at least two of the following sub-

ject areas: history, English, advanced mathematics, laboratory science,\* foreign language, social science, and fine arts. (In general, elective courses should involve considerable reading and should aim to develop a student's analytical and reasoning ability and skill with written and oral exposition.)

\* A general science course taken in the ninth grade as preparation for a laboratory science course is an acceptable elective. However, the course cannot be used to satisfy the "d" requirement.

### Courses Satisfying the "f" Requirement

*History and English* Elective courses that fit the general description in "f" above are acceptable.

*Advanced Mathematics* Trigonometry, linear algebra, precalculus (mathematical analysis), calculus, statistics, computer science, and similar courses are acceptable. Courses containing significant amounts of material from arithmetic or from shop, consumer, or business mathematics are not acceptable.

*Laboratory Science* Courses in the biological and physical sciences are acceptable.

*Foreign Language* Elective courses may be in either the same language used to satisfy the "e" requirement or in a second foreign language. If a second language is chosen, however, at least two years of work in that language must be completed.

*Social Science* Elective courses that fit the general description in "f" above are acceptable. In addition, these courses should serve as preparation for lower-division work in social science at the university. Courses of an applied, service, or vocational nature are not acceptable.

*Fine Arts* Elective courses in fine arts should enable students to understand and appreciate artistic expression, and to talk and write with discrimination about the artistic material studied. Courses devoted to developing creative artistic ability and courses devoted to artistic performance are acceptable. Courses that are primarily recreational or are offered under physical education are not acceptable.

### Honors Level Courses

The University of California encourages students to take demanding advanced academic courses in all fields. Accordingly, for students graduating from high school in 1984 or thereafter, the grades in up to four units taken in the student's last two years of high school will be counted on a scale A = 5, B = 4, C = 3, if these courses are certified by the high school and the University of California as offered at an honors level. These courses must be in the areas of history, English, advanced mathematics, laboratory science, and foreign language.

### Examination Requirement

All freshman applicants must take and submit scores from tests specified below. If you are applying for admission to the fall term, you should take the tests by November of your senior year.

1. One aptitude test, either a or b:
  - a. Scholastic Aptitude Test (SAT)

Your verbal and mathematics scores on this test must be from the same sitting.

- b. American College Test (ACT)  
The composite score will be reported.
2. Three College Board Achievement Tests (ACH)  
These must include (a) English Composition; \* (b) Mathematics, Level 1 or 2; and (c) one from English literature, foreign languages, sciences, or social studies.

If tests are repeated, the university will accept the highest score received. The best SAT test is a total score of the math and verbal taken at the same sitting. See your counselor for information and registration forms or write to the College Entrance Examination Board (SAT), P.O. Box 1025, Berkeley, California 94701. For ACT information, write to the ACT Program, P.O. Box 168, Iowa City, Iowa 52243.

\*The Achievement Test in literature may not be substituted.

### Freshman Eligibility: California Residents

(Refer also to "Admission as a Freshman Applicant.")

**Eligibility Index:** An "Eligibility Index" is used to select California applicants. If you make a perfect score on the SAT (1600) or the ACT (35) you need a GPA of only 2.78 to be eligible for admission. On the other hand, if you have a GPA of 3.30 or better, you are eligible even with the lowest test scores. Between these extremes, the following table is used. If you know your GPA (using the best grades earned in grades ten, eleven, and twelve to meet minimum requirements in the "a through f" pattern) the table will show the required test score; conversely, if you know your SAT total or your ACT composite, the table will show the required GPA.

#### Eligibility by Examination Alone:

If you do not meet the scholarship and subject requirements for admission, you can qualify for admission as a freshman

**Table of Grade-Point Averages and Corresponding Required Test Scores**

| A-F GPA | ACT* COMPOSITE | SAT** TOTAL | A-F GPA | ACT* COMPOSITE | SAT** TOTAL |
|---------|----------------|-------------|---------|----------------|-------------|
| 2.78    | 35             | 1600        | 3.04    | 23             | 990         |
| 2.79    | 35             | 1580        | 3.05    | 22             | 970         |
| 2.80    | 34             | 1550        | 3.06    | 21             | 950         |
| 2.81    | 34             | 1530        | 3.07    | 21             | 920         |
| 2.82    | 33             | 1510        | 3.08    | 20             | 900         |
| 2.83    | 33             | 1480        | 3.09    | 19             | 880         |
| 2.84    | 33             | 1460        | 3.10    | 18             | 850         |
| 2.85    | 32             | 1440        | 3.11    | 18             | 830         |
| 2.86    | 32             | 1410        | 3.12    | 17             | 810         |
| 2.87    | 32             | 1390        | 3.13    | 16             | 780         |
| 2.88    | 31             | 1370        | 3.14    | 15             | 760         |
| 2.89    | 31             | 1340        | 3.15    | 14             | 740         |
| 2.90    | 30             | 1320        | 3.16    | 14             | 710         |
| 2.91    | 30             | 1300        | 3.17    | 13             | 690         |
| 2.92    | 29             | 1270        | 3.18    | 12             | 670         |
| 2.93    | 29             | 1250        | 3.19    | 11             | 640         |
| 2.94    | 28             | 1230        | 3.20    | 10             | 620         |
| 2.95    | 28             | 1200        | 3.21    | 9              | 600         |
| 2.96    | 27             | 1180        | 3.22    | 9              | 570         |
| 2.97    | 27             | 1160        | 3.23    | 8              | 550         |
| 2.98    | 26             | 1130        | 3.24    | 8              | 530         |
| 2.99    | 26             | 1110        | 3.25    | 7              | 500         |
| 3.00    | 25             | 1090        | 3.26    | 7              | 480         |
| 3.01    | 25             | 1060        | 3.27    | 6              | 460         |
| 3.02    | 24             | 1040        | 3.28    | 6              | 430         |
| 3.03    | 24             | 1020        | 3.29    | 5              | 410         |
|         |                |             | 3.30    | 5              | 400         |

\*ACT is scored in intervals of 1 point from a minimum of 1 to 35 maximum.  
\*\*SAT is scored in intervals of 10 points from a minimum of 400 to 1600 maximum.

by examination alone. To do so, you must earn 1100 on the SAT or 26 on the ACT. Your total score on the three Achievement Tests must be 1650 or higher with no area score less than 500.

Applicants who have completed fewer than twelve transferable college units since graduation may qualify for admission by examination alone. (Note: if you have completed transferable college courses, CEEB Achievement tests cannot be taken in academic subjects covered in those courses.)

### **Freshman Eligibility: Non-California Residents**

(Refer also to "Admission as a Freshman Applicant.")

**Scholarship:** An applicant who is not a resident of California is eligible for admission to the university with a grade-point average of 3.40 or better, calculated on the required high school subjects. These subjects, referred to as "a through f," are the same for the nonresident as for the resident. (The "Eligibility Index" applies to the California applicant only.)

**Eligibility by Examination Alone:** If you do not meet the scholarship and subject requirements for admission, you can qualify for admission as a freshman by examination alone. To do so you must earn 1100 on the SAT or 26 on the ACT. Your total score on the three Achievement Tests must be 1730 or higher with no area score less than 500.

Applicants who have completed fewer than twelve transferable college units since graduation may qualify for admission by examination alone. (Note: if you have completed transferable college courses, CEEB Achievement tests cannot be taken in academic subjects covered by those courses.)

### **Additional Preparation for University Work: Freshman Applicants**

High school courses required for admission to the university are listed at the beginning of this section. This list is in no way intended to constitute an outline for a valid high school program. The courses listed were chosen largely for their value as predictors of success in the university. These required courses add up to ten "Carnegie" units, while graduation from high school requires from fifteen to nine-

teen. Courses beyond our requirements should be chosen to broaden your experience in such fields as social sciences and the fine arts, and should fit in with your personal plans for the future.

A science major, for example, besides taking courses in chemistry, physics and biology, will find more than three years of mathematics essential. A science major without a working knowledge of trigonometry and at least intermediate algebra is likely to be delayed in getting a degree. If you have an interest in languages or plan a college program with a foreign language requirement, you should have completed more than the two years of foreign language needed for admission.

You should understand that the "a through f" requirements for admission are *minimum entrance standards*. Completing the required high school courses with satisfactory grades will not automatically prepare you for freshman work in every subject, much less in your major or program of study. Many entering students discover to their dismay that they are not adequately prepared for basic courses, such as English composition and calculus, which they are expected to take in their freshman year. Also, many undergraduate majors, particularly those in sciences and mathematics, require more high school preparation than that necessary for admission. This lack of preparation can cause problems for students who do not choose a major until after they enter the university, or for those who prepare for one major but later decide to change to another.

For these reasons, you should take courses that will prepare you beyond minimum levels of competence in reading, writing, and mathematics. A student who is well-prepared for university work will have taken four years of English in high school, four years of mathematics, two to three years of foreign language, two to three years of laboratory science, one year of history, and one or more years of art or humanities.

**Reading** Many students are not prepared for either the kinds or amounts of reading demanded of freshmen at the university. You should become proficient in reading and understanding technical materials and scholarly works. You should learn to read analytically and critically, actively questioning yourself about the author's intentions, viewpoint, arguments, and conclusions. You should also become familiar and comfortable with the conven-

tions of standard written English and with various writing strategies and techniques. Your reading experience should include original works in their entirety, not just textbooks and anthologies, and should encompass a wide variety of forms and topics.

**Writing** Effective critical thinking and proficiency with the written language are closely related, and both are skills which every university student must master. By university standards, a student who is proficient in English composition is able to (a) understand the assigned topic; (b) select and develop a theme by argument and example; (c) choose words which aptly and precisely convey the intended meaning; (d) construct effective sentences, i.e., sentences that economically and successfully convey the writer's ideas and display a variety of structures; (e) demonstrate an awareness of the conventions of standard written English, avoiding such errors as sentence fragments, run-together sentences, faulty agreements, and improper pronoun references; and (f) punctuate, capitalize, and spell correctly.

If you plan to attend the university, you must take English courses in high school that require the development and practice of these skills. You must take at least four years of English composition and literature that stress expository writing; the development of persuasive critical thinking on the written page.

**Mathematics** Many undergraduate majors require preparation in mathematics beyond that necessary for admission to the university. All majors in the natural and life sciences, engineering, and mathematics require calculus. Many majors in the social sciences require statistics or calculus, sometimes both. If you have selected a major that requires either calculus or statistics you should expect to take that course during your freshman year at the university.

Calculus is also required for undergraduates preparing for careers in environmental sciences, dentistry, medicine, optometry, pharmacy, and biostatistics. Many students are not aware of the large number of fields outside the natural and mathematical sciences which require calculus or statistics as prerequisites.

You should prepare yourself for university courses in calculus while you are still in high school. In addition to the two years of mathematics required for admission,

you should take a second year of algebra and a year of precalculus mathematics. These courses should include: (a) basic operations with numerical and algebraic functions; (b) operations with exponents and radicals; (c) linear equations and inequalities; (d) polynomials and polynomial equations; (e) functions and their graphs; (f) trigonometry, logarithms, and exponential functions; and (g) applications and word problems. Students who plan to enter a field which requires statistics should take at least the second year of algebra.

If you are not proficient in basic and intermediate algebra, you will be at an enormous disadvantage in the university. You will have to take one or more precalculus courses before beginning calculus and may also have to take preparatory courses before beginning statistics. The necessity to take these preparatory courses could seriously delay your undergraduate studies.

For more detailed information on recommended high school courses, ask your counselor to show you a copy of the university-wide publication *Prerequisites and Recommended Subjects*.

### College Credit: Freshman Applicants

There are many steps you can take to earn credit which will be applicable to your graduation from college. Some of these steps may be taken even before you graduate from high school. Among them are the following:

#### College Courses

Many high schools have arrangements with nearby postsecondary institutions, allowing you to take regular courses while you are still in high school. These courses are accepted by the university exactly as they would be if you were a full-time college student.

No matter how many college units you earn before graduating from high school, you still apply as a freshman.

#### Advanced Placement

The Advanced Placement Examinations of the College Entrance Examination Board are taken, usually during the senior year, in conjunction with courses taken in high school. You will receive ten quarter-units of university credit for most examinations in which you earn a score 5, 4, or 3.

These credits will apply toward the total required for graduation from the university. See the Advanced Placement chart which appears later in this section.

### ADMISSION AS A TRANSFER APPLICANT

The university defines a transfer applicant as a high school graduate who has been a registered student in another college or university or in college-level extension classes other than a summer session immediately following high school graduation. A transfer applicant may not disregard his or her college record and apply for admission as a new freshman.

#### Transfer Requirements Effective Fall 1989

**Transfer students applying for admission for fall 1989** will have to satisfy the freshman admission requirement in mathematics that became effective fall 1986, that is *three* years of mathematics.

#### Scholarship Requirement

The requirements for admission as a transfer student vary according to your high school record.

#### Determining Your Grade-Point Average

Your grade-point average is determined by dividing the total number of acceptable units you have attempted into the number of grade points you earned on those units. You may repeat courses that you completed with a grade lower than C up to a maximum of sixteen quarter-units without penalty. Only the grade earned in the repeated course will be included in the grade-point average.

The scholarship standard is expressed by a system of grade points and grade-point averages earned in courses accepted by the university for advanced-standing credit. Grade points are assigned as follows: for each unit of A, 4 points; B, 3 points; C, 2 points; D, 1 point; and F, no points.

#### Credit from Another College

The university gives unit credit to transfer students for courses they have taken at other colleges and universities, including some extension courses. To be accepted

for credit, the courses must be consistent with those offered at the university, as determined by the Office of Admissions. Applications from students who appear to have more than 135 quarter-units (90 semester-units) of transfer credit will be reviewed for approval by the UCSD college to which they applied.

Many students who plan to earn a degree at the university find it to their advantage to complete their freshman and sophomore years at a California community college. Each community college offers a full program of courses approved for transfer credit. A student may earn 105 quarter-units (70 semester-units) toward a university degree at a community college. Subject credit for courses taken in excess of those units will be granted.

The transferability of units from California community colleges and all other postsecondary institutions proceeds as follows: (1) transferability of units is decided by the systemwide administration of the University of California, and these decisions are binding upon all UC campuses; (2) applicability of transferred units to breadth (general-education) requirements is decided for each UCSD college by its provost; (3) applicability of units toward the major is decided by the appropriate UCSD department. Before applying to UCSD you may obtain more information on many of these matters from the Office of Relations with Schools.

Applicants who have completed courses at a postsecondary institution outside the U.S.A. should contact the foreign credential evaluator. Advanced standing credit for appropriate courses will be decided on an individual basis.

NOTE: The University of California does not give credit for CLEP examinations.

#### Transfer Eligibility: California Resident

As a transfer applicant you must meet one of the requirements described below for admission to the university.

1. If you completed all the "a-f" courses in high school and achieved the required score on the Eligibility Index, you may be admitted to the university any time after you have established a grade-point average of 2.0 or better in transferable college courses.

If you have completed fewer than twelve quarter- or semester-units of transferable college credit since high

school graduation, you must also satisfy the Examination Requirement for freshman applicants. See "Examination Requirement."

2. If you achieved the required score on the Eligibility Index but did not complete all the "a-f" subjects in high school, you may be admitted to the university after you have:
  - a. Established a college grade-point average of 2.0 or better; *and*
  - b. Completed, with grades of C or better, appropriate college courses in the "a-f" subjects you lacked; *and*
  - c. Completed twelve or more quarter- or semester-units of transferable college credit, or have met the Examination Requirement for freshman applicants.
3. If you did not achieve the required score on the Eligibility Index, or did not achieve the required score and lacked required "a-f" subjects, you may be admitted to the university after you have:
  - a. Established a college grade-point average of 2.4 or better in transferable courses; *and*

- b. Completed eighty-four quarter- or fifty-six semester-units of transferable college credit; *and*
- c. Completed *one* of the following:
  - (1) Appropriate college courses, with grades of C or better, in the "a-f" subjects you lacked. Up to two units of high school work in "a-f" subjects will be waived, but transfer applicants must have satisfied the freshman admission requirements in English and mathematics. A unit is equivalent to a one-year course; *or*
  - (2) One college course in mathematics, one in English, and one in either U.S. history, a laboratory science, or a foreign language, all with grades of C or better.

The course in mathematics must be equivalent to two years of high school algebra (elementary and intermediate) or one year of algebra (elementary) and one year of geometry. All of the other courses described above must be transferable to the university.

### Transfer Eligibility: Non-California Residents

If you met the admission requirements for freshman admission as a nonresident, you will be eligible if you have a GPA of 2.8 or higher in college courses that are accepted by the university for transfer credit.

If you were ineligible from high school only because you did not study one or more of the required subjects, you may be admitted to the university after you have:

1. Established an overall grade-point average of 2.8 or better in another college or university;
2. Completed, with a grade of C or better, appropriate college courses in the high school subjects you lacked; *and*
3. Completed twelve or more quarter- or semester-units of transferable credit, or have met the examination requirement.

If you are a nonresident applicant who graduated from high school with less than a 3.4 grade-point average in the "a through f" subjects required for freshman admission, you must have completed at least eighty-four quarter-units (fifty-six semester units) of transferable work with a grade-point average of 2.8 or better. In addition, if you lacked any of the required subjects in high school, you must have completed the following:

1. Appropriate college courses, with a grade of C or better, in high school subjects you lacked. Up to two units of high school work in "a-f" subjects will be waived, but transfer applicants must have satisfied the freshman admission requirements in English and mathematics. A unit is equivalent to a one-year course; *or*
2. One college course in mathematics; one in English; and one in either U.S. history, a laboratory science, or a foreign language, all with grades of C or better.

### International Applicants

Applicants who present evidence of above-average scholarship achievement will be considered for admission.

Courses at UCSD are conducted in English, and every student must have sufficient command of that language to benefit from instruction. To demonstrate such command, students whose native language is not English will be expected





to take the Test of English as a Foreign Language (TOEFL). Arrangements for taking this test may be made by writing to the Educational Testing Service, P.O. Box 899, Princeton, New Jersey 08540. The minimum TOEFL score which will be acceptable is 550.

The results of this test will be used to determine whether the applicant's command of English is sufficient to enable him or her to pursue studies effectively at UCSD. Foreign students whose command of English is slightly deficient will be required to take an English course and, therefore, a reduced program.

In addition to an adequate English-language background, foreign students must have sufficient funds available to cover all fees, living, and other expenses, and transportation connected with their stay in the United States (see "Fees and Expenses").

Foreign students are required to obtain health insurance for themselves and dependents who accompany them. Suitable insurance policies and additional information are available at the Student Health Service and at the International Center.

### Second Baccalaureate/and Limited Status Applicants

Applications received by the Office of Admissions from students who have earned a four-year degree will be reviewed by the college provost's office. Limited status (non-degree-seeking) applicants and those seeking a second B.A. or B.S. will be held to the same restrictions as are other new admits; fields that have been closed for admission (such as engineering) will be closed to these students as well. Students will be screened according to the amount of space available in the college; students will also be screened by any departments that have such screening mechanisms for entrance into the major. Students are accepted on an individual basis, and there is no guarantee of admission to the college or to a particular major. Applicants for a second B.A. or B.S. will have **limited status** until such time as they have met the prerequisites to the major and have filed an approved program with the college. Limited status students, with the exception of those in the Teacher Education Program who have the right to appeal, are not awarded on-campus housing.

Limited status students are eligible to apply for a Guaranteed Student Loan if they have not exceeded the duration limit of eighteen quarters of postsecondary attendance. Academic transcripts will be required from all institutions attended *prior* to student financial services certifying of the application. Limited status students in the Teacher Education Program may be eligible for other types of funding if they have not exceeded their eligibility for those programs, since they have been admitted into a certificate program which may qualify them for other Title IV funding.

### HOW TO APPLY FOR ADMISSION

Undergraduate admissions application packets are available from California high school and community college counselors or from any UC campus admissions office. A special application is available for international students. Complete the Undergraduate Application form in this packet. Follow the accompanying directions carefully and mail to:

University of California  
P.O. Box 6600  
Albany, CA 94706-0600

A preaddressed envelope is provided with the application.

You may apply to as many as eight campuses of the University of California on one application form.

### Application Fees

The basic application fee of \$35 entitles you to be considered at one campus of the university. For each additional campus you select, you must pay an extra \$20 fee per campus. These fees are not refundable.

### When to Apply for Admission

To make sure that you will be considered for admission to the university campus(es) you want to attend, and to the major or program of study you want to pursue, file your completed application during the applicable Priority Filing Period (see below).

Each campus of the university accepts for consideration all applications it receives during this period. If you plan to apply for financial aid, university housing, or other special programs where early application is important, you should also file during this time.

### Priority Filing Periods

**All UC Campuses, Except Berkeley**  
**Fall Quarter 1987:**

**File November 1-30, 1986**

**Winter Quarter 1988:**

**File July 1-31, 1987**

**Spring Quarter 1987:**

**File October 1-31, 1987**

**UC Berkeley Only**

**Fall Semester 1988:**

**File November 1-30, 1987**

**Spring Semester 1989:**

**File July 1-31, 1988**

After the priority period has ended, campuses will accept applications *only* if they still have openings for new students. This means that some campuses may be able to accept additional applications, but others may not. If a campus is closed to new students, applicants will be informed that their applications will not be forwarded to that campus. In this case, a portion of the application fee may be refunded if appropriate.

### Adding a Campus

If, after submitting your application, you wish to add a campus or campuses to the one(s) you first listed on your application, you may do so if the campus or campuses you are considering are still accepting applications. Please contact the Admissions Office on each of these campuses for information on which programs are still open and the procedures for adding campuses.

### Selecting Campuses and Programs of Study

You are encouraged to approach the selection of a university campus or campuses and a program of study very carefully. You may be familiar with only one or two of the university's eight general campuses, probably those nearest to your home or mentioned more frequently in the news. You should seriously consider the many different educational alternatives and programs offered by other campuses of the university before completing your application. Your counselor and the university staff in Admissions and Relations with Schools offices can provide you with helpful insights that will help you in the selection process.

## College Choice

The application to San Diego must include a choice of college (Muir, Revelle, Third, or Warren) before it can be completely processed. Selecting an alternate college choice is also advisable since each college has enrollment quotas that limit the number of new freshmen and new transfer students. The Admissions Office will select an alternate college if the first choice is not indicated or available.

## Transcripts

Every applicant is responsible for requesting that the high school of graduation and each college he or she has attended send official transcripts promptly to the Office of Admissions.

If you are still attending high school, you must arrange to send a final official transcript immediately upon completion that includes final grades and date of graduation, or, if you have passed the High School Proficiency Examination, a verification of your Certificate of Proficiency. If you have completed any college courses while in high school, transfer credit may be granted upon receipt of the college transcript.

If you are applying for admission as a transfer student, the Office of Admissions requires official transcripts from your high school of graduation, from each college you have attended, and a preliminary transcript from your present college, with not more than one term still to be completed, listing your work in progress.

The transcripts and other documents that you submit as part of your application become the property of the university; they cannot be returned to you or forwarded in any form to another college or university.

### CHECKLIST FOR APPLICANTS:

1. Fill out the application form completely. Be sure to choose a college in order of preference. Be sure to sign the form.
2. Complete your personal essay and include with the application.



3. Mail application during the filing periods with fee (check or money order payable to The Regents of the University of California) to:  
University of California  
P.O. Box 6600  
Albany, CA 94706-0600
4. Arrange to take the ACT or SAT test and CEEB Achievement tests if you are a freshman applicant **no later than November**.
5. Request that your school(s) send transcripts and other required documents to the UCSD Office of Admissions.
2. Request that any outstanding transcripts be forwarded to the Office of Admissions to ensure full matriculation.
3. Complete and return to the Office of Admissions the Statement of Intention to Register and the Statement of Legal Residence.

## Intention to Register

Upon receipt of your Statement of Intention to Register (SIR), the Office of Admissions provides information to various campus offices including financial aids, housing, and your college provost. You will then receive additional information from each of these offices. The \$50 nonrefundable fee accompanying your SIR is applied toward payment of the university registration fee the quarter for which you have been admitted.

## ADMISSION

The length of time before notification of admission varies. In general, most applicants for the fall quarter will receive final notification by late spring. Applicants for winter and spring quarters are notified as soon as possible following receipt of all appropriate transcripts. In the case of transfer applicants, determination of eligibility cannot be made with more than one term still to be completed.

After receipt of notification of admission:

1. Read your admit letter carefully, noting any special provision governing your admission.



## College Orientation and Registration of New Students

Prior to the quarter for which they have been admitted, new students will receive information from their colleges regarding orientation and enrollment in classes. Students admitted in the fall quarter will be invited to attend a new student orientation on the campus during the preceding summer. Academic advising and enrollment in courses will take place during orientation sessions.

## Student Health Requirement

Entering students are required to complete a Medical History form and to send it to the Student Health Center. Forms and complete instructions are usually sent to entering students well in advance of registration, or they may be obtained at the Student Health Center. Information submitted to the Student Health Service is

kept confidential and is carefully reviewed to help provide individualized health care. Students are urged also to submit a physical examination form completed by their family physician, particularly if they plan to take part in intercollegiate athletic competition. Routine physical examinations are not provided by the Student Health Service. An optional student health plan that provides additional benefits off campus may be purchased at the time registration fees are paid. Student health insurance is mandatory for foreign students and is a condition of enrollment.

## Reapplication

An application for admission is effective only for the quarter for which it is submitted. If you are ineligible for admission, or if you are admitted and do not register, you must file a new application if you wish to be considered for a later quarter. If you have been admitted to the university and paid registration fees, but did not attend, contact the Office of the Registrar for

readmission information. Review of the new application will be based on requirements in effect at time of readmission or reapplication.

## FEES AND EXPENSES

The exact cost of attending the University of California, San Diego will vary according to personal tastes and financial resources of the individual. Generally, the total expense for three quarters, or a college year, is estimated at \$8,400 for California residents living away from home.

It is possible to live simply and to participate moderately in the life of the student community on a limited budget. The best that the university can do to assist the student in planning a budget is to indicate certain and probable expenses. For information regarding student employment, loans, scholarships, and other forms of financial aid at UCSD, see "Campus Services and Facilities" in this catalog.

## COLLEGE BOARD ADVANCED PLACEMENT TESTS AT THE UNIVERSITY OF CALIFORNIA

|                 | AMERICAN HISTORY   | EUROPEAN HISTORY   | MATHEMATICS  | PHYSICS   | BIOLOGY  | CHEMISTRY  |
|-----------------|--|--|--|---|--|--|
| MUIR COLLEGE    | 8 units of elective credit. 3, 4, 5 = History 2A, 2B                                   | 8 units of elective credit. 3, 4, 5 = History 3A, 3B                                   | AB exams 4 units = exempt Math. 2A<br>BC exams 8 units = exempt Math. 2A, 2B if student also places high on math. placement exam | B exam = 8 units elective & exempt Physics 10<br>C exam; Mechanics, Score 3.4 = 4 units credit & exempt Physics 1A & may take Physics 2A for credit<br>Score 5 = 4 units credit & exempt Physics 2A & may take Physics 3A for credit<br>C exam: E&M, Score 3.4 = 4 units credit & exempt Physics 1B & may take Physics 2B for credit<br>Score 5 = 4 units credit & exempt Physics 2B & may take Physics 3B for credit | Score 3 = 8 units credit & exempt Biology 10<br>Score 4 or 5 = 8 units credit & exempt Biology 1, 2, & 3 (Note: only 8 units credit applied to lower-division major courses) | Score 3 = 8 units credit & exempt Chem. 4 or 10<br>Score 4 = 8 units credit & exempt Chem. 5A, 5B or Chem. 6A and may take Chem. 7A for credit<br>Score 5 = 8 units credit & exempt Chem. 6A, 6B, 6C or Chem. 7A, 7B |
| THIRD COLLEGE   | 2 courses toward humanities requirement  | 2 courses toward humanities requirement  | Same<br>Completes math portion of operative logic requirement.   | Same  | Same   | Same   |
| REVELLE COLLEGE | 2 courses toward social science requirement  | Can be used as 2 courses of the noncontiguous minor or 8 units of elective credit      | Same   | Same  | Same   | Same   |
| WARREN COLLEGE  | May apply toward program of concentration requirements. See Warren adviser for details | May apply toward program of concentration requirements. See Warren adviser for details | Same<br>BC completes formal skills requirement   | Same  | Same   | Same   |

NOTE: Please see college academic adviser for clarification of any questions you may have.

**ESTIMATED EXPENSES FOR ON-CAMPUS UNDERGRADUATE RESIDENTS OF CALIFORNIA**

Non-California residents should estimate approximately \$1,430.00 additional tuition fees each quarter.

|   | FALL<br>QUARTER | WINTER<br>QUARTER | SPRING<br>QUARTER | TOTAL          |
|---|-----------------|-------------------|-------------------|----------------|
| University Registration Fee *               | \$187           | \$187             | \$187             | \$561          |
| Educational Fee                             | 268             | 268               | 268               | 804            |
| Campus Activity Fee                         | 13.50           | 13.50             | 13.50             | 40.50          |
| University Center Fee                       | 37.50           | 37.50             | 37.50             | 112.50         |
| Recreation Facility Fee                     | 12              | 12                | 12                | 36             |
| Board and Room in<br>Residence Halls (Avg.) | 1,638           | 1,638             | 1,638             | 4,914          |
| Transportation (Approx.)                    | 162             | 162               | 162               | 486            |
| Books, Supplies (Approx.)                   | 128             | 128               | 128               | 384            |
| Personal Expenses (Approx.)                 | 371             | 371               | 371               | 1,113          |
| <b>Total</b>                                | <b>\$2,817</b>  | <b>\$2,817</b>    | <b>\$2,817</b>    | <b>\$8,451</b> |

NOTE: Fees are subject to change by the board of regents.

\*Estimated

| COMPUTER SCIENCE               | ENGLISH<br>(Meets Subject A<br>Requirement)   | FOREIGN LANGUAGE  | CLASSICS  | ART HISTORY   | STUDIO ART   | MUSIC   |
|--------------------------------|---|---|---|---|--|---|
| 5 units of<br>elective credit. | 8 units of elective<br>credit if score is<br>3, 4, or 5.  | 8 elective units;<br>determines placement<br>in language sequence<br>if student chooses<br>that option. 3, 4, 5<br>clears 31/51, 32/52. | 8 units of elective<br>credit. 3, 4, 5 =<br>Classical<br>Studies 19A,<br>19B.                     | 8 units of elective<br>credit. 3, 4, 5 =<br>2 quarters<br>of art history<br>sequence.   | 8 units of elective<br>credit, if score is<br>3, 4, or 5.                      | 8 units of elective<br>credit. 3, 4, 5 =<br>2 quarters<br>of music sequence                     |
| Same                           | 8 units of elective<br>credit.  | 2 courses toward<br>humanities sequence.  | 2 courses toward<br>humanities sequence.  | 2 courses toward<br>humanities sequence.  | 8 units of elective<br>credit.   | 2 courses toward<br>humanities sequence   |
| Same                           | Can be used as<br>2 courses of the<br>noncontiguous minor<br>or 10 units of<br>elective credit. | 8 units of elective<br>credit, usually<br>prepares students to<br>pass proficiency<br>exam.   | Can be used as<br>2 courses of the<br>noncontiguous minor<br>or as 8 units of<br>elective credit. | Fulfills Fine Arts<br>requirement or<br>can be used as 2<br>courses of the<br>noncontiguous<br>minor or as 8<br>units of elective<br>credit | Fulfills Fine Arts<br>requirement and<br>1 course of non-<br>contiguous minor. | Fulfills Fine Arts<br>requirement and<br>1 course of non-<br>contiguous minor.                  |
| Same                           | 8 units of elective<br>credit.  | 8 units of elective<br>credit.  | May apply toward<br>program of concentration<br>requirements. See Warren<br>adviser for details.  | May apply toward<br>program of concentration<br>requirements. See Warren<br>adviser for details.  | 8 units of elective<br>credit.   | May apply toward<br>program of concentration<br>requirements. See Warren<br>adviser for details |



# UNDERGRADUATE REGISTRATION

## REGISTRATION

### Enrollment in Courses

Prior to the quarter for which they have been admitted, new students will receive information from their college regarding orientation dates, enrollment in courses, and fee-payment deadlines. Enrollment materials will be provided at the college provosts' offices on the days assigned for new students' registration. New freshman students admitted for the fall quarter will be invited to attend a new student orientation during the summer preceding fall quarter. Enrollment in courses will take place at that time.

### New Student Orientation

Orientation programs are designed to acquaint students with the nature, functions and purposes of UCSD's college system, and to show students how to deal with a variety of requirements set by the university, college, and academic departments. Although all four colleges have the same goals for students, each has developed its own distinctive program. The professional staffs of Revelle, Muir, Third, and Warren have designed their programs for their respective students and the students' parents. During the school year, these same staff members are occupied in counseling continuing students, so they have planned these orientation sessions for the summer when they can devote 100 percent of their time to becoming acquainted with new students and introducing them to a whole new way of doing things.

Not only will new students be made aware of the opportunities offered by their college and the UCSD community as a whole, they will also receive a great deal of guidance in selecting courses, and will register in advance for their first fall quarter classes.

To prepare for the orientation session, students should spend a little time thinking about what they want from their edu-

cation. If the decision of which major to pursue has not been made, students can benefit by narrowing their choices, eliminating subjects they know they don't want, and selecting areas of possible interest. Students will have a lot of help in making such choices, but anything they can do in advance will make the process easier.

All new students are required to attend an orientation/registration session. Parents' attendance is, of course, optional, but we hope they will want to come. Parents' concerns about life at UCSD are not exactly the same as students', so they will be invited to separate meetings.

In addition to the Summer Orientation, students should attend **Welcome Week** — the week before the official opening of the fall quarter and the beginning of classes.

### Continuing Student Enrollment

Continuing students (those currently registered or eligible to register) should refer to the quarterly *Schedule of Classes* for preferred enrollment information, dates, and fee-payment instructions. The *Schedule of Classes* is published prior to each quarter and may be purchased at the University Bookstore.

### Definitions

Students are considered enrolled when their **Preferred Enrollment Request** forms are received and processed by the Office of the Registrar and space in classes has been reserved. Every effort will be made to enroll students in their preferred class sections. Students are not considered registered until they have both enrolled in courses and paid registration fees.

Currently, Preferred Enrollment Request forms are processed by the registrar's staff, with priority given according to class level. Undergraduate student levels are determined by completion of course units:

|            |                 |
|------------|-----------------|
| Freshmen   | 0- 44.9 units   |
| Sophomores | 45- 89.9 units  |
| Juniors    | 90- 134.9 units |
| Seniors    | 135- 184 units  |

Students will receive a *Class Confirmation* based upon the space available at the time of preferred enrollment. This *Class Confirmation* is attached to the *Registration form*. Students will be held responsible for all courses appearing on the *Class Confirmation* and must make any necessary changes by the add/drop process or by appropriate withdrawal.

The top portion of the Registration form is a *Fee Statement*. *Fees are due and payable upon receipt of the Registration form*. (See "Payment of Registration Fees.")

### Dropping and Adding Courses

After the preferred enrollment period, students may make any necessary corrections to their class schedules by submitting a *Drop/Add Card*. Students may add and drop courses with no penalty through the second week of instruction. Please refer to the quarterly *Schedule of Classes* for appropriate approvals required.

After the second week, students may not add courses. However, they may continue to drop courses to the end of the ninth week of instruction with a \$3 fee. Students who wish to drop *all* their courses are required to file an *Undergraduate Withdrawal/Leave* form with their college academic advising or dean's office. Please see the W (Withdrawal) grade regulation that applies after the fourth week of instruction.

### Weeks

|                |  |
|----------------|--|
| 1 - 2          | ADD/DROP — No fee<br>Change Grade Option                     |
| 2 - 4          | DROP ONLY — \$3.00 fee                                       |
| 5 - 9          | DROP ONLY — \$3.00 fee<br>With "W" recorded on<br>transcript |
| — 10 and later | — No changes — Final<br>grade assigned                       |

## THE UNDERGRADUATE PROGRAM

The undergraduate program consists of four courses each quarter or sixteen units per quarter for four years. Students must complete a minimum of thirty-six units in three consecutive quarters in order to satisfy the minimum progress requirements (see "Minimum Progress" in the "Academic Regulations" section). Undergraduate students wishing to take more than twenty and one-half units of credit in a quarter will need their college provost's approval.

### Approval for Enrollment for More than 192 Units

The minimum unit requirement for the bachelor's degree is 184 quarter-units in Revelle College and 180 quarter-units in Muir, Third, and Warren Colleges. A student is expected to complete the requirements for graduation within this minimum unit requirement.

Under special circumstances, students may extend their undergraduate training beyond the minimum. However, students who are attempting to achieve more than 192 quarter-units will not be permitted to register without their college provost's approval.

### Concurrent Enrollment

Concurrent enrollment in regular sessions at another institution or in UCSD Extension while enrolled on the San Diego campus is permitted only when approved in advance by the provost of the student's college.

### Registration Holds

A student may have a "hold" placed on his or her registration and/or academic record for the following reasons:

1. Failure to respond to official notices.
2. Failure to settle financial obligations when due or to make satisfactory arrangements with the Business Office.
3. Failure to present certification of degrees and/or status on leaving previous institution(s).
4. Failure to comply with admission conditions.

Each student who becomes subject to a registration hold action is given advance notice and ample time to deal with the situation. However, if the student fails to respond, action will be taken without further notice, and he or she is entitled to no further services of the university, except assistance toward reinstatement.

Undergraduate students wishing to have their status restored must secure a release from the office initiating the hold action. Reinstatement is not final until the registration process is completed.

### Change of Address

Students who change their local or permanent addresses after enrollment are expected to notify the registrar in writing at once. Change of address cards are available at the Office of the Registrar, 301 MAAC (Matthews Administrative and Academic Complex). Students will be held responsible for communications from any university office sent to the last address given, and should not claim indulgence on the plea of not receiving the communication.

## CALIFORNIA RESIDENCE REQUIREMENTS

### General

In order to be classified as a resident for tuition purposes upon admission, an adult student, other than an adult alien present in the U.S. under the terms of a nonimmigrant status which precludes the adult alien from remaining permanently in the U.S., must have established his or her residence in California for more than one year immediately preceding the residence determination date for the term during which he or she proposes to attend the university and relinquished any prior residence. An adult student must couple his or her physical presence within this state for one year with objective evidence that such presence is consistent with his or her intent in making California his or her permanent home and, if these steps are delayed, the one-year durational period will be extended until BOTH presence and intent have been demonstrated for one full year. Physical presence within the state solely for educational purposes does *not* constitute the establishment of California residence under state law regardless of the length of his or her stay in California.

Relevant indicia which can be relied upon to demonstrate one's intent to make California his or her permanent residence include, but are not limited to, the following: registering and voting in California elections; designating California as his or her permanent address on all school and employment records, including military records if one is in the military service; obtaining a California driver's license, or California Identification Card if a non-driver; obtaining California vehicle registration; paying California income taxes as a resident, including income earned outside this state from the date residence is established; establishing an abode where one's permanent belongings are kept within California; licensing for professional practice in California, and the absence of these indicia in other states during any period for which residence in California is asserted. Documentary evidence may be required. No single factor is controlling or decisive. All relevant indicia will be considered in the classification determination.

The residence of the parent with whom an unmarried minor (under age eighteen) maintains his or her place of abode is the residence of the unmarried minor. When minors live with neither parent their residency is that of the parent with whom they maintained their last place of abode. Minors, except minor aliens present in the U.S. under the terms of a nonimmigrant status which precludes the minor alien from remaining in the U.S. permanently, may establish their residence when both parents are deceased and a legal guardian has not been appointed. The residence of unmarried minors who have a parent living cannot be changed by their own act, by the appointment of a legal guardian, or by relinquishment of a parent's right of control. Where the residence of the minor is derived, the California residence of the parent from whom it is derived must satisfy the one year durational requirement.

A man or a woman establishes his or her residence. A woman's residence shall not be derivative from that of her husband, or vice versa.

## Exceptions

1. Students who are U.S. citizens or eligible aliens who remain in this state after their parent, who was a California resident for at least one year prior to leaving and has during the student's minority and within one year immediately prior to the residence determination date, established residence elsewhere, shall be entitled to resident classification until they have attained the age of majority and have resided in the state the minimum time necessary to become a resident so long as, once enrolled, they maintain continuous attendance at an institution.
2. Students who are U.S. citizens or eligible aliens who are minors or eighteen years of age and can evidence that they have been totally self-supporting through employment and actually present within California for the entire year immediately prior to the residence determination date and have evidenced the intent to make California their permanent home may be eligible for resident status.
3. Students who are U.S. citizens or eligible aliens shall be entitled to resident classification if immediately prior to the residence determination date they have lived with and been under the continuous direct care and control of any adult or adults other than a parent for not less than two years, provided that the adult or adults having such control have been California residents during the year immediately prior to the residence determination date. This exception continues until the student has attained the age of eighteen and has resided in the state the minimum time necessary to become a resident student, so long as continuous attendance is maintained at an institution.
4. Exemption from payment of the non-resident tuition fee is available to the natural or adopted child, stepchild, or spouse who is a dependent of a member of the United States military stationed in California on active duty. Such resident classification may be maintained until the student has resided in California the minimum time necessary to become a resident. If a student is enrolled in an institution and the (1) member of the military is trans-



ferred on military orders to a place outside this state where he continues to serve in the armed forces or (2) the member of the military retires from active duty immediately after having been on active duty in California, the student is entitled to retain resident classification under conditions set forth above.

5. Students who are members of the United States military stationed in California on active duty, except a member of the military assigned for educational purposes to a state-supported institution of higher education, shall be entitled to resident classification until they have resided in the state the minimum time necessary to become residents.
6. Children of deceased public law enforcement or fire suppression employees, who were California residents, and who were killed in the course of law enforcement or fire suppression duties, may be entitled to resident classification.
7. A student who is the dependent child or spouse of a full-time employee of the University of California who is assigned to work outside of the State of California may be entitled to resident classification. Inquiries regarding the employee waivers should be directed to the Office of the Registrar.

## Reclassification

The student must petition to have his or her status changed at the Office of the Registrar, and documentation of residence (driver's license, voter registration card, etc.) may be requested at that time. All changes of status must be initiated in person prior to the late registration period for the quarter or semester for which the student intends to be reclassified.

Financial independence will be included among the factors considered for students seeking reclassification. Financial independence will not be considered for graduate students who are teaching assistants, research assistants, or teaching associates employed on a 0.49% or more time basis for the term for which reclassification is sought.



### Procedures

New and returning students are required to complete a Statement of Legal Residence. Inquiries from prospective students regarding residence requirements for tuition purposes should be directed to the residence deputy, located in the Office of Admissions and Registrar, Building 102, Administrative Complex or to the legal analyst-residence matters. No other university personnel are authorized to supply information relative to residence requirements for tuition purposes. Any student, following a final decision on residence classification by the residence deputy, may make written appeal to the Legal Analyst-Residence Matters, 590 University Hall, Berkeley, California 94720, within ninety days after notification of the final decision by the residence deputy.

All students classified incorrectly as residents are subject to reclassification and to payment of all nonresident fees not paid. If incorrect classification results from falsification or concealment of facts by the student, the student is subject also to university discipline. Resident students who become nonresidents must immediately notify the residence deputy.

Students are cautioned that this summation is not a complete explanation of the law regarding residence. They should also note that changes may have been

made in the rate of nonresident tuition and the residence requirements between the time this catalog statement is published and the relevant residence determination date. Regulations have been adopted by the regents, a copy of which is available for inspection in the Office of Admissions and Records.

### Waivers of Nonresident Tuition

To the extent funds are available, nonresident tuition waivers may be granted to spouses and unmarried, dependent children under age twenty-one of university faculty who are members of the Academic Senate. Inquiries regarding faculty waivers should be directed to the Office of the Registrar.

### PAYMENT OF REGISTRATION FEES

The university registration fee, educational fee, campus activity fee, recreational facility fee, university center fee, and the nonresident tuition fee (if applicable) must be paid for the student to be considered registered. A student who has not registered (enrolled for classes and paid fees) prior to the end of the second week of instruction will be removed from the registrar's file and must initiate reinstatement procedures. Special permission to

enroll after the end of the second week of instruction is required, and large penalty fines are assessed.

NOTE: See "Estimated Expenses for Undergraduate Residents of California."

### Payment of Fees

All general university fees and deposits (university registration fee, educational fee, campus activity fee, university center fee, recreational facility fee, and tuition for nonresidents of California) must be paid to the Cashier's Office. Fees are due and payable upon receipt of the REGISTRATION FORM which itemizes mandatory registration fees.

All prior delinquent debts must also be paid. An optional student health insurance plan is assessed with registration fees and can be purchased at the time registration fees are due. (Health insurance is mandatory for foreign students.) An additional charge will be made for failure to pay required fees or deposits by the dates announced in this catalog and in the quarterly *Schedule of Classes*. Please note that students who enroll in courses but fail to pay fees prior to the end of the fourth day of instruction will be assessed a late payment penalty fine. Students who pay fees but fail to enroll in courses prior to the end of the second week of instruction will be assessed a late enrollment penalty fine and must receive permission to enroll. Students who fail to enroll *and* pay fees on time will be assessed both fines. Currently these fines are \$50 each. (See "Miscellaneous Expenses" below.)

With the exception of appeals to the legal analyst-residence matters regarding a student's residence classification, no claim for remission of fees will be considered unless such claim is presented during the fiscal year to which the claim is applicable. Students who wish to appeal a final decision on residence classification by their campus must do so in writing within ninety calendar days of notification of the campus's final decision. Such appeals should be addressed to the Legal Analyst-Residence Matters at 590 University Hall, 2200 University Avenue, Berkeley, California 94720.

Receipts of proof of payment are issued for all payments, and these should be carefully preserved. No student will be entitled to a refund except after surrender to the Cashier's Office of the student's original receipt, if issued, or cancelled check or money order receipt.





## Exemption from Fees

Except for miscellaneous fees and service charges, no fees of any kind are assessed any surviving child of a California resident who was an active law enforcement or active fire suppression official and who was killed in the performance of active duties or died as a result of an accident or injury caused by external violence or physical force incurred in the performance of such duties.

Students who believe themselves entitled to one of these exemptions must apply for a fee exemption at the Office of the Registrar before registering. Without this authorization students will not be permitted to register without payment of the entire fee. Graduate students should apply to the dean of Graduate Studies.

## Nonresident Tuition

Students who have not established and maintained California residence for at least one year immediately prior to the residence determination date for the term during which they propose to attend the university, and who do not otherwise qualify for resident classification under California law, are charged, along with other fees, a nonresident tuition fee each quarter. The residence determination date is the day instruction begins at the last of the University of California campuses to open for the quarter. Final classifications are made by the residence deputy who is located in the registrar's office, on the basis of a Statement of Legal Residence completed by the student and signed under oath. Prospective students who have questions regarding their residence status should consult the *General Catalog* or contact the residence deputy.

## University Registration Fee

The university registration fee is approximately \$560 per year for undergraduates (which must be paid at the time of registration) and covers certain expenses for use of library books, for recreational facilities and equipment, for registration and graduation, for all laboratory and course fees, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service or by health and accident insurance purchased by the university. No part of this fee is refunded to students who do not make use of these privileges. Exemption from this fee may



be granted for surviving children of certain deceased California fire fighters or law enforcement officers. Students should check with the Student Financial Services Office for full ruling.

In addition, there is a campus activity fee of \$40.50 per year for undergraduates, a university center fee of \$112.50 per year for all students to be used for the construction and operation of the student centers, and a \$36 per year recreational facility fee.

## Miscellaneous Expenses, Fees, Fines, and Penalties

Books and stationery average about \$200 per quarter. However, students should be aware of the following possible expenses:

|  |      |
|--|------|
| Statement of Intent to Register fee (new undergraduate)            | \$50 |
| (Fall, 1988 — \$100)   |      |
| Application fee (one campus)                                       | 35   |
| Each additional campus   | 20   |
| Changes in course selection after announced dates (Drop/Add Cards) | 3    |
| Duplicate Photo I.D. Card  | 10   |
| Request to Receive/Remove Grade "I"                                | 5    |
| Transcript of record   | 3    |
| Late filing of announcement of candidacy for B.A.                  | 3    |
| Late enrollment  | 50   |
| Return check collection  | 10   |
| Late payment of fees (late registration)                           | 50   |
| (See also "Withdrawal from the University.")                       |      |

## Educational Fee

The educational fee was established for all students beginning with the fall quarter, 1970. The undergraduate educational fee is \$804 per year.

## Parking

Students who park motor vehicles on the campus are subject to parking fees. Parking permits are sold at the Cashier's Office. A copy of the campus parking regulations may be obtained from the cashier at the time of permit purchase.

## PART-TIME STUDY AT THE UNIVERSITY OF CALIFORNIA

### General Policy

1. Degree programs in the university may be open to part-time students whenever good educational reasons exist for so doing.
2. No majors or other degree programs will be offered only for part-time students, except as specifically authorized by the Academic Senate.

3. For the purposes of this statement of policy and procedures, the following definition applies:

A part-time undergraduate student is one who is approved to enroll for ten units or fewer, or an equivalent number of courses, per quarter.

### Admissions and Enrollment

1. The same admissions standards that apply to full-time students will apply to part-time students.
2. Approval for individual students to enroll on a part-time basis will be given for reasons of occupation, family responsibilities, or health.
3. Approval to enroll as a part-time student shall be given by the appropriate dean or provost.
4. Students must apply for part-time study prior to the end of the second week of the quarter *and* must be enrolled in ten or fewer units at that time *including* any units taken through UCSD Extension.

### Procedures

Students must apply for part-time status on the Part-Time Study application form available in the Office of the Registrar or colleges *prior to the end of the second week of the quarter*. Approval for part-time study is granted for one academic year only — fall through spring quarters, winter through spring quarters, or spring quarter only. Students must reapply for approval each fall quarter and substantiate reasons for request. Approval for part-time study will automatically exempt students from the thirty-six unit-per-year minimum progress requirement. Students who are receiving financial assistance should contact their college financial aid office regarding eligibility requirements.



### Reduced Fees

Undergraduate students who have been approved for part-time study and who are enrolled in ten units or fewer at the end of the second week of classes are eligible for a reduction of one-half of the educational fee and one-half of nonresident tuition, if applicable. Students who drop to ten or fewer units after this date will receive no reduction, and any student who receives a reduction in fees will be billed for the difference if the number of units increases to ten and one-half or more anytime in the quarter.

Undergraduates enrolled in Education Abroad and other special programs are excluded from this reduced fee policy. Extension courses taken by students in the Complimentary Enrollment Program *will* be included in the unit count whether or not the credit is accepted as part of a university degree program. Refund checks will be mailed by the Accounting Office to all eligible students by the end of the eighth week of classes. Questions concerning this policy may be addressed to the Office of the Registrar.

# ACADEMIC REGULATIONS

## UNDERGRADUATE DEGREE REQUIREMENTS

Each of the undergraduate colleges on the San Diego campus has specific requirements for a degree. (See "Choosing a College at UCSD.") Students enrolled at UCSD from their freshman year may elect to meet as graduation requirements (UC, UCSD, college, premajor, and major requirements) either those listed in the catalog at the time of entrance or those established after entrance. Students transferring from other institutions of higher education may elect to meet as graduation requirements either those in effect at the time of transfer to UCSD, those subsequently established, or those in effect at the time of entering their other institution of higher learning, provided that the date of entrance at the previous institution is not more than three years prior to the time of transfer to UCSD. However, for departments or programs with a separate entrance procedure, the student may elect as the upper-division requirements only those in effect at the time of admission to the major or those established after admission to the major. A student who seeks readmission to UCSD more than three consecutive quarters after withdrawing from student status must either adhere to the graduation requirements at the time of readmission or those subsequently established.

Requirements for graduation shall be determined by the colleges in conformity with university-wide regulations and subject to approval by the San Diego Division of the Academic Senate. In addition, the following are required of all undergraduates:

## American History and Institutions

A knowledge of American history and of the principles of American institutions under the federal and state constitutions is required of all candidates for the bachelor's degree. This requirement may be met in any one of the following ways:

1. One high school unit in American history, or one-half high school unit in American history and one-half high school unit in civics or American government.
2. By passing any one-quarter course of instruction accepted as satisfactory by the Committee on Educational Policy and Courses. Any of the following courses are suitable for fulfilling the requirement: History 2A-B-C, 7A-B-C, 154A-B, 160, 161, 167A-B, 169A-B, and Political Science 10, 100A, 100B, 102C, 104A.
3. By presenting proof of having received a score of 500 or more on the CEEB Achievement Test in American History.
4. By presenting proof of having received a grade of 3 or higher on the Advanced Placement Test in American History administered by the Educational Testing Service, Princeton, New Jersey.
5. By presenting proof of having satisfied the present requirement as administered at another collegiate institution within the state.
6. By presenting proof of successful completion of a one-quarter or one-semester course in either American history or American government at a recognized institution of higher education, junior colleges included, within the United States.
7. An alien attending the university on a F-1 or J-1 student visa may, by showing proof of temporary residence in the United States, petition for exemption from this requirement through the office of his or her college provost.

## Subject A: English Composition

The University of California requires all undergraduate students (including international students) to demonstrate a minimum proficiency in English composition (the Subject A requirement). This proficiency can be demonstrated by:

1. Submitting a score of 600 or better on the English Composition Test, an achievement test of the College Entrance Examination Board (CEEB) (Note: not to be confused with the verbal portion of the Scholastic Aptitude Test [SAT]); or
2. Submitting a score of 3, 4, or 5 on the CEEB Advanced Placement Test in English; or
3. Submitting proof of completion, prior to enrollment at UCSD, of a transfer-level college course of four quarter-units or three semester-units in English composition with a grade of C or better; or
4. Submitting proof of scoring a "Pass for Credit" on the California State University English Equivalency Examination (Note: the CSU English Placement test may *not* be used to satisfy the Subject A requirement); or
5. Writing a passing essay on the Subject A Proficiency Test (which is *required* of all students who have not otherwise met the requirement). *This examination may be taken only once.*

Students who have not satisfied the Subject A requirement before enrolling at UCSD must satisfy the requirement by achieving a grade of C or better in SDCC 1 (English Composition — Subject A) and by passing the Subject A Exit Examination given at the end of SDCC 1. That examination is administered by the Subject A Program office. Students should enroll in SDCC 1 during their first quarter of residence at UCSD, or as soon thereafter.

ter as space is available in the course. For further information on SDCC 1, refer to "Subject A" in the catalog section "Courses, Curricula, and Programs of Instruction."

The Subject A requirement must be satisfied during a student's first year of residence. Those who have not satisfied the requirement after three quarters of enrollment will not be eligible for a fourth quarter. Extensions of this requirement are available to students requiring special English as a Second Language instruction.

Students will not be allowed to enroll in university-level writing courses at UCSD until the Subject A requirement has been satisfied.

For further information about the Subject A requirement or the Proficiency Test, please visit the Subject A Program office, Humanities/Undergraduate Library Bldg. 1523, or call (619) 534-6177.

### **Senior Residence**

Each candidate for the bachelor's degree must complete thirty-six of the final forty-five units in residence in the college or school of the University of California in which the degree is to be earned.

Under certain circumstances, such as when a student attends classes on another UC campus as an approved visitor or participates in the UC Education Abroad Program or the San Diego Opportunities Abroad Program, exceptions may be granted by the provost.

Note: Courses taken through the UCSD Extension Concurrent Enrollment Program will not apply toward a UCSD student's senior residency requirement. For further details see "Graduation Requirements" in the Index.

### **Graduation Credit for Physical Education Courses**

No more than three units of physical education, whether earned at UCSD or transferred from another institution, may be counted toward graduation.

### **Undergraduate Minors and Programs of Concentration**

A minor curriculum — or "minor" for short — is a set of six courses on a well-defined subject, at least three of which must be upper-division courses. In the case of a subject that is the responsibility of a particular department, such as litera-

ture, physics or sociology, that department specifies which courses are acceptable for a minor curriculum in its section of this *General Catalog*. All other minor curricula must be approved by the Committee on Educational Policy and be published in this *General Catalog*. A student may not apply toward the minor any course that has been used to satisfy the requirements of his or her major curriculum. A student's successful completion of a minor curriculum will be recorded on his or her transcript at graduation.

Certain colleges require their students to complete one or more "programs of concentration" before graduation, and which courses or types of courses are acceptable for programs of concentration are determined by the faculty of the college or a subcommittee thereof. A program of concentration is not necessarily a minor. Indeed, a program of concentration is a minor only if it meets the criteria in the above paragraph, and only then may it be listed on a student's transcript as a minor. Otherwise it will be recorded as a concentration at graduation.

### **Honors**

#### **College Honors at Graduation**

The Academic Senate has established the following standards for award of college honors at graduation:

There shall be a campus-wide requirement for the award of college honors at graduation. No more than 14 percent of the graduating seniors on campus shall be eligible for college honors. Normally, no more than the top 2 percent shall be eligible for *summa cum laude* and no more than the next 4 percent for *magna cum laude*, although minor variations from year to year shall be permitted. The remaining 8 percent are eligible for *cum laude*. The ranking of students for eligibility for college honors shall be based upon the grade-point average. In addition, to be eligible for honors, a student must receive letter grades for at least eighty quarter-units of course work at the University of California. Each college may award honors at graduation only to those who are eligible to receive college honors.

#### **Department Honors**

Each department or program may award honors to a student at graduation if the following two criteria are met:

1. The student has completed a *special* course of study within the department

or program. The requirements for this special course of study shall be approved by CEP and published in the *General Catalog*.

2. No more than 20 percent of the seniors graduating from a department or program may be awarded departmental honors.

Honors awarded by departments may be designated on the diploma by the words "with distinction," "with high distinction," and "with highest distinction" after the departmental or program name. Currently eleven departments, the Chinese Studies Program, and the Muir Special Project major are approved to award honors to no more than 20 percent of graduating seniors: the Departments of Anthropology, Biology, Economics and Economics (Management Science), History, Linguistics, Literature, Music, Philosophy, Political Science, Psychology, and Sociology.

#### **Provost Honors**

Provost honors are awarded quarterly based upon the completion of twelve graded units with a GPA of 3.5 or higher with no grade of D, F, or NP recorded for the quarter.

#### **Phi Beta Kappa**

Phi Beta Kappa is a national honor society in the liberal arts and sciences. The society was founded at the College of William and Mary in 1776. Membership is awarded for high scholastic standing and appropriate academic background. A committee of the local Phi Beta Kappa Chapter (Sigma, 1977) reviews candidates once each year.

Among the minimum requirements for election to this society are:

- Acceptable major in liberal arts or sciences
- Rank in the top 10 percent of the class
- A college-level quantitative science such as mathematics
- Competency in college math indicated by at least one year of college-level calculus
- Proficiency in a foreign language
- A strong grounding in the humanities (you must have a minimum of six humanities courses)
- Residency at UCSD for at least two years.



## Application for Degree

Undergraduate seniors are required to file an Application for a Degree form with their college academic advising office. Filing deadlines vary from college to college and may be as early as the ninth week of the quarter preceding the quarter of graduation. Students should check with their college academic advising office for exact deadlines. Advising and counseling sessions should take place well before the quarter of graduation to ensure all degree requirements will be satisfied. Applications not on file by the deadline are subject to special approval and a \$3.00 late filing fee. Students who do not meet degree requirements must file a new application. Failure to file this petition may delay the graduation date and receipt of diploma.

## SPECIFIC REGULATIONS

### Progress toward Degrees

In order to apply the units of a course toward unit requirements for a degree, a student must receive an A, B, C, D, P, or S grade in the course. (Plus or minus suffixes (+/-) may be affixed to A, B, and C.) Further, an undergraduate student must have a 2.0 or higher grade-point average (GPA) to receive a bachelor's degree, and a graduate student must have a 3.0 or higher GPA to receive a higher degree.

### Probation

An undergraduate student is subject to academic probation if at the end of any

term his or her GPA for that term or his or her cumulative GPA is less than 2.0.

### Subject to Disqualification

An undergraduate student is subject to academic disqualification from further registration if at the end of any term his or her GPA for that term is less than 1.5 or if he or she has completed two successive terms on academic probation without achieving a cumulative GPA of 2.0. Continued registration of an undergraduate who is subject to disqualification is at the discretion of the faculty of the student's college, or its authorized agent (generally the provost/Office of the Provost).

If a student is not currently in scholastic good standing or has been denied registration for the next ensuing quarter on the date on which he or she left the university, a statement of his or her status shall accompany his or her transcript. A student who has been disqualified from further registration at the University of California may not register for UCSD courses through Summer Session, through UCSD Extension by way of the concurrent enrollment mechanism, or in UCSD Extension courses offered at the 100 level. Students receiving financial assistance should refer to information in the Student Financial Services section of this catalog. Unique scholarship eligibility requirements must be met.

NOTE: Veteran students receiving financial assistance from the Veterans Administration should refer to unique requirements set by state approving agencies. See veterans' information under Student Financial Services.

## Minimum Progress

A full-time undergraduate student is subject to disqualification from further registration if he or she does not complete thirty-six units in any three consecutive quarters of enrollment. Continued registration of an undergraduate who is subject to disqualification due to lack of minimum progress is at the discretion of the faculty of the student's college, or its authorized agent (generally the provost/Office of the Provost).

Eligible students may file for an exemption from the minimum progress requirement by completing the Part-time Study application and receiving college approval *prior* to the end of the second week of the quarter. (See "Part-time Study at the University of California.")

## Double Majors

Students in good academic standing may be permitted to register for double majors. Students must secure approval by petition and by fulfillment of the requirements (prerequisites and upper-division courses) of both programs. If, however, the majors lead to different degrees (e.g., a bachelor of arts in music and a bachelor of science in electrical engineering), the student must choose which degree is to appear on the diploma. All majors will be recorded on the diploma; the transcript will show that requirements for these majors satisfy those for possibly different degrees.

The following conditions must exist:

1. Lower-division prerequisites may overlap.
2. At least eight upper-division courses must be unique to each major.
3. The majors must be completed within the limit of 208 units.
4. Approval is secured from appropriate departmental advisers.
5. Approval is secured from the college provost.

Normally, students will be sophomores when the request is made in order to ensure correct planning.

With very few exceptions, double majors within the same department are unacceptable, as are double majors consisting of a departmental major and an interdisciplinary major associated with the same department.



## Repetition of Courses

Repetition for credit of courses not so authorized by the appropriate Committee on Courses is allowed subject to the following limitations:

1. A student may *not* repeat a course for which a grade of A, B, C, I, P, or S is recorded on his or her transcript. (Plus or minus suffixes (+/-) may be affixed to A, B, and C.)
2. Courses in which a grade of D or F has been awarded may not be repeated on a P/NP or S/U basis.
3. Undergraduate students may repeat a course in which a grade of NP has been awarded for a P/NP or letter grade, if applicable. Graduate students may repeat a course in which a grade of U has been awarded on an S/U basis only.
4. Repetition of a course for which a student's transcript bears two or more entries with grades among D, F, NP, or U requires approval of the appropriate provost or dean.
5. All grades received by a student shall be recorded on the student's transcript.
6. The first sixteen units of courses that have been repeated by an undergraduate student and for which the student received a grade among D, F, NP, or U shall not be used in grade-point calculations.

NOTE: Although the University of California grade-point average will not include these repeated courses, other institutions/graduate programs, and agencies may recalculate the grade-point average to reflect all assigned grades.

## Special Studies Courses

Subject to the limitations below, a student may earn credit for supervised special studies courses on topics of his or her own selection. An undergraduate taking one or more special studies courses must complete an application for each such course before the start of the course.

### Course Number

Ordinarily, special studies courses are numbered 197, 198, or 199. The 197 course is for individually arranged field studies. The 198 course is for directed group study. The 199 course is for individual independent study.

## Limitations:

1. Enrollment requires the prior consent of the instructor who is to supervise the study, and the approval of the department chairperson. The applicant shall show that his or her background is adequate for the proposed study.
2. A student must have completed at least ninety units of undergraduate study and must be in good academic standing (2.5 grade-point average or better).
3. A student may enroll for no more than a total of four units of 198 and 199 Special Studies Courses in one term.
4. On the advice of the instructor(s) and the department chairperson(s) concerned, the provost of a student's college may authorize exceptions to the limitations listed.
5. Only a grade of P or NP is to be assigned for a 197, 198, or 199 course.
6. Subject to the approval of the CEP Subcommittee on Undergraduate Courses, a department may impose additional limitations on its supervised special studies courses.

## Procedures:

1. Students must complete an "Application for UCSD Special Studies Course Enrollment" available in department offices, and secure instructor and department chairperson approval.
2. Students must secure the department stamp on a Preferred Enrollment Request or Add/Drop Card to enroll or add a class.
3. A final grade will not be assigned to a student unless a copy of the approved application is on file in the Office of the Registrar.

## Undergraduate Assistance in Courses

An undergraduate instructional apprentice is an undergraduate student who serves as an assistant in an undergraduate course under the supervision of a faculty member. The purpose of the apprenticeship is to learn the methodology of teaching through actual practice in a regularly scheduled course.

### Guidelines:

1. An undergraduate instructional apprentice shall be an upper-division student. He or she shall be involved only with lower-division courses.

2. Students are not permitted to assist in courses in which they are enrolled.
3. An undergraduate instructional apprentice must have a minimum grade-point average of 3.0. Departments may establish higher grade-point average requirements.
4. The faculty instructor is responsible for course content and for maintaining the overall quality of instruction, including supervision of undergraduate instructional apprentices. The faculty instructor is responsible for all grades given in the class.
5. The instructor is expected to meet regularly with the undergraduate apprentice to evaluate the student's performance and to provide the direction needed for a worthwhile educational experience.
6. An undergraduate instructional apprentice may receive credit on a Pass/Not Pass basis only (through registration in a 195 course), subject to approval by the Committee on Educational Policy.
7. A student may not be an instructional apprentice more than once for the same course for credit.
8. A student may not be an instructional apprentice in more than one course in a quarter.
9. The total credit accumulated as an apprentice shall not exceed eight units.

## Procedure

All departments/programs using undergraduate instructional apprentices shall submit to the CEP Subcommittee on Undergraduate Courses a description of the role of the undergraduate instructional apprentice, as part of the petition for approval. Any deviation from the guidelines above must be explained and justified in a memo accompanying the petition. Any major change in the function or duty of the apprentice in a course should also be approved by the CEP Subcommittee on Undergraduate Courses.

## Writing Requirements

A student may register in an upper-division course only if the student has satisfactorily completed the writing requirement of his or her college or has obtained the consent of the instructor of the upper-division course. The require-

ment is waived for a student who has been admitted as a transfer student and has not completed three quarters of residence at UCSD.

## Final Examinations

Final examinations are obligatory in all undergraduate courses except laboratory courses, or their equivalent, as individually determined by the Committee on Courses.

Each such examination shall be conducted in writing, whenever practical, and must be completed by all participants within the announced time shown in the *Schedule of Classes* for the quarter in question. These examinations may not exceed three hours in duration.

In laboratory courses, the department concerned may, at its option, require a final examination subject to prior announcement in the *Schedule of Classes* for the term.

It is the policy of the university to make reasonable efforts to accommodate students having bona fide religious conflicts with scheduled examinations by providing alternative times or methods to take such examinations. If a student anticipates that a scheduled class meeting or examination will occur at a time at which his or her religious beliefs prohibit participation in the class or examination, the student must submit to the instructor, *no later than the end of the second week of instruction of the quarter*, a statement describing the nature of the religious conflict and specifying the days and times of conflict together with documentation of the religious proscription and of the student's adherence to this religious belief. Upon determination that a conflict with the student's religious beliefs does exist, the instructor will attempt to provide an alternative, equitable examination procedure which does not create an undue hardship for the instructor.

## Credit by Examination

With the instructor's approval and concurrence by the student's provost, a currently enrolled and registered undergraduate student in good standing may petition to obtain credit for some courses by examination. Credit by examination is intended for students who study the course material on their own and then petition for credit by examination when they feel they are prepared. The examination will cover work for the entire course.

Except as authorized by the instructor and appropriate provost, credit by examination may not be used to repeat a grade of D, F, or W. A part-time student who, by registering to take a course credit by examination, surpasses the number of units allowed for part-time status must pay fees as a full-time student. Credit by examination is not available to students during summer sessions. There will be a \$5 fee for each Credit by Examination petition.

## Use of Student Petition

For exceptional circumstances, students may request approval for variances to regulations and policies. This should be done by filling out an Undergraduate Student Petition (available in the provosts' offices or the Office of the Registrar), securing the necessary approvals, and filing the petition with the provost of the student's college.

## GRADING POLICY

Grades in undergraduate courses are defined as follows: A, excellent; B, good; C, fair; D, poor; F, fail; I, incomplete (work of passing quality but incomplete for good cause); and IP (In Progress courses approved for more than a one-quarter sequence). The designations P (Pass) and NP (Not Pass) are used in reporting grades for some undergraduate courses. P denotes a letter grade of C- or better. NR indicates no record or no report of grade was received from the instructor. W is recorded on the transcript indicating the student withdrew or dropped the course sometime between the beginning of the fifth week of a quarter to the end of the ninth week of a quarter (see "The W Grade").

Instructors have the option of assigning plus (+) and minus (-) suffixes to the grades A, B, and C. This option became available as of fall 1983.

## Grade Points

For each student the registrar will calculate a grade-point average (GPA) over courses taken at any campus of the University of California, not including Extension courses. Grade points per unit will be assigned as follows: A = 4, B = 3, C = 2, D = 1, F = 0. When attached to the grades of B and C, plus (+) grades carry three-tenths of a grade point more per unit. The grade of A+, when awarded, represents extraordinary achievement but does not

receive grade-point credit beyond that received for the grade of A. When attached to the grades of A, B and C, minus (-) grades carry three-tenths of a grade point less per unit than the unsuffixed grades. Courses in which an I, IP, P, NP, S, U, or W grade has been awarded will be disregarded in grade-point calculations. A graduate student's GPA will be calculated over courses taken while in graduate standing.

| Grade | Grade Points | Grade | Grade Points |
|-------|--------------|-------|--------------|
| A+    | 4.0          | C+    | 2.3          |
| A     | 4.0          | C     | 2.0          |
| A-    | 3.7          | C-    | 1.7          |
| B+    | 3.3          | D     | 1.0          |
| B     | 3.0          | F     | 0            |
| B-    | 2.7          |       |              |

The grade-point average is computed by dividing the total number of grade points earned by the total unit value of courses attempted.

At the end of each quarter, the instructor of each course will assign a letter grade to each student who was enrolled in that course at the end of the ninth week of instruction on the basis of the work required for the entire course. An I grade may be assigned, if appropriate.

For each student the registrar will calculate a grade-point average (GPA) over courses taken at any campus of the University of California, not including UCSD Extension courses. A graduate student's GPA will be calculated over courses taken while in graduate standing.

## Changes in Grades

All grades except I and IP are final when filed by instructors on end-of-term grade reports. However, a final grade may be corrected when a clerical or procedural error is discovered. *No change of a final grade may be made on the basis of revision or augmentation of a student's work in the course. No term grade except Incomplete may be revised by further examination. No grade may be changed after one calendar year from the time it was recorded.*



## No Report/No Record

An NR appearing on student transcripts in lieu of a grade indicates that the student's name appeared on a grade report but no grade was assigned by the instructor. An NR entry will lapse automatically into an F, NP or U if not removed or replaced by a final grade by the last day of instruction of the subsequent quarter, and will be computed in the student's GPA.

## Pass/Not Pass

The Pass/Not Pass option is designed to encourage undergraduate students to venture into courses which they might otherwise hesitate to take because they are uncertain about their aptitude or preparation. Consistent with college policy, an undergraduate student in good standing may elect to be graded on a P/NP basis in a course. No more than one-fourth of an undergraduate student's total course units taken at UCSD and counted in satisfaction of degree requirements may be graded on a P/NP basis. Departments may require that courses applied toward the major be taken on a letter-grade basis. Enrollment under this option must take place within the first two weeks of the course. A grade of Pass shall be awarded only for work which otherwise would receive a grade of C – or better. Units passed shall be counted in satisfaction of degree requirements, but such courses shall be disregarded in determining a student's grade-point average. (See "Physical Education Credit toward Graduation.")

After the Preferred-Program Request has been filed, the Drop/Add Card is used to change from letter grade to P/NP, or vice versa. The last day to add courses will be the final date to make this change.

Only a grade of P or NP is to be assigned for courses numbered 195, 197, 198, and 199. Subject to the approval of the CEP Subcommittee on Undergraduate Courses, departments may impose additional limitations or restrictions.

Only a grade of P or NP is to be assigned an undergraduate student's work in a noncredit (0-unit) course.

NOTE: See "Choosing a College at UCSD" section for further information regarding the P/NP grading option.

## The W Grade

When a student withdraws from the university or drops a course between the beginning of the fifth week of instruction and the end of the ninth week of instruction of a quarter, the registrar will assign a W to the student for each course affected. Only the registrar may assign a W.

Courses in which a W has been entered on the student's transcript will be disregarded in determining a student's grade-point average.

## Adding and Dropping Courses and the W Grade

A student may, with the approval of the instructor (and adviser, if required), add a course to the study list before the end of the second week of instruction of a quarter.

A student may drop a course before the end of the ninth week of instruction by filing the appropriate form with the registrar, after first notifying the instructor and/or department.

A student who wishes to drop all courses is required to file an Undergraduate Request for Withdrawal form with the college academic advising or dean's office.

1. A course dropped before the end of the fourth week of instruction will not be entered on the student's transcript.
2. If a student drops a course after the end of the fourth week of instruction and before the end of the ninth week of instruction, the registrar will assign a final grade of W to the student for that course.
3. A student may not drop a course after the end of the ninth week of instruction.

When an instructor has assigned a grade in a course in accordance with the Academic Senate policy on Integrity of Scholarship prior to the end of the ninth week of instruction, that grade may not subsequently be changed by dropping the course or withdrawing from the university.

## Withdrawing from School and the W Grade

A student may withdraw from the university before the end of the ninth week of instruction of a quarter.

1. If a student withdraws before the end of the fourth week of instruction, no

course entries will appear on the student's transcript for that quarter.

2. If a student withdraws after the end of the fourth week of instruction and before the end of the ninth week of instruction, the registrar will assign a final grade of W to the student for each course in which the student was enrolled at the beginning of the fifth week of instruction.
3. Each student will receive a final grade for each course in which the student was enrolled at the end of the ninth week of instruction of the quarter.

When an instructor has assigned a grade in a course in accordance with the Academic Senate policy on Integrity of Scholarship prior to the end of the ninth week of instruction, that grade may not subsequently be changed by dropping the course or withdrawing from the university.

## The In Progress (IP) Grade

For exceptional and compelling reasons, a course extending over more than one quarter may be authorized with the prior approval of the Committee on Educational Policy and Courses (for undergraduate courses) or the Graduate Council (for graduate courses). In such courses an evaluation of a student's performance may not be possible until the end of the final term. In such cases the instructor may assign the provisional grade IP (in progress).

IP grades shall be replaced by final grades if the student completes the full sequence. The instructor may assign final grades, grade points, and unit credit for completed terms when the student has not completed the entire sequence provided that the instructor has a basis for assigning the grades and certifies that the course was not completed for good cause. An IP not replaced by a final grade will remain on the student's record.

In calculating a student's grade-point average, grade points and units for courses graded IP shall not be counted. However, at graduation, courses still on the record as graded IP must be treated as courses attempted in computation of the student's grade-point average in assessing a student's satisfaction of Senate Regulation 634.

## The Incomplete (I) Grade

Academic Senate regulations state that the incomplete grade I for undergraduates shall be disregarded in determining a student's grade-point average except at point of graduation when students must have an overall 2.0 (C) on all work attempted at the University of California.

Students whose work is of non-failing quality but incomplete for good cause, such as illness, must file a Request to Receive/ Remove Grade Incomplete form.

1. Students should complete their portion of the request form, including the reason they are requesting the Incomplete which *must be for good cause*, such as illness.
2. The instructor has the option to approve or disapprove the request and should state on the form *how* and *when* the I is to be completed.
3. There is a \$5 processing fee payable to the Cashier's Office, which should be paid by the student *prior* to filing the form with the instructor.
4. Students must complete the work to remove the Incomplete on or before the date agreed upon with the instructor and in time for the instructor to assign a grade **before the end of finals week the following quarter**.
5. Failure to complete this work within the regulation time limit will result in the Incomplete lapsing to a *permanent* F, NP, or U grade.

## Extension of Incomplete

For justifiable reasons, such as illness, students can petition their provost or graduate office to extend the Incomplete past one quarter. These petitions must have the prior approval of the *instructor and the department chairperson*. The petition must include the reasons for requesting the extension and *how* and *when* the I is to be completed. These petitions must be filed **before** the Incomplete grade lapses to an F, NP, or U grade. *The extension cannot be made retroactively.*

An I grade may be replaced upon completion of the work required by a date agreed upon with the instructor, but no later than the last day of finals week in the following quarter. If not replaced by this

date, the I grade will lapse into an F, NP or U grade, depending upon the student's initial grading option.

A student who has received an I grade should *not* re-enroll in the course to make up the missing work. If the student were to re-enroll, the course would be considered a repeat and would not remove the prior quarter's Incomplete, which would lapse to a *permanent* F, NP, or U grade.

## Student Copy of Final Grades

The Office of the Registrar will mail copies of final grades to students as soon as possible at the end of each quarter. Fall and winter quarter grades will be mailed to the local mailing address on file for undergraduates and to the major department for graduate students. Spring quarter grades will be mailed to all students' permanent addresses. Students should examine this copy of their transcript record for accuracy and report any omissions or errors to the Office of the Registrar immediately.

## Transcript Requests

Application for an official transcript of record to be sent to another party or institution should be submitted to the registrar several days in advance of the time needed. An application for a transcript must bear the student's signature. A \$3 fee is charged per copy. Checks should be made payable to the Regents of the University of California.

## Grade Appeals

- A. 1. If a student believes that nonacademic criteria have been used in determining his or her grade in a course, he or she may follow the procedures described in this regulation.
2. *Nonacademic criteria* means criteria not directly reflective of academic performance in this course. It includes discrimination on political grounds, or for reasons of race, religion, sex, or ethnic origin.
3. Appeals to this committee [see (B)(4)] shall be considered confidential unless both the complainant and the instructor agree otherwise. They may agree to allow the student representatives to the committee to participate in the deliberations of the committee, or they may agree to open the deliberations to members of the university community.

- B. 1. The student may attempt to resolve the grievance with the instructor within the first month of the following regular academic quarter.
2. If the grievance is not resolved to the student's satisfaction, he or she may then attempt to resolve the grievance through written appeal to the department chairperson or equivalent, who shall attempt to adjudicate the case with the instructor and the student within two weeks.
3. If the grievance still is not resolved to the student's satisfaction, he or she may then attempt to resolve the grievance through written appeal to the provost of the college, the dean of Graduate Studies, or the dean of the School of Medicine, who shall attempt to adjudicate the case with the instructor, the chairperson, and the student within two weeks.
4. If the grievance is not resolved to the student's satisfaction by the provost or dean, the student may request consideration of the appeal by the CEP Subcommittee on Grade Appeals (hereinafter called the Committee) according to the procedures outlined below. This request must be submitted before the last day of instruction of the quarter following the quarter in which the course was taken.
- C. 1. The student's request for Committee consideration should include a written brief stating the nature of the grievance, including copies of any and all documents in his or her possession supporting the grievance. The submission of the brief to the Committee places the case before it and restricts any change of the challenged grade to a change initiated by the Committee, unless the Committee determines that all other avenues of adjudication have not been exhausted.
2. Upon receipt of the student's request, the Committee immediately forwards a copy of it to the instructor involved and asks the instructor, the department chairperson or equivalent, and the provost or dean for written reports of their attempts to resolve the complaint.

3. The Committee, after having determined that all other avenues of adjudication have been exhausted, shall review the brief and the reports to determine if there is substantial evidence that nonacademic criteria were used.
    - a. If the Committee finds substantial evidence that nonacademic criteria were used, it shall follow the procedure in paragraph (D) below.
    - b. If the Committee decides the allegations are without substance, it shall serve written notification of its findings to the complainant and to the instructor within two weeks. Within ten days the complainant or the instructor may respond to the findings and any member of the Committee may appeal the Committee's findings to the full Committee on Educational Policy and Courses. If there are no responses, or if after consideration of such responses the Committee sustains its decision, the grade shall not be changed.
- D. 1. If the Committee determines that there is evidence that non-academic criteria were used, it shall interview any individual whose testimony might facilitate resolution of the case. The complainant shall make available to the Committee all of his or her work in the course which has been graded and is in his or her possession. The instructor shall make available to the Committee all records of student performance in the course and graded student work in the course which is still in his or her possession. The complainant and the instructor shall be interviewed. At the conclusion of the case each document shall be returned to the source from which it was obtained.
2. The Committee shall complete its deliberations and arrive at a decision within two weeks of its determination that evidence of the use of nonacademic criteria had been submitted. A record of the Committee's actions in the case shall be kept in the Senate Office for three years.
3. If the allegations of the complainant are not upheld by a preponderance of the evidence, the Committee shall so notify the complainant and the instructor in writing. Within one week of such notification, the complainant and the instructor shall have the opportunity to respond to the findings and the decision of the Committee. If there are no responses, or if after considering such responses the Committee sustains its decision, it shall so notify the complainant and the instructor in writing and the grade shall not be changed.
  4. If the Committee determines that nonacademic criteria were significant factors in establishing the grade, it shall give the student the option of either receiving a grade of P or S in the course or retroactively dropping the course without penalty. A grade of P or S awarded in this way shall be acceptable towards satisfaction of any degree requirement even if a minimum letter grade in the course had been required, and shall not be counted in the number of courses a student may take on a P/NP basis. If the student elects to receive a grade of P or S, the student may also elect to have a notation entered on his or her transcript indicating that the grade was awarded by the divisional grade appeals committee.
    - a. The Committee shall serve written notification of its finding and its decision to the complainant and the instructor. The complainant and the instructor may respond in writing to the findings and the decision of the Committee within one week of such notification.
    - b. If there are no responses, or if after considering such responses the Committee sustains its decision, the grade shall be changed; the Committee shall then instruct the registrar to change the grade to P or S or, if the student elected the drop option, to retroactively drop the course from the student's record. Copies of the Committee's instruction shall be sent to the complainant and the instructor.
- E. These procedures are designed solely to determine whether nonacademic criteria have been used in assigning a grade, and if so to effect a change of that grade.
1. No punitive actions may be taken against the instructor solely on the basis of these procedures. Neither the filing of charges nor the final disposition of the case shall, under any circumstances, become a part of the personnel file of the instructor. The use of non-academic criteria in assigning a grade is a violation of the Faculty Code of Conduct. Sanctions against an instructor for violation of the Faculty Code may be sought by filing a complaint in accordance with San Diego Division By-Law §230(D). A complaint may be filed by the student or by others.
  2. No punitive actions may be taken against the complainant solely on the basis of these procedures. Neither the filing of charges nor the final disposition of the case shall, under any circumstances, become a part of the complainant's file. The instructor may, if he or she feels that his or her record has been impugned by false or unfounded charges, file charges against the complainant through the office of the vice chancellor for Undergraduate Affairs, the dean of Graduate Studies, or the associate dean for Student Affairs of the School of Medicine.

### **UCSD POLICY ON INTEGRITY OF SCHOLARSHIP**

The principle of honesty must be upheld if the integrity of scholarship is to be maintained by an academic community. The university expects that both faculty and students will honor this principle and in so doing protect the validity of university grading. This means that all academic work will be done by the student to whom it is assigned, without unauthorized aid of any kind. Instructors, for their part, will exercise care in planning and supervising academic work, so the honest effort will be encouraged.

## Academic Dishonesty

No student shall engage in any activity that involves attempting to receive a grade by means other than honest effort; for example:

No student shall knowingly procure, provide, or accept any materials that contain questions or answers to any examination or assignment to be given at a subsequent time.

No student shall complete, in part or in total, any examination or assignment for another person.

No student shall knowingly allow any examination or assignment to be completed, in part or in total, for himself or herself by another person.

No student shall plagiarize or copy the work of another person and submit it as his or her own work.

No student shall employ unauthorized aids in undertaking course work.

No student shall, without proper authorization, alter graded class assignments or examinations and then resubmit them for regrading.

Instructors should state the objectives and requirements of each course at the beginning of the term, clearly informing students what kinds of aid and collaboration on assignments are permitted. Students are expected to complete the course requirements in compliance with the standards described above.

## Procedures for Disposition of Cases of Academic Dishonesty

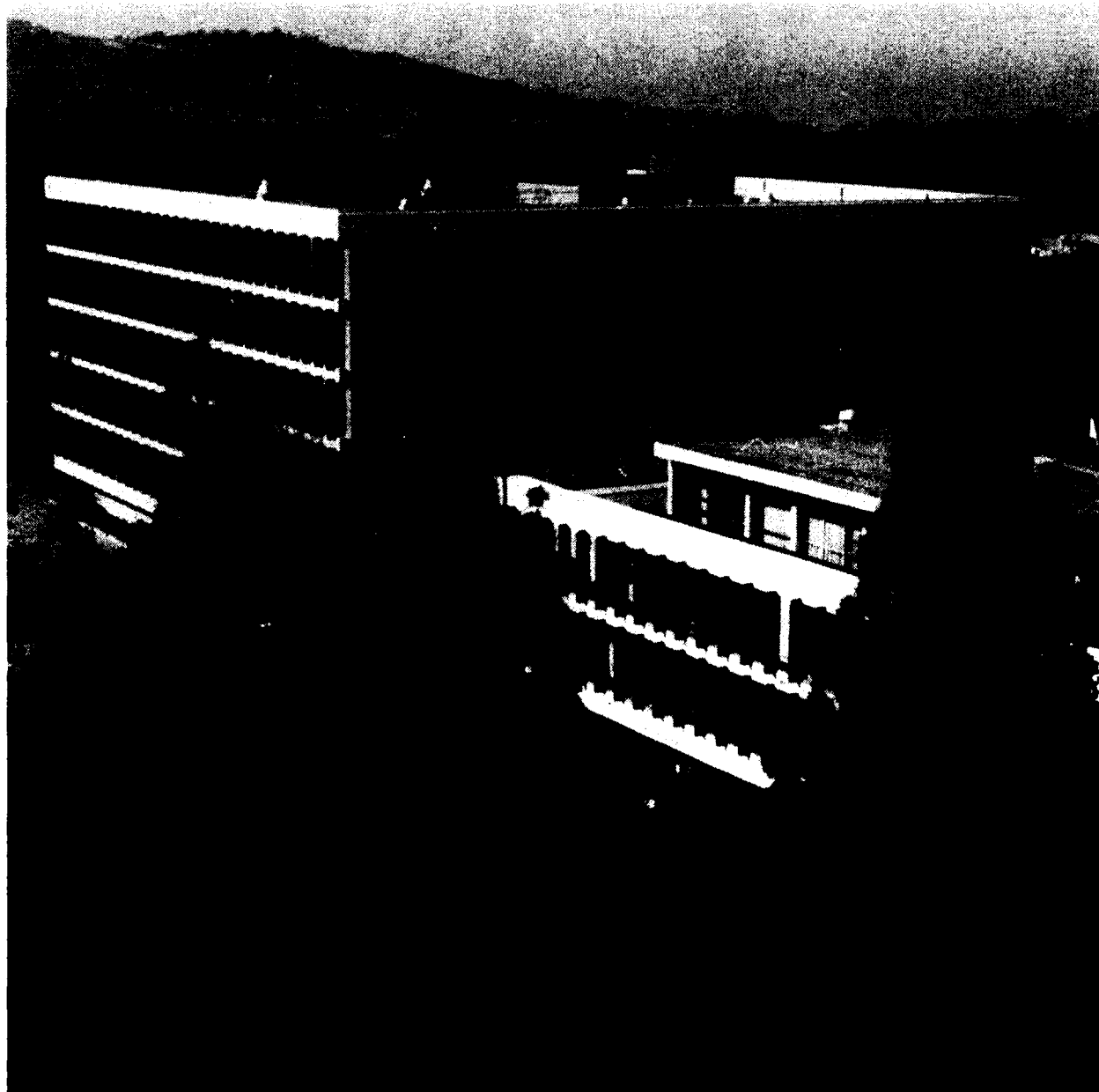
The primary responsibility for maintaining the standards of academic honesty rests with two university authorities: the faculty and the administration. When a student has admitted to or has been found guilty of a violation of the standards of academic honesty, two separate penalties shall be imposed. The officer of instruction in the course — hereinafter called the instructor — shall determine the student's grade on the assignment and in the course as a whole. The customary academic penalty for a serious breach of academic honesty results in failure in the course, although lesser penalties may be incurred in less serious circumstances.

The dean of the student's college (or the dean of Graduate Studies or the dean of students in the School of Medicine) shall impose an administrative penalty as well. The recommended administrative penalties are probation for the first offense and dismissal with a permanent record on the student's official university transcript for the second offense. The minimum administrative penalty is probation for one year and the establishment of a disciplinary record in the office of the appropriate dean.

The procedure for disposition of cases of academic dishonesty is divided into three phases:

A. *The Initial Phase:* When an instructor suspects a student of having committed a dishonest act in completing an assignment, he or she shall call the student to a meeting to discuss the charges, the evidence, and the proposed academic penalty. The appropriate college dean (or the dean of Graduate Studies or the dean of students in the School of Medicine) shall also be notified and shall then call the student to a meeting to discuss the case and the proposed administrative penalty. (Alternatively the instructor may choose to meet initially with the student and the dean together to discuss the case and the proposed academic and administrative penalties.) At the meeting with the dean the student shall be advised in writing by the appropriate dean of the charges and of his or her rights under the UCSD Policy on Integrity of Scholarship.

The student shall have ten calendar days following the meeting with the dean to decide whether to accept the proposed penalties, to appeal the dean's administrative penalty, or to proceed to a formal hearing. Unless the student informs the dean and the instructor otherwise within this ten-day period he or she shall be presumed to accept the proposed penalties. During this period a student may appeal the dean's administrative penalty as provided in paragraph D. The academic penalty shall be reviewed by the department chairperson. A record of the administrative and academic penalties imposed shall be maintained in the offices of the appropriate dean and the academic department in charge of the course.



**B. *The Hearing Phase:*** If within ten calendar days of his or her meeting with the dean the student denies having committed the alleged act of academic dishonesty and requests in writing a formal hearing, the case shall be referred to the chairperson of the department in which the alleged violation occurred. Within five calendar days the chairperson shall appoint an ad hoc committee composed of three faculty members from within the department or a related field and two students — either graduate students or seniors — from within or without the department to hear the case. The ad hoc committee shall hold a formal hearing within ten calendar days and decide on the basis of the preponderance of evidence whether the student did engage in academic dishonesty. A hearing officer, selected from a board constituted by the student conduct coordinator and college deans, shall conduct the hearing and shall advise the ad hoc committee on procedure, but shall not vote. The ad hoc committee shall be governed by the general university rules of procedural due process (latest edition of *University of California Policies and UC San Diego Campus Regulations Applying to Campus Activities, Organizations, and Students*). Within five calendar days, the hearing offices shall forward the Ad Hoc Committee's findings with explanations to the appropriate college dean, the dean of Graduate Studies, or the dean of students in the School of Medicine, with copies to the department chairperson, the instructor, and the accused student. Within five calendar days after receipt of the notice of the Ad Hoc Committee's final judgment in the case, the dean shall inform the student in writing of the findings of the committee and the academic and administrative penalties to be imposed.

If the ad hoc committee finds the evidence insufficient to sustain the charge of academic dishonesty, the dean shall dismiss the matter without further action against the student, who shall be permitted to complete the course or withdraw from it. If the student withdraws from the course, it shall not be listed on his or her transcript.

**C. *The Appeals Phase:***

1. Within three calendar days of receipt of the dean's letter, the student may appeal the dean's administrative penalty as provided in paragraph D. The academic penalty shall be reviewed by the department chairperson.
2. If the Ad Hoc Committee sustains the charge of academic dishonesty, the student may appeal that judgment in writing to the appropriate dean within fifteen calendar days. The basis for appeal of the Ad Hoc Committee's findings shall be:
  - a. that the standards of procedural fairness were violated, e.g., that the student did not have sufficient opportunity to present his or her side of the case, or the Ad Hoc Committee was improperly constituted; or
  - b. that there exists newly discovered important evidence which has substantial bearing on the findings of the Ad Hoc Committee. If the appeal is sustained, the case shall be referred back to the Ad Hoc Committee, reconstituted if necessary, for new hearing. Except for such appeals, the findings of the Ad Hoc Committee shall be final.

**D. *Request for Reduction of Administrative Penalty:*** An appeal of the dean's administrative penalty under the provisions of paragraphs A or C shall be directed by an undergraduate student to the provost of his or her college, by a graduate student to the dean of Graduate Studies, and by a medical student to the dean of the School of Medicine.

**E. *Other Governing Policy:***

1. If the case has not been adjudicated before the end of the quarter, the instructor shall give the student no grade in the course, but shall put a faculty hold in the memoranda column of the grade report. While the case is pending, the student may not drop the course in which he or she is accused of dishonesty.
2. If a case has not been adjudicated before the end of the quarter, the case may be continued the next regular academic quarter.
3. If the student withdraws from the university before the final disposition of the case, the following policy shall govern. If the student is found

to have committed an act of academic dishonesty, and the instructor assigns him or her a final grade in the course, this grade shall be permanently entered on the transcript. If the administrative penalty is dismissal, this fact shall be noted on the transcript. Any administrative penalty less severe than dismissal shall be imposed when the student returns to the university.

4. If the final decision in the case results in dismissal of the student, a record of the case and its outcome shall be established in the office of the vice chancellor for Undergraduate Affairs, the dean of Graduate Studies, or the vice chancellor for Health Sciences. The student's transcript shall bear the entry "Dismissed for Academic Dishonesty."

## **SPECIAL PROGRAMS**

### **Education Abroad Program**

Please refer to the "Courses, Curricula, and Programs of Instruction" section of this catalog where the Education Abroad Program is described in full.

### **Intercampus Transfer (ICT)**

An undergraduate in good academic standing who is now, or was previously, registered in a regular session at any campus of the University of California, and has not since registered at any other institution, may apply for transfer in the same status to another campus of the university.

#### **How to Apply:**

Intercampus transfers must complete the University of California Undergraduate Application form. These forms are available in the Office of the Registrar. You may apply to one or to as many as eight UC campuses of the university using one application form. Send your completed application to:

UNIVERSITY OF CALIFORNIA  
ADMISSIONS APPLICATION  
PROCESSING SERVICE  
P.O. Box 23460  
Oakland, California 94623-0460

Mail only your application form, fees, and essay to the processing service address above. Send your transcripts, test scores, and all other correspondence



relating to your application directly to the Admissions Office at the university campus(es) to which you apply. The processing service will not forward them.

### Application Fees:

The basic application fee of \$35 entitles you to apply to one university campus. If you apply to more than one campus, you must pay an additional \$20 for each campus you select. These fees are not refundable.

### When to Apply:

Priority dates for filing applications for intercampus transfer are identical to the application filing dates for new students: fall, November 1-30; winter, July 1-31; and spring, October 1-31. UC Berkeley fall semester, November 1-30; spring semester, July 1-31.

A campus will accept applications after the priority period only if it still has openings. If you apply after the priority filing period to a campus that is no longer accepting applications, the Admissions Application Processing Service will notify you by mail that your application will not be forwarded to that campus. In this case, you may receive a full or partial refund of the application fee.

### Intercampus Visitor (ICV)

Qualified undergraduates may take advantage of educational opportunities on other campuses of the University of California as an Intercampus Visitor (ICV). This program is designed to enable qualified students to take courses not available on their home campus, to participate in special programs, or to study with distinguished faculty members on other campuses of the university. Students who meet the following requirements should complete an application available in the Office of the Registrar.

1. An undergraduate student must have completed at least one year in residence on the home campus and have maintained a grade-point average of at least 2.0 (or equivalent) to apply as an Intercampus Visitor.
2. Approval of the appropriate provost office is required.

If students meet the above conditions, they should complete the ICV application form and return it to the Office of the Registrar on the home campus, on or before the appropriate deadlines listed above for an intercampus transfer (ICT). The ICV

application is subject to approval of the host campus.

A nonrefundable fee of \$35 is charged for each ICV application.

### ROTC

UCSD does not have an ROTC program. Students may, however, with the permission of their college, enroll in ROTC courses at another institution in conjunction with completing their degree programs at UCSD. Through an agreement with the Navy, Air Force and Army ROTC and the University of San Diego and San Diego State University, qualified students at UCSD may participate in the programs given at these universities.

ROTC courses are conducted on the campuses of the University of San Diego and San Diego State University (College of Extended Studies) for the Navy and USMC ROTC, and at San Diego State University for Army and Air Force ROTC. Field training is conducted off campus as is the Flying Instruction Program, which is conducted at a local civilian flying school. Summer training is required for all students during one or more summers.

Upon completion of the program and all requirements for a bachelor's degree at UCSD, cadets are commissioned as second lieutenants in the Air Force, Army and Marine Corps, or as ensigns in the Navy. Further information on these programs may be obtained from the ROTC adviser at the Aerospace Studies Department, 265-5545, and the Military Science Department, 265-4943, at San Diego State University or the Department of Naval Science, 260-4811, at the University of San Diego. Information pamphlets are available in the Office of the Registrar at UCSD.

### WITHDRAWAL/ABSENCE/ READMISSION TO THE UNIVERSITY

Students absent for no more than one quarter are considered to be continuing students and should contact the Office of the Registrar for registration information.

Undergraduates in good standing who are absent for two or more consecutive quarters must file an application for readmission no later than eight weeks prior to the beginning of the quarter at the Office of the Registrar, Matthews Administrative and Academic Complex 301. A nonrefundable fee of \$35 is charged. A student who seeks readmission to UCSD more

than three consecutive quarters after withdrawing from student status must either adhere to the graduation requirements at the time of readmission or those subsequently established.

Whereas a formal leave of absence request for undergraduates is not required at the completion of a quarter, students who wish to leave mid-quarter are required to complete the Undergraduate Application for Withdrawal or Leave form and file it with their college academic advising or dean's office. This form serves two purposes: (1) a refund of fees, if appropriate, see below; (2) automatic withdrawal from classes. (See also "The W Grade.") Students desiring to be absent are urged to consult with their provost's office. The provosts recognize the need for some students to "stop out" for a while. Each provost's office is prepared to deal, in a totally flexible manner, with any changes in the plans of the student, or with any problems the student may have.

Students who decide to withdraw after the completion of a quarter and before registration fees have been paid for a subsequent quarter need not file a Request for Withdrawal form since they will be automatically withdrawn.

### Refund Policy

#### New Undergraduate Students

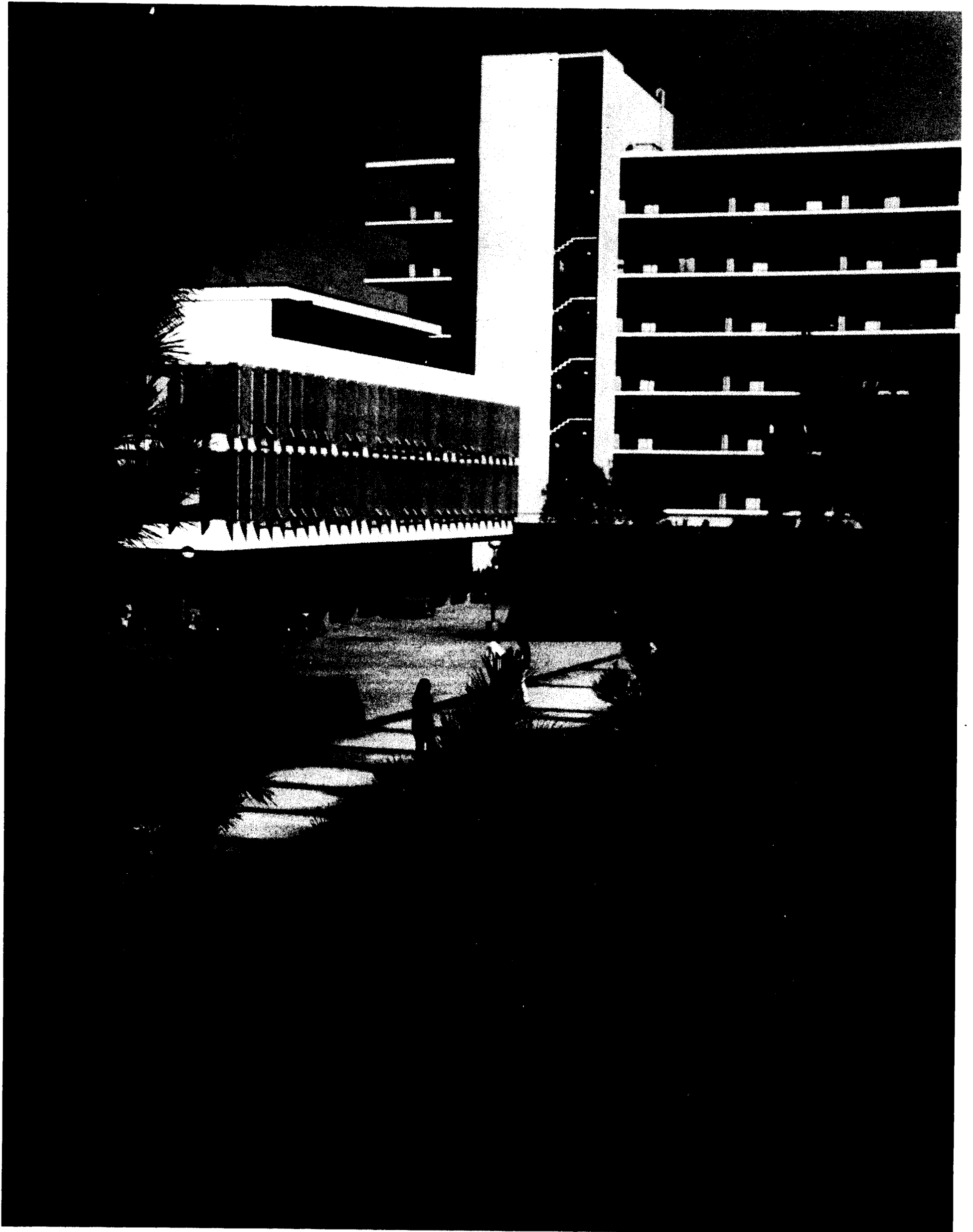
Prior to the first day of instruction, the registration fee is refunded minus the \$50 statement of intention to register fee.

#### Continuing and Readmitted Students

There is a service charge of \$10 for cancellation of registration or withdrawal before the first day of instruction. The following schedule of refunds is effective beginning with the first day of instruction and refers to calendar days:

| 1-14 days  | 15-21 days | 22-28 days | 29-35 days | 36 days and over |
|------------|------------|------------|------------|------------------|
| 80 percent | 60 percent | 40 percent | 20 percent | 0 percent        |

The effective date of withdrawal used in determining the percentage of fees to be refunded is the date on which the student submits his or her withdrawal form to the Office of the Registrar.





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# GRADUATE STUDIES

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At the University of California, San Diego, all programs leading to masters' degrees, and the doctor of philosophy degree are under the jurisdiction of the Graduate Council and are administered by the Office of Graduate Studies and Research.

The merging of administrative responsibilities for graduate studies and for research reflects the intention of the San Diego campus to emphasize the research character of graduate education.

Graduate studies involve more than the accumulation of credits. Although certain formal requirements exist, a plan of study cannot be programmed in advance simply by listing courses to be taken and by indicating the time to be devoted to research. There can be no guarantee that satisfactory research will be completed in any prescribed time. A Ph.D. degree is the culmination of creative effort; it attests to the ability of the recipient to continue original inquiry. In addition to requiring original research, the Office of Graduate Studies and Research strongly encourages all of its doctoral candidates to obtain teaching experience.

La Jolla has become one of the most important intellectual centers of the West. Not only has the university attracted many of the world's great scholars, but other research institutions such as the Salk Institute for Biological Studies and the Scripps Clinic and Research Foundation have enhanced the area's reputation. From the beginning UCSD was determined to offer intellectual opportunities not elsewhere available. Much of the training it offers takes place outside the classroom — not only in seminars but in independent research and in tutorial work. In addition to the permanent faculty, there are many visitors from other universities; there are opportunities to study at other campuses of the University of California; and there is frequent association between members of the university and those individuals who have come here to work within the research institutes at the UCSD campus.

## THE NATURE OF GRADUATE INSTRUCTION

Graduate courses demand, on the part of both instructor and student, a capacity for critical analysis and a degree of research interest not normally appropriate to undergraduate study. These courses generally carry a number in the 200 series and may be conducted in any of several ways: (1) as advanced lecture courses; (2) as seminars in which faculty and students present critical studies of selected problems within the subject field; (3) as independent reading or study under faculty supervision; or (4) as research projects conducted under faculty supervision. Graduate courses numbered 400-499 are designed for professional programs leading to degrees other than the M.A., M.S., M.F.A. or Ph.D. These courses may not be used to satisfy minimum graduate course requirements for degrees other than the M.P.I.A. Courses at the upper-division level (100-197) may be offered in partial satisfaction of the requirements for an advanced degree.

The graduate student is accorded considerable liberty in choice of courses as long as minimum departmental course standards and residence requirements are met.

Graduate study is structured to foster independent and original thought in the pursuit of knowledge.

## ADMINISTRATION

### The Office of Graduate Studies and Research

The Office of Graduate Studies and Research is administered by a dean appointed by the chancellor. The dean of Graduate Studies is responsible for graduate admissions, student degree programs, the administration of fellowships, traineeships, and other graduate student support, and the maintenance of common standards of high quality in graduate programs across the campus.

The dean reports to the vice chancellor of Academic Affairs and to the Graduate

Council, a standing committee of the Academic Senate, on the administration of graduate affairs.

### The Graduate Council

The Graduate Council is a standing committee of the San Diego Division of the Academic Senate composed of faculty and student representatives from graduate programs on the campus. The primary function of the council is to exercise overall responsibility for graduate study programs and to implement systemwide policies, procedures, requirements, and standards.

### The Graduate Adviser

The graduate adviser in a department, group, or school is appointed by the dean of Graduate Studies and is the person to whom graduate students may direct requests for information about graduate study in a particular program.

The graduate adviser's duties include:

1. Advising the dean on admission of graduate students.
2. Advising graduate students regarding their programs of study and other matters pertinent to graduate work.
3. Appointing individual advisers for each graduate student.
4. Approving official study lists.
5. Acting on the petitions of graduate students.
6. Insuring that adequate records are maintained on all graduate students in the department or group, and supplying relevant information as requested by the dean.
7. Assisting the dean of Graduate Studies in the application of university regulations governing graduate students, graduate study, and graduate courses.
8. Advising the chairperson of the department and the dean of Graduate Studies in the planning and construction of the graduate program in the department, group, or school.

### Graduate Degrees Offered 1987-88

|   |             |                               |               |
|---|-------------|-------------------------------|---------------|
| Anthropology  | Ph.D.*      | History                       | M.A., Ph.D.   |
| Biology   | Ph.D.       | International Affairs         |               |
| Biology<br>(Joint doctoral degree with<br>San Diego State University)             | Ph.D.       | Pacific International Affairs | M.P.I.A.**    |
|   |             | International Affairs         | Ph.D.**       |
| Chemistry   | Ph.D.*      | Linguistics                   | Ph.D.*        |
| Chemistry<br>(Joint doctoral degree with<br>San Diego State University)           | Ph.D.       | Literature                    |               |
| Clinical Psychology<br>(Joint doctoral degree with<br>San Diego State University) | Ph.D.       | Comparative                   | M.A., Ph.D.   |
| Cognitive Science   | Ph.D.†      | English and American          | M.A., Ph.D.   |
| Communication   | Ph.D.       | French                        | M.A., Ph.D.   |
| Comparative Studies in<br>Language, Society and<br>Culture                        | Ph.D.†      | German                        | M.A., Ph.D.   |
| Computer Science  | M.S., Ph.D. | Spanish                       | M.A., Ph.D.   |
| Earth Sciences  | Ph.D.*      | Marine Biology                | Ph.D.*        |
| Economics   | Ph.D.*      | Materials Science             | M.S., Ph.D.** |
| Electrical Engineering<br>(Applied Ocean Science)                                 | M.S., Ph.D. | Mathematics                   | M.A., Ph.D.   |
| (Applied Physics)   | M.S., Ph.D. | Mathematics (Applied)         | M.A.          |
| (Communication Theory<br>and Systems)   | M.S., Ph.D. | Statistics                    | M.S.          |
| Engineering Sciences  |             | Music                         | M.A., Ph.D.   |
| (Aerospace Engineering)   | M.S., Ph.D. | Neurosciences                 | Ph.D.*        |
| (Applied Mechanics)   | M.S., Ph.D. | Oceanography                  | Ph.D.*        |
| (Applied Ocean Science)   | M.S., Ph.D. | Philosophy                    | Ph.D.*        |
| (Bioengineering)  | M.S., Ph.D. | Physics                       | M.S., Ph.D.   |
| (Chemical Engineering)  | M.S., Ph.D. | (Biophysics)                  | Ph.D.         |
| (Engineering Physics)   | M.S., Ph.D. | Physiology and Pharmacology   | Ph.D.*        |
| (Mechanical Engineering)  | M.S.        | Political Science             | Ph.D.*        |
| (Structural Engineering)  | M.S.        | Psychology                    | Ph.D.*        |
| (Systems Science)   | M.S., Ph.D. | Sociology                     | Ph.D.*        |
| Engineering Sciences<br>(Applied Mechanics)                                       |             | Teaching and Learning         | M.A.          |
| (Joint doctoral degree with<br>San Diego State University)                        | Ph.D.**     | Theatre                       | M.F.A.        |
| Experimental Pathology  | Ph.D.       | Visual Arts                   | M.F.A.        |

\*The master's degree may be awarded to students pursuing work toward the Ph.D. after fulfillment of the appropriate requirements. See appropriate section of catalog.

\*\*Approval pending.

†Students who have completed some graduate study at UCSD and have been admitted to a doctoral program may apply for this interdisciplinary program.



## Graduate Student Association

The Graduate Student Association (GSA) is the officially recognized graduate student representative body at UCSD. It represents all graduate students — including those at Scripps Institution of Oceanography, the Graduate School of International Relations and Pacific Studies, and the School of Medicine — in academic, administrative, campus, and statewide areas. The GSA, composed of a chairperson, and two representatives from each department and school, nominates graduate student representatives for appointment to campus governing bodies and committees, including the Academic Senate, the Graduate Council, the Program Review Committee, the Registration Fee Committee, and the systemwide Student Body Presidents' Council. The GSA also sponsors group, department, school, and campus-wide graduate student projects and social activities. Association meetings are always open, and any graduate student may apply to the GSA for assistance in any graduate student matter.

## Graduate Student Affirmative Action

The University of California, San Diego is actively committed to recruiting and admitting students from those groups which have been traditionally underrepre-

sented as a result of economic, educational, or societal inequities.

The Graduate Student Affirmative Action Program provides an array of counseling and advocacy services to assist U.S. citizens and permanent residents from underrepresented groups in applying, securing admission, and successfully completing graduate degree programs.

Ethnic minority students and disabled students in graduate programs in all fields and women students in engineering and the sciences, where they are traditionally underrepresented, are eligible for awards through the San Diego and Graduate Opportunity Research Fellowship programs. Fellows currently receive \$750 per month (a combination stipend and research assistantship) plus tuition and/or fees. As an integral part of the fellowship experience, fellows are assigned a faculty mentor in their major department to assist them with their academic and research goals.

Other forms of financial support for subsequent years include teaching, research, and language assistantships.

For assistance and further information about special opportunities for ethnic minorities, for women (in science, engineering, and mathematics), and for physically handicapped individuals, contact the assistant to the dean for graduate student affirmative action, Office of Graduate Studies and Research, 409 Mat-

thews Administrative and Academic Complex, (619) 534-3871.

For information on Disabled Student Services for students at UCSD, see page 117.

## Career Services for Graduate Students

The Career Services Center offers a wide range of programs and services to assist graduate students with their career planning and job search needs. Individual career counseling is available on both an appointment and drop-in basis. In addition, workshops and special events are regularly offered covering such areas as resume writing, job search strategies, and nonacademic employment options. The Career Services Center also houses a career reference library containing information on employers, job listings, salaries, sample resumés, and publications pertinent to graduate students' career issues. For more information on Career Services, please see page 107.

## GENERAL REQUIREMENTS FOR HIGHER DEGREES

### Courses and Grades

Only upper-division and graduate courses in which a student is assigned grades A, B, C, (including plus [ + ] or minus [ - ]), D, or S are counted in satisfaction of the requirements for the master of fine arts, master of Pacific international affairs, master of arts, master of science, and doctor of philosophy degrees. An Incomplete grade, as well as an NR, will automatically lapse to an F or U if it has not been removed when the final report for the degree is approved by the Office of Graduate Studies and Research. (See also "Grades," page 87.)

Courses in the 400 series may be used in the program for the M.P.I.A.\* degree to be offered by the Graduate School of International Relations and Pacific Studies. Consult the bulletin of the school for information on courses and grading policy.

\*Administrative approval pending

## Registration in the Final Quarter for the Award of the Degree

A student completing course work, using university facilities including the library, or making any demands upon faculty time (other than final reading of the thesis or dissertation, or administering the comprehensive or doctoral examination), must register in the final quarter in which the degree is to be conferred. Students on an approved leave of absence may pay a filing fee in lieu of registration in the final quarter (see "Filing Fee," page 85).

## THE MASTER OF ARTS AND MASTER OF SCIENCE DEGREES

The master of arts and master of science degrees are offered under two plans: Plan I, Thesis Plan and Plan II, Comprehensive Examination. Since some departments offer both plans, with varying unit requirements, students should consult with their advisers before selecting a plan for completion of degree requirements.

### Programs of Study

#### PLAN I: THESIS PLAN

Following advancement to candidacy, the student electing Plan I must submit a thesis. The thesis committee, appointed by the chairperson of the department or group and approved by the dean of Graduate Studies, consists of at least three faculty members.

At least thirty-six quarter-units are required: eighteen units in graduate courses, including a minimum of twelve units in graduate-level courses in the major field; twelve additional units in graduate or upper-division courses; and six units in research course work leading to the thesis.

Information covering thesis preparation is contained in the publication, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses*, which is mailed to students electing Plan I, upon their advancement to candidacy. The completed thesis is submitted to the thesis committee for review.

When all members of the committee have approved the thesis, a Final Report of the Thesis for the Master of Arts or Master of Science Degree under Plan I



must be completed. Acceptance of the thesis by the university archivist (Special Collections) represents the final step in the completion of all requirements by the candidate for a master of arts or master of science degree on the San Diego campus.

#### PLAN II: COMPREHENSIVE EXAMINATION PLAN

Following advancement to candidacy, the student electing Plan II must pass a comprehensive examination administered by the major department. A Final Report of the Comprehensive Examination for the Master of Arts or Master of Science Degree under Plan II is used to report successful completion of the examination requirement.

At least thirty-six quarter-units are required: twenty-four units in graduate courses, including a minimum of fourteen units in graduate-level courses in the major field; and twelve additional units in graduate or upper-division courses.

### Academic Residence

The minimum residence requirement is three academic quarters, at least one of which must follow advancement to candidacy. Academic residence is met by satisfactory completion of six units or more per quarter, some of which must be graduate level.

A candidate must be registered in the final quarter in which the degree is to be awarded.

## Advancement to Candidacy

After completing all preliminary requirements of the major with a GPA equivalent to 3.0 in upper-division and graduate course work undertaken, with a total of no more than eight units of F and/or U grades, and a minimum of two quarters or more of residency, the student may file an Application for Candidacy for the Thesis or Comprehensive, Plan I or II, for the Master of Arts or Master of Science Degree. An application for candidacy must be filed no later than two weeks after the first day of the quarter in which degree requirements are to be completed. (See "Academic Calendar.")

## Graduate Work Completed at Other Campuses of the University of California

With the approval of the department concerned and the dean of Graduate Studies, upper-division and graduate course work completed with a grade of B- or better while in graduate standing at another campus of the University of California may be accepted in satisfaction of one of the three quarters of residence and up to eighteen quarter-units of credit required for the master of arts or master of science degree at UCSD.

## Graduate Work Completed Elsewhere

On the recommendation of the major department and with the approval of the dean of Graduate Studies, a maximum of eight quarter-units of credit for work completed with a grade of B- or better in graduate standing at an institution other than the University of California may be applied toward a master of arts or a master of science degree at UCSD.

## THE MASTER OF FINE ARTS DEGREE

The master of fine arts degree is offered under a modified thesis plan. A short written thesis that may be regarded as a position paper, presenting a descriptive background for the student's work, is required. There is no final examination, but great weight is given to the candidate's final presentation and the oral defense of the thesis.

## Program of Study

### PLAN III: MODIFIED THESIS PROGRAM

Following the filing of an Application for Candidacy for the Modified Thesis, Plan III, the candidate must submit a thesis. The thesis committee, appointed by the chairperson of the department and approved by the dean of Graduate Studies, consists of three faculty members (two from the department and at least one, preferably tenured, from a different department).

Seventy-two quarter-units for visual arts and ninety quarter-units for theatre, with a GPA equivalent to 3.0 in upper-division and graduate course work undertaken, are required for a master of fine arts degree. Information covering thesis preparation is contained in the publication, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses*, which is mailed to students upon their advancement to candidacy. The completed thesis is submitted to the thesis committee for review.

When all members of the committee have approved the thesis, a Final Report of the Modified Thesis Examination, Plan III, for the Master of Fine Arts Degree must be completed. Acceptance of the thesis by the university archivist (Special Collections) represents the final step in the completion of all requirements by the candidate for a master of fine arts degree on the San Diego campus.

### Academic Residence

The minimum residence requirement is six academic quarters for visual arts and eight academic quarters for theatre, at least one of which must follow advancement to candidacy in either program. Academic residence is met by satisfactory completion of six units or more per quarter, some of which must be graduate level. The entire residence requirement must be satisfied at UCSD.

A candidate must be registered in the final quarter in which the degree is to be awarded. (See "Registration in the Final Quarter," page 78.)

### Advancement to Candidacy

After completing all preliminary requirements of the department with a GPA equivalent to 3.0 in upper-division and graduate course work undertaken, with a total of no more than eight units of F and/

or U grades, and a minimum of five quarters of residency, the student may file an Application for Candidacy for the Modified Thesis, Plan III, for the Master of Fine Arts Degree. An application for candidacy must be filed no later than two weeks after the first day of the quarter in which degree requirements are to be completed. (See "Academic Calendar.")

### Graduate Work Completed Elsewhere

In exceptional circumstances, a student may be given a leave of absence for the purpose of studying elsewhere. While appropriate credit may be allowed for course work completed elsewhere with a grade of B or better in a graduate program, the period involved will not reduce the UCSD academic residence requirement of six academic quarters for visual arts and eight quarters for theatre.

### THE MASTER OF PACIFIC INTERNATIONAL AFFAIRS

The master of Pacific international affairs degree program is presently undergoing administrative review but will admit its first class for fall quarter, 1987. Please consult the Office of the Dean, Graduate School of International Relations and Pacific Studies for further information.

## THE DOCTOR OF PHILOSOPHY DEGREE

The doctor of philosophy degree is a research oriented degree which requires individual study and specialization within a field or the establishment of connections among fields. It is not awarded solely for the fulfillment of technical requirements such as academic residence and course work. Candidates are recommended for the doctorate in recognition of having mastered in depth the subject matter of their discipline and having demonstrated the ability to make original contributions to knowledge in their field of study. More generally, the degree constitutes an affidavit of critical aptitude in scholarship, imaginative enterprise in research, and proficiency in communication including — in most departments — practice in teaching.

### Program of Study

The student's program of study is determined in consultation with the adviser who supervises the student's activities until the appointment of the doctoral committee. A doctoral program generally involves two stages.

The first stage requires at least three quarters of academic residence and is spent in fulfilling the requirements established by the Academic Senate and by the



major department, group, or school (course work, teaching, departmental examinations, etc.). When the department considers the student ready to take the qualifying examination, it arranges for the appointment of a doctoral committee. Immediately upon passing the qualifying examination administered by the doctoral committee, the student advances to candidacy.

The second or in-candidacy stage is devoted primarily to independent study and research and to the preparation of the dissertation. A minimum interval of three quarters of academic residence should elapse between advancement to candidacy and the filing and final defense of the dissertation.

### Foreign Language Requirements

Some doctoral programs require candidates to demonstrate language proficiency in one or more languages, as part of the formal requirements for the Ph.D. degree. In these cases, the testing of proficiency is the responsibility of the department, group, or school concerned.

### Normative Time Program

All graduate students in doctoral programs are subject to normative time policies.

Normative time is a standard established for the time period in which students, under normal circumstances, are expected to complete requirements for the Ph.D. degree in a particular discipline. The normative times for Ph.D. programs at UCSD are listed below.

Students, in consultation with their faculty advisers, are expected to plan their programs of study for completion within the normative time period for their discipline.

University policy requires that graduate students be continuously registered — unless on an approved leave of absence — from the first quarter of enrollment to completion of degree requirements. (See "Continuous Registration" and "Leave of Absence," pages 95 and 96.)

In-candidacy educational fee grants are provided to students in the normative time program after advancement to Ph.D. candidacy and until the accrued time in graduate status exceeds the normative time. (See "Reduced Fee Enrollments," page 85.)

### Academic Residence

The minimum residence requirement for the doctor of philosophy degree is six quarters, three of which must be in continuous academic residence at UCSD. Residency is established by the satisfactory completion of six units or more per quarter, at least some of which must be at the graduate level.

A candidate must be registered in the final quarter in which the degree is to be awarded. (See "Registration in the Final Quarter," page 85.)

### The Doctoral Committee

At least two weeks prior to a scheduled qualifying examination, the department arranges for the appointment of the doctoral committee. This committee conducts the qualifying examination, supervises the preparation of and passes upon the dissertation, and administers the final examination.

The committee consists of five or more officers of instruction, no fewer than four of whom shall hold professorial titles of any rank. The committee members shall be chosen from two or more departments; at least two members shall represent academic specialties that differ from the student's major department, group, or school, and one of these two must be a tenured UCSD faculty member.

### Reconstituted Doctoral Committee

For a variety of reasons a doctoral committee may have to be reconstituted. The request for reconstitution of the membership of a doctoral committee (including departmental affiliation of the members of the proposed committee) together with the reasons for requesting the change must be submitted in writing to the dean of Graduate Studies by the chairperson of the candidate's major department, group, or school.

### Qualifying Examination and Advancement to Candidacy

The doctoral committee administers the qualifying examination and authorizes the issuance of the Report of the Qualifying Examination and Advancement to Candidacy for the Degree of Doctor of Philosophy. Formal advancement to candidacy requires the student to pay a candidacy fee to the cashier prior to submitting the form to the dean of Graduate Studies for approval. Students must maintain a GPA

equivalent to 3.0 or better in upper-division and graduate course work undertaken with a total of no more than eight units of F and/or U grades in order to take the qualifying examination and advance to candidacy.

If the committee does not issue a unanimous report on the examination, the dean of Graduate Studies shall be called upon to review and present the case for resolution to the Graduate Council, which shall determine appropriate action.

Normative time policy defines accrued time as elapsed time from first enrollment as a graduate student at UCSD, less (a) up to three quarters while on a formal leave of absence or withdrawn; and (b) time between completion of or withdrawal from one graduate program at UCSD and first registration in a different field of study. Time spent in graduate study at another institution or University of California campus prior to beginning graduate study at UCSD will not count toward accrued time, with the exception of the electrical engineering, computer science, or music programs. All of the following will count toward accrued time: time spent at UCSD as a master's, non-degree, or intercampus exchange graduate student; time spent on leave beyond three quarters; time spent between completion of or withdrawal from a graduate program at UCSD and re-registration in the same field of study. Each quarter spent in approved half-time study (six units or fewer) while in pre-candidacy studies will count as a half quarter in computing normative time limits.

A full description of normative time policies is given in the booklet *Normative Time to the Ph.D. and Associated Fee Grants*, October 1978 (Rev.), available in the Office of Graduate Studies and Research.

Occasionally, policy changes in the normative time program are made. Up-to-date information may be obtained from the Office of Graduate Studies and Research.



## NORMATIVE TIMES FOR DOCTORAL PROGRAMS

| Department/<br>Group/School/Program                     | Normative Time<br>Years | Department/<br>Group/School/Program               | Normative Time<br>Years |
|---|-------------------------|---|-------------------------|
| Anthropology  | 6                       | History   | 6                       |
| Applied Mechanics and<br>Engineering Sciences           |                         | International Affairs*                            | 5                       |
| (Aerospace Engineering)                                 | 5                       | Linguistics                                       | 6                       |
| (Applied Mechanics)                                     | 5                       | Literature  |                         |
| (Applied Ocean Science)                                 | 5                       | Comparative                                       | 6                       |
| (Bioengineering)  | 5                       | English and American                              | 5                       |
| (Bioengineering) Ph.D.-M.D.<br>program                  | 7                       | French  | 5                       |
| (Chemical Engineering)                                  | 5                       | German  | 5                       |
| (Engineering Physics)                                   | 6                       | Spanish   | 5                       |
| (Systems Science)                                       | 5                       | Materials Science*                                | 5                       |
| Biology   | 5                       | Mathematics                                       | 5                       |
| Biology Ph.D.-M.D. program                              | 7                       | Music   |                         |
| Chemistry   | 5 <sup>1/3</sup>        | With master's from another<br>university          | 4                       |
| Chemistry Ph.D.-M.D. program                            | 7                       | Without master's from another<br>university       | 6                       |
| Cognitive Science                                       | 6                       | Neurosciences                                     | 5                       |
| Comparative Studies in Language,<br>Society and Culture | 6                       | Neurosciences Ph.D.-M.D. program                  | 7                       |
| Communication   | 5                       | Philosophy  | 6                       |
| Computer Science  |                         | Physics   |                         |
| With master's from another<br>university                | 4                       | Theoretical Physics                               | 5                       |
| Without master's from another<br>university             | 5                       | Experimental Physics                              | 6                       |
| Economics   | 5                       | Physics<br>(Biophysics)                           | 6                       |
| Electrical Engineering                                  |                         | Physiology and Pharmacology                       | 5                       |
| (Applied Ocean Science)                                 |                         | Physiology and Pharmacology<br>Ph.D.-M.D. program | 7                       |
| (Applied Physics)                                       |                         | Political Science                                 |                         |
| (Communication Theory<br>and Systems)                   |                         | Without field study                               | 5                       |
| With master's from another<br>university                | 4                       | With field study                                  | 6                       |
| Without master's from another<br>university             | 5                       | Psychology  | 5                       |
| Experimental Pathology                                  | 5                       | Psychology Ph.D.-M.D. program                     | 7                       |
| Experimental Pathology Ph.D.-M.D. program               | 7                       | Scripps Institution of Oceanography               |                         |
|   |                         | Oceanography                                      | 6                       |
|   |                         | Earth Sciences                                    | 6                       |
|   |                         | Marine Biology                                    | 6                       |
|   |                         | Sociology   | 6                       |

\*Approval pending



## Dissertation and Final Examination

A draft of the doctoral dissertation should be submitted to each member of the doctoral committee at least four weeks before the final examination. The form of the final draft must conform to procedures outlined in the pamphlet, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses*, which is mailed to candidates upon their advancement to candidacy.

The doctoral committee shall supervise and pass on the candidate's dissertation and conduct the final oral examination which shall be public and so announced in the campus publication, *UCSD Times/Calendar*.

The Report of the Final Examination and Filing of the Dissertation for the Degree of Doctor of Philosophy form is initiated by the department, group or school, signed by members of the doctoral committee, the chairperson of the (major) department, group or school, and the university archivist (Special Collections), and approved by the dean of Graduate Studies.

The candidate files the dissertation with the university archivist (Special Collections), who accepts it on behalf of the Graduate Council. Acceptance of the dissertation by the archivist represents the final step in the completion by the candidate of all requirements for the doctor of philosophy degree.

## Candidate in Philosophy Degree

In several departments, as approved by the Graduate Council, the intermediate degree of candidate in philosophy (C.Phil.) is awarded to students upon advancement to candidacy for the Ph.D. degree. The minimum residence requirement for this degree is four quarters, at least three of which must be spent in continuous academic residence at UCSD. The C.Phil. degree cannot be conferred simultaneously with or following the award of a Ph.D. degree.

## Certificate of Completion

Upon request, the Office of Graduate Studies and Research will direct the Office of the Registrar to issue a Certificate of Completion to a graduate student who has completed all requirements for a higher degree but whose diploma has not yet been issued.

## Certificate of Resident Study/Foreign Students

In addition to a formal transcript, the Office of the Registrar will issue a Certificate of Resident Study to any foreign student whose visa status requires a return home before completion of studies in the United States. The student must have completed at least three quarters of full-time resident study not covered by a diploma or other certificate with a grade-point average of at least 2.5, and satisfactorily conducted a research program of at least nine calendar months' duration.

## Postgraduate Appointments

A UCSD graduate student is not eligible for any UCSD postgraduate appointment until all requirements for the Ph.D. degree have been completed. Such appointments may begin the day after the university archivist (Special Collections) has accepted the dissertation.

## SPECIAL DEGREE PROGRAMS

### Graduate Programs in the Health Sciences

The university offers research training programs in the health sciences leading to the doctor of philosophy degree. The purpose of these graduate programs is to prepare students for careers in research and teaching in the basic medical sciences. Program requirements are flexible, consisting of graduate courses and supervised laboratory or clinical investigation. Graduate programs in the health sciences are offered by (1) regular campus-wide departments with activities related to the health sciences, for example, the Departments of Applied Mechanics and Engineering Sciences, Biology, Chemistry and Psychology, and (2) interdisciplinary groups of faculty drawn from the School of Medicine and from campus-wide departments or from San Diego State University.

The following departments or interdisciplinary graduate groups provide research training opportunities in the biomedical sciences and should be contacted directly for further information: bioengineering, biochemistry (in either biology or chemistry), biology, biophysics, clinical psychology, experimental pathology, neurosciences, physics, physiology and pharmacology, psychology, and Scripps Institution of Oceanography.

## Ph.D.-M.D. Program

Students may meet the requirements for both the Ph.D. and M.D. degrees in programs offered jointly by the School of Medicine and the graduate programs in the health sciences. In most cases, students are first admitted to the School of Medicine and may then apply for admission to a relevant graduate program. However, those students who wish to be considered for admission to the Medical Scientist Training Program (MSTP) may apply for admission to the School of Medicine and the MSTP concurrently.

Elements of the first two years of the medical school curriculum satisfy many of the requirements of the graduate program, but additional courses will be required. Thus, the student must complete requirements for the Ph.D. in accordance with the regulations of a department or a group and must in addition meet the requirements for the professional degree. Students interested in such programs should consult the associate dean for Student Affairs, School of Medicine.

## Joint Doctoral Programs

Certain departments of the University of California cooperate with similar departments on the several campuses in the California State University System to offer joint programs of study leading to the Ph.D. degree. At UCSD, joint doctoral programs in biology, chemistry, and clinical psychology are currently offered in conjunction with San Diego State University. A joint doctoral program in engineering sciences (applied mechanics) is currently under review. Applicants interested in these joint programs should consult the Departments of Biology, Chemistry, Psychology, or the Office of the Dean, College of Engineering, at San Diego State University.

## SPECIAL PROGRAMS

### Intercampus Exchange Program for Graduate Students

An advanced graduate student registered on any campus of the University of California, who wishes to take advantage of educational opportunities for study and research available on another campus of the university, may become an intercampus exchange student on that UC campus.

Informal arrangements between departmental faculty on the two campuses should be undertaken prior to submission of a student's application to assure that space in desired courses, seminars, or facilities will be available.

No later than four weeks prior to the opening of the term on the host campus, a student must complete the Application for Intercampus Exchange Program for Graduate Students. This application, signed by the student's adviser and the graduate dean of the home campus, is forwarded for signature by the department and the graduate dean on the host campus.

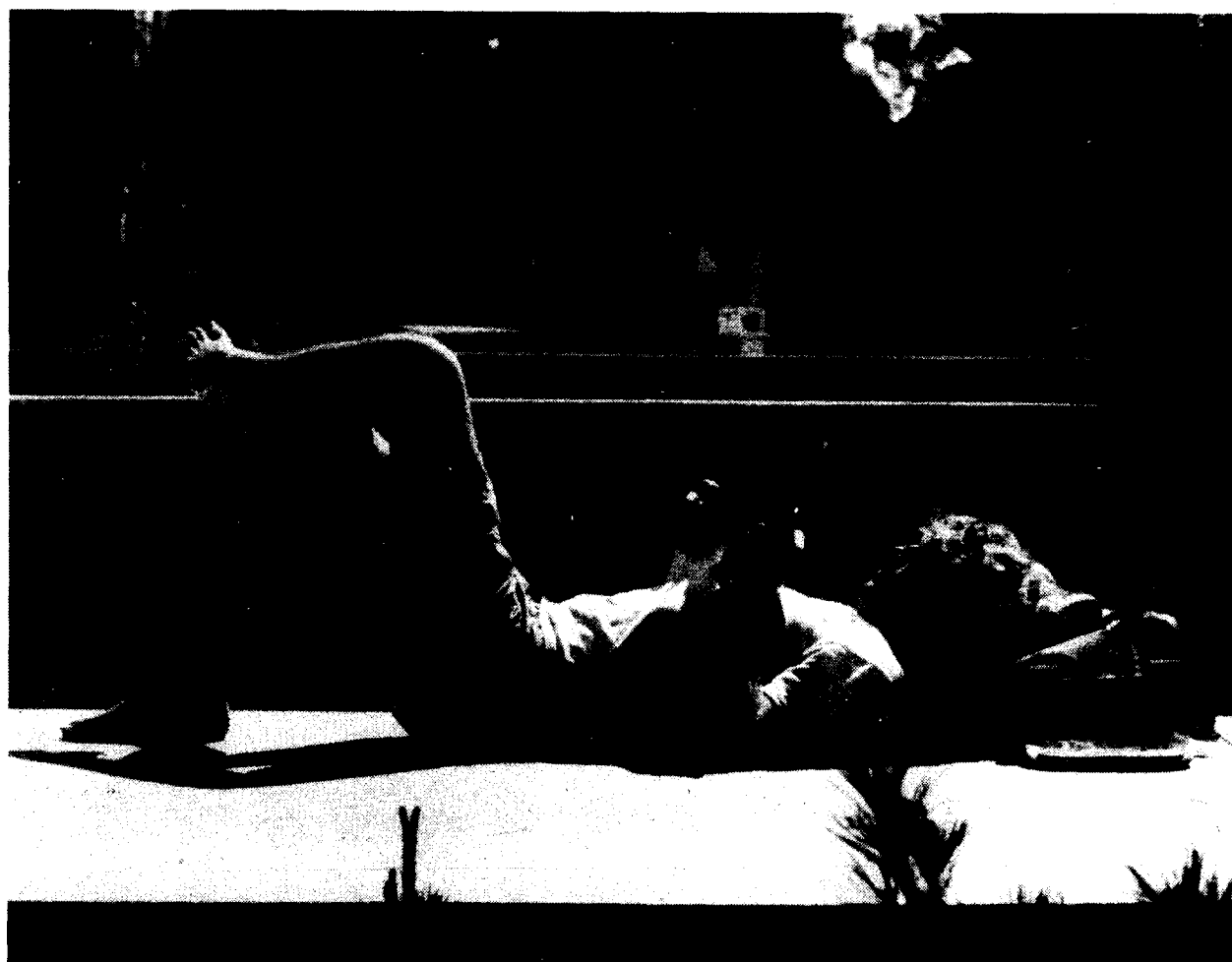
Registration is accomplished by the student registering and paying all required fees at the home campus, and then presenting a validated student photo-identification card to the Office of the Registrar on the host campus. In turn, the registrar will issue a Student Identification Card for the host campus.

An exchange student is not admitted to graduate standing at the host campus but is considered a graduate student in residence at the home campus. Grades obtained in courses taken by the student enrolled in the intercampus graduate student exchange program are transferred to the home campus for entry on the student's official record. Library, infirmary, and other student privileges are extended by the host campus.

### **West Coast Regional Consortium of Universities in the Neurosciences**

A consortium of twelve West Coast universities with neurosciences programs exists for the purpose of supplementing predoctoral and postdoctoral student research and training in the neurosciences through short-term utilization of laboratories and/or facilities which are not available at the home institution and may be available at participating universities.

Students who wish to take advantage of the opportunities for specialized training available through the consortium should first discuss their plans with their graduate adviser. Inquiries concerning availability of facilities and faculty time at prospective host campuses may be made to consortium committee members or directly to the faculty of the appropriate programs. Instructions and applications for participation in the Consortium Intercampus Exchange Program, and information about



possible financial assistance for travel involved may be obtained from the neurosciences graduate program.

The member universities of the consortium are: California Institute of Technology; Stanford University; campuses of the University of California at Berkeley, Davis, Irvine, Los Angeles, San Diego, and San Francisco; University of Oregon, Eugene; University of Oregon Health Sciences Center, Portland; University of Southern California; and University of Washington.

### **Off-Campus Study (Other than Intercampus Exchange Program)**

The research and study programs of graduate students may require them to be off campus for extended periods (five weeks or more). During such periods a student is required to remain a registered student at UCSD and to carry twelve units of course work or research.

If the off-campus study is outside the state of California, one-half of the registration fee may be waived. The full educational fee, student center fee, recreation facility fee and nonresident fee if applicable, must be paid.

A graduate student who holds a fellowship, traineeship, or a research assistantship and desires to study off campus may do so under the following circumstances: The student must have completed at least one year of graduate study at UCSD,

obtained the approvals of the major department and the dean of Graduate Studies, and agreed to comply with the rules and regulations governing the award or appointment.

Regulations concerning accepting additional awards or compensation for employment as outlined under the financial assistance section apply to off-campus study as well as on-campus study.

### **UCSD Extension**

Through a reciprocal agreement with UCSD Extension, a limited number of spaces in extension classes are open to registered graduate students without payment of additional fees. The number of spaces available for each quarter varies. The student must obtain a UCSD Application for Enrollment from the Office of Graduate Studies and Research, and personally secure the necessary approvals.

Students wishing to offer UCSD Extension course work in partial satisfaction of requirements for a master's degree must file a General Petition with the Office of Graduate Studies and Research. Acceptance of such course work is subject to the recommendation of the major department and approval of the dean of Graduate Studies.

## Education Abroad Program

This statewide program is coordinated on the San Diego campus by the Opportunities Abroad Office. Study abroad is presently available on campuses in Australia, Austria, Brazil, China, Costa Rica, Egypt, France, Germany, Hong Kong, Hungary, India, Ireland, Israel, Italy, Japan, Kenya, Korea, Mexico, New Zealand, Norway, People's Republic of China, Peru (Lima), Portugal, Spain, Sweden, Taiwan, the United Kingdom, U.S.S.R., and West Africa (Togo).

A graduate student is eligible for the Education Abroad Program after completion with a B average or better of one full academic year at a UC campus and two years of university-level work in the language of the country (if applicable). Students must submit an application to the appropriate office on their home campus accompanied by required supporting documentation.

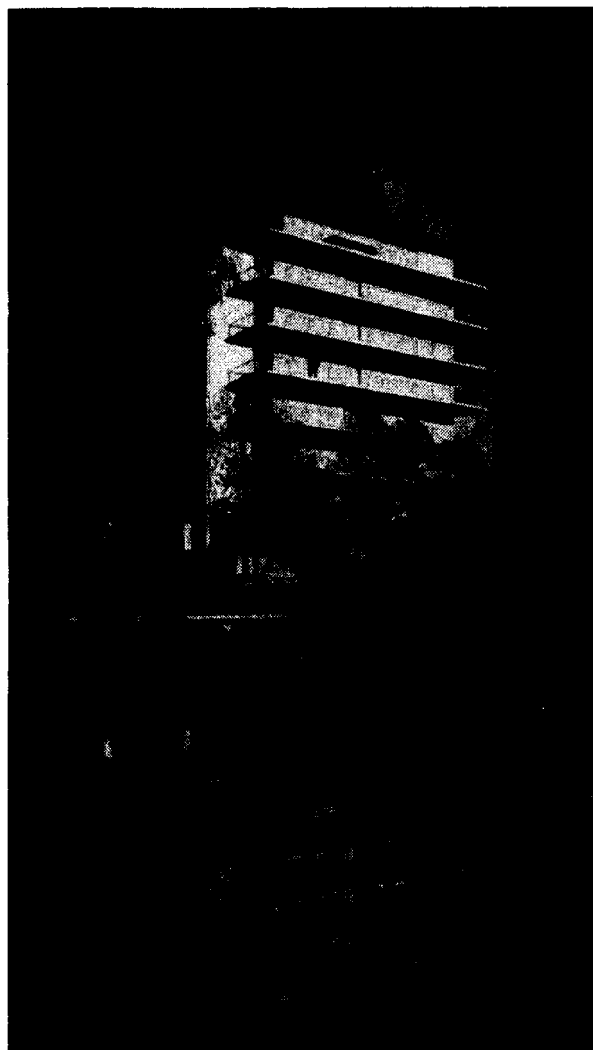
Selection procedures involve an interview with members of the Education Abroad Program Selection Committee on the student's home campus, the systemwide director of the Education Abroad Program, and a final acceptance by the host university.

Costs vary according to location. Teaching assistantships are available occasionally at some of the overseas campuses.

Students must register (pay fees) and enroll at their home campus and also enroll at the host university, and obtain clearance from their home campus student health service. Full academic credit is received for courses satisfactorily completed.

At UCSD, complete information and application forms for the various overseas campuses may be obtained from the Opportunities Abroad Office, International Center, Matthews Administrative and Academic Complex, Q-018. In addition, the Opportunities Abroad Office also offers information and advisory services to students (graduate or undergraduate) interested in pursuing other activities involving study, research, work, or travel abroad.

See also Education Abroad Program in chapter entitled "Courses, Curricula, and Programs of Instruction."



## Postdoctoral Study

Postdoctoral scholars, trainees, and fellows play a major role in UCSD's teaching and research programs. All interested candidates should make advance arrangements with the relevant department or research unit. The Office of Graduate Studies and Research has administrative responsibility for the enrollment and census of postdoctoral scholars undertaking training at UCSD. A scholar is enrolled by means of a Postdoctoral Study and Training Enrollment form initiated in the office of the faculty sponsor and forwarded to the Office of Graduate Studies and Research for approval, after which an identification card is issued. When a scholar has completed a period of postdoctoral study, the department at UCSD may request a Certificate of Postdoctoral Study from the Office of Graduate Studies and Research. This certificate will indicate the area of study and the dates enrolled.

Health Net, a prepaid health plan, is available for purchase by UCSD postdoctoral scholars. All scholars are required to enroll in Health Net unless they have adequate coverage through another health insurance program. Information on Health Net and enrollment procedures may be obtained from administrative offices of departments, groups, school, or organized research units.

## FEES

For the 1987-88 academic year, the following schedule of fees will apply:

### Fees Per Quarter\*

|                         | RESIDENT   | NON-RESIDENT |
|-------------------------|------------|--------------|
| Tuition                 | \$         | \$1,430.00*  |
| Registration fee        | 185.00     | 185.00       |
| Educational fee         | 268.00     | 268.00       |
| Student Center fee      | 37.50      | 37.50        |
| Recreation Facility fee | 12.00      | 12.00        |
| Totals                  | \$502.50*# | \$1,932.50*# |

### Miscellaneous Fees and Fines

Students should also be aware of the following charges:

|   |         |
|---|---------|
| Application fee for admission   | \$35    |
| Changes in Study List after announced deadline dates (Drop/Add Card)  | 3       |
| Duplicate Photo-ID card   | 10      |
| Petition for Readmission  | 35      |
| Removal of Grade "I"  | 5       |
| Advancement to Candidacy for Ph.D.                                    | 25      |
| Transcript of Record  | 3       |
| Late payment of fees (Late registration)                              | 50      |
| Late filing of enrollment cards (including Preferred-Program Request) | 50      |
| Returned check collection   | 10      |
| Filing fee  | 85      |
| Health Insurance, optional (required of foreign students)             | \$84.50 |

\* Subject to change without notice. All receipts for payments made to the cashier, whatever their nature, should be carefully preserved. Not only do they constitute evidence that financial obligations have been discharged, but they may be required to support a claim that certain documents or petitions have been filed.

# Fees for graduate students approved for enrollment in a half-time program (not to exceed six units) total \$368.50 for resident students and \$1,083.50 for nonresident students.

## California Residency and the Nonresident Tuition Fee

Each new student entering UCSD is required to submit a Statement of Legal Residence to the Office of the Registrar. No tuition is charged to students classified as residents of California. Nonresidents, however, are required to pay a quarterly tuition fee.

A complete statement covering California residence requirements, determination of residence for tuition purposes, and/or recognized exceptions appears on page 58, "Residence Requirements." Additional information may be obtained from the Campus Residence Deputy, Office of the Registrar, Building 301, Matthews Administrative and Academic Complex. No other university personnel are

authorized to supply information relative to residence requirements for tuition purposes.

To the extent funds are available, non-resident tuition may be granted to spouses and dependent, unmarried children under age twenty-one of university faculty members who are qualified for membership in the Academic Senate. Inquiries should be directed to the dean of the Graduate Division of the campus the student proposes to attend.

### University Registration Fee

The university registration fee is a quarterly fee required of all registered students, and it must be paid at the time of the student's registration. This fee is for services which benefit the student and are complementary to, but not part of, the regular instructional programs of the university. No part of this fee is refunded to students who do not make use of these services. Exemption from this fee may be granted to surviving children of certain deceased California fire fighters or police officers. Students who believe they may qualify for an exemption on this basis must consult with the Student Financial Services Office, Building 213, Matthews Administrative and Academic Complex, for a ruling.

### Supplemental Student Health Insurance Fee

UCSD students are eligible to purchase a Supplemental Student Health Insurance Plan. They may also purchase the same health insurance plan for their spouse and children. The plan provides for reasonably comprehensive medical protection, and, for registered students, covers services not available from the university Student Health Service. **Enrollment in the Student Supplemental Health Insurance Plan is required of all foreign students.**

### Educational Fee

The educational fee was established as a required fee for all students beginning with the fall quarter 1970. It is used to cover a variety of educational costs as determined by the regents. The educational fee may be reduced by one-half for students enrolled in six units or fewer (see "Part-time Study," page 92).

### Student Center Fee

Every student is required to pay a student center fee each quarter.

### Recreation Facility Fee

Every student is required to pay a recreation facility fee each quarter.

### Reduced Fee Enrollments

1. The In-Candidacy Educational Fee Grant under the normative time program provides an educational fee grant each quarter (currently \$268) for students who have advanced to candidacy for the Ph.D. degree. When the individual's accrued time in a program exceeds the normative time established for that degree by the major department or group, the candidate will resume paying full fees. (See "Normative Time Program" bulletin for complete information.)
2. One-half of the established registration fee may be waived for graduate students whose research or study requires them to remain outside the state of California throughout the quarter. Students must file a General Petition for this privilege. The reduction pertains to one-half of the registration fee only. A student must pay, in addition, the educational fee, student center fee, recreation facility fee, and nonresident tuition fee, if applicable.
3. Graduate students approved for enrollment in a half-time program (not to exceed six units) are eligible for a reduction in fees of one-half the educational fee, and, if applicable, one-half of the nonresident tuition fee.
4. A full-time employee who is not subject to nonresident tuition, who has worked full time for the university for at least six months prior to the latest date that registration will be accepted, and who meets the admission requirements of the university is eligible for two-thirds reduction of both the university registration fee and the university educational fee for up to nine units or three regular session university courses per quarter, whichever is greater. An employee so registered is ineligible for the services and facilities of the Counseling Center, gymnasiums, or the Student Health Services, other than those services to which the employee is regularly entitled (University of California Staff Personnel Policy 260.23). Authorization for this privilege is se-

cured from the Staff Personnel Office for staff employees, or from the Academic Personnel Office for individuals on academic appointments.

NOTE: In accordance with Academic Senate regulations, no voting member of the San Diego Division of the Academic Senate should be recommended for a higher degree from UCSD unless the dean of Graduate Studies shall have certified that all requirements for that degree have been met prior to the appointment to a rank carrying the voting privilege.

### Filing Fee

A student on an approved leave of absence who has completed all requirements except for the final reading of the dissertation or thesis or the taking of the final examination is eligible to petition to pay a filing fee in lieu of registering and paying all required fees in the final quarter. The filing fee applies to both residents and nonresidents. Students must apply for this privilege by means of a General Petition.

### Refund of Fees

Students who withdraw from the university during the first five weeks of instruction may receive partial refunds of fees and nonresident tuition (if applicable). The date of withdrawal, as related to the fee refund schedule, shall be the date on which notice of withdrawal is submitted to the Office of the Registrar. See *Schedule of Classes* for schedule of refunds.

### Parking Fee

Students who park motor vehicles (including motorcycles) on the campus are subject to parking fees. (See "Parking," page 120, in chapter entitled "Campus Services and Facilities.")

### Penalty Fees

Penalty fees (see "Fees," page 84) are charged for failure to comply with normal deadline dates. To avoid such fines, students should fulfill all requirements in advance of the deadlines listed in the Academic Calendar.

### Transcript Fees

Students may obtain transcripts of their UCSD records from the Office of the Registrar for \$3 for each copy. Transcripts must be requested several days in advance of date needed.

## FINANCIAL ASSISTANCE

Several kinds of financial assistance are available to graduate students at UCSD. These include fellowships and traineeships; assistantships in teaching, language instruction, and research; scholarships in full or partial payment of tuition and/or fees; and loans and grants-in-aid. Further details about these awards may be obtained from departmental, group, or school offices.

Descriptions in this section deal entirely with awards administered directly by the university. The terms *appointment* or *award* mean employment for compensation, award of a fellowship or scholarship, or any other formally recognized educational benefit.

Applicants for financial assistance should note the following: "Pursuant to Section 7 of the Privacy Act of 1974, applicants for student financial aid or benefits are hereby notified that mandatory disclosure of their Social Security number is required by the University of California to verify the identity of each applicant. Social Security numbers are used in processing the data given in the financial aid application; in the awarding of funds; in the coordination of information with applications for federal, state, university, and private awards or benefits; and in the collection of funds and tracing of individuals who have borrowed funds from federal, state, university, or private loan programs."

### Fellowships and Traineeships

Fellowship and traineeship stipends are awards granted for scholarly achievement and promise which enable full time students to pursue graduate studies and research leading to an advanced degree. Part-time students and non-degree students are not eligible.

The San Diego and Graduate Opportunity Research Fellowships will provide a stipend of \$375 per month and a partial RAship of approximately \$375 per month plus tax-free resident fees and nonresident tuition, if applicable. All other fellowship stipends are established by the departments, group, or school and may vary in period from one to twelve months and in stipend from \$100 to \$1,000 per month. A typical fellowship will provide from \$600 to \$800 per month for nine months for a total of \$5,400 to \$7,200, plus tax-free resident fees and nonresident tuition, if required. Awardees must

register for twelve units of upper-division and graduate-level work each quarter and must remain in good academic standing, as described under "Standards of Scholarship," page 87.

Fellows and trainees on twelve-month tenure are required to devote full time to graduate study and research during the summer as well as during the academic year. A brief resume of proposed summer graduate study or research, approved by the appropriate adviser, must be filed with the dean of Graduate Studies before the end of the spring quarter preceding the summer portion of the fellowship or traineeship tenure.

Some fellowships and traineeships offer the privilege of participation in the teaching or research programs of the university.

The principal types of fellowships at UCSD are the following:

1. Regents Fellowships
2. San Diego and Graduate Opportunity Research Fellowships
3. Fee Scholarships
4. Tuition Scholarships
5. Tuition and Fee Scholarships
6. U.S. Public Health Service Predoctoral Traineeships
7. Research Fellowships

### Assistantships

Graduate students may be employed by UCSD on a part-time basis as research assistants, teaching assistants, or language assistants.

Graduate students enrolled full-time (twelve units or more) may be employed 50 percent time (twenty hours/week) during the academic year and 100 percent time during the summer months. Students enrolled in a part-time program (fewer than twelve units) are eligible, at the discretion of the department, for 25 percent time appointments. Appointees must remain in good academic standing, as described under "Standards of Scholarship," page 87.

Teaching and language assistantships do not include payment for tuition and fees. Graduate students who are employed as research assistants are eligible for payment of tuition and fees if they have a minimum 25 percent appointment for the entire quarter for which tuition and fees are paid (or the dollar equivalent); have an appointment effective with the first week of instruction in the quarter for

which tuition and fees are paid; and are within the time limits for support described on page 87.

For U.S. citizens and permanent residents, exemption from withholding of federal income tax may be claimed on Form W-4, Employee's Withholding Allowance Certificate, if no tax liability was incurred the previous year and no tax liability is anticipated during the current year. This exemption must be revoked by filing a new Form W-4 either (1) within ten days from the time federal income tax liability is incurred for the year, or (2) on or before December 1 if it is anticipated that federal income tax liability will be incurred for the next year. A certificate for exemption from withholding will expire on February 15 of the year following unless a new Form W-4 is filed before that date. (See Form W-4 for further details.)

### Application Procedures

**Entering students** may obtain application materials from academic department, group, or school offices. Only one application form is needed to apply for graduate admission and for any of the following: fellowships, traineeships, scholarships, and assistantships (teaching, language, or research).

In order for an applicant to be considered for a fellowship, traineeship, or graduate scholarship for the ensuing academic year, an application for admission with financial aid and all supporting materials must be received by the deadline as listed in the Graduate Admission and Award Application. No assurance can be given that applications can be processed after stated deadlines. Applications for assistantships may be accepted after the deadline, but many departments offer assistantships at the same time they consider applications for fellowships. Therefore, applicants for these appointments are strongly urged to submit their applications as early as possible.

**Continuing and returning students** should consult with their departments.

### Award Notification

The awarding of fellowships and similar awards for the following academic year will be announced not later than April 1. UCSD subscribes to the agreement of the Council of Graduate Schools of the United States, under which successful applicants for awards are given until April 15 to ac-



cept or decline such awards. An award accepted from one of the member universities may be resigned at any time through April 15. However, an acceptance given or left in force after that date commits the student not to accept another appointment without first obtaining formal release for that purpose.

### Loans and Grants-in-Aid

An excellent package of grants-in-aid, work-study, and loans is available to graduate students who show evidence of financial need as determined by analysis of a completed Student Aid Application for California (SAAC).

See section on financial assistance in chapter entitled "Campus Services and Facilities."

### Time Limits for Graduate Student Support

A full-time graduate student may not serve as a teaching assistant, language assistant, or a reader on an annual salary (or any combination of these titles) for more than four years. In addition, the total length of time for all financial support administered by UCSD (excluding loans) may not exceed six years for a full-time Ph.D. candidate, ten quarters for a master of fine arts candidate, or seven quarters for a master of science or master of arts candidate.

### Fellowships and Loans from Outside the University

In addition to fellowships, traineeships, and loans administered by the university, other types of graduate student support are available through federal agencies and private foundations. Students wishing to explore such sources of support for their studies at UCSD are urged to consult one of the many directories available through the reference departments of large libraries in the United States, or the fellowship adviser in the Office of Graduate Studies and Research, 409 Matthews Administrative and Academic Complex. Most application deadlines occur in the fall or early winter. Among the many organizations which award fellowships to students at UCSD are the Alcohol, Drug Abuse and Mental Health Administration; the Ford Foundation; the Hertz Foundation; the Hughes Aircraft Company; IBM; the National Aeronautics and Space Administration; the National Science

Foundation; the Pharmaceutical Manufacturers Association Foundation; the Social Science Research Council; the Woodrow Wilson National Fellowship Foundation; and the National Graduate Fellows Program.

California residents may apply for a California State Graduate Fellowship through the California Student Aid Commission to assist in payment of the university registration fee, the student center fee, and the educational fee. The deadline for application is usually in February, and application materials and additional information can be obtained in mid-December from departmental offices, the Office of Graduate Studies and Research, or the Student Financial Services Office.

## GENERAL POLICIES AND REQUIREMENTS

### Integrity of Scholarship

Graduate students are expected to adhere to the highest standards of academic integrity and honesty. University policy on the integrity of scholarship is described on page 87.

### Student Conduct

Graduate students enrolling in the university assume an obligation to conduct themselves in a manner compatible with the university's function as an educational institution. Rules concerning student conduct, student organizations, use of university facilities, and related matters are set forth in *University of California, San Diego, Student Conduct Code*, revised September 1986, *University of California Policies and UC San Diego Campus Regulations Applying to Campus Activities, Organizations, and Students* (revised October 31, 1983), copies of which are available at the Office of Graduate Studies and Research.

### Student Appeals

Because department chairpersons — in consultation with faculty colleagues — have primary responsibility for maintaining the excellence of graduate programs, and because faculty within a department are in the best position to judge their students' academic performance, graduate student appeals of an academic nature (i.e., course grades, examination results) should first be made to the individual faculty member involved, and, if necessary, the department chairperson.

Graduate students may appeal a course grade only if they believe that nonacademic criteria were used in determining their grade. Students who wish to appeal a course grade should follow the procedure described in "Grade Appeals," page 87.

Graduate students who wish to appeal actions of individual faculty, departments, or administrators relating to their academic program or financial support may do so if:

1. They feel that due process was not followed in arriving at a decision which resulted in disqualification.
2. They feel that personal prejudice affected the academic judgment rendered.

Students wishing to appeal a decision on these grounds should address such appeals to the dean of Graduate Studies.

In resolving student appeals, the dean of Graduate Studies may seek a review and recommendation by the Graduate Council.

### Exceptions

A student may request an exception to the normal procedures and requirements governing graduate studies by submitting a General Petition, available from the department. The petition must state clearly the reasons for requesting the exception and bear all required approvals before being filed with the Office of Graduate Studies and Research.

## GRADES

### Standards of Scholarship

Only upper-division, graduate, and professional courses in which grades of A, B, C (including plus [ + ] or minus [ - ]), D, or S (Satisfactory) are earned can be counted in satisfaction of the requirements for a higher degree.

A student's grade-point average (GPA) is computed by dividing the total number of grade points earned by the total unit value of graded upper-division, graduate, and professional courses undertaken at the University of California with the exception of those undertaken in UCSD Extension. Grades of S, U, I, IP, NR, and W are excluded in computing a grade-point average. Lower-division course work must be taken on an S/U basis, and the units are not used in computing a graduate

student's grade-point average nor in satisfying program requirements for a higher degree.

Each department or group prepares, not later than the second week of each spring quarter, a detailed, written evaluation of each of its graduate students who has not advanced to candidacy for the Ph.D. or master of fine arts degrees. These evaluations are designed to inform students of their progress and to improve communications between faculty and graduate students. Evaluations are discussed with students who may elect to add written comments before signing the copy of the evaluation sent to the Office of Graduate Studies and Research. A student's signature on the evaluation indicates knowledge of the assessment but does not necessarily signify agreement.

To be in good standing academically a graduate student must meet departmental standards including a satisfactory pre-candidacy spring evaluation if applicable, maintain a GPA of 3.0 in upper-division, graduate and professional course work, and must not have accumulated more than a total of eight units of F and/or U grades overall, unless departmental standards specify more stringent grade requirements.

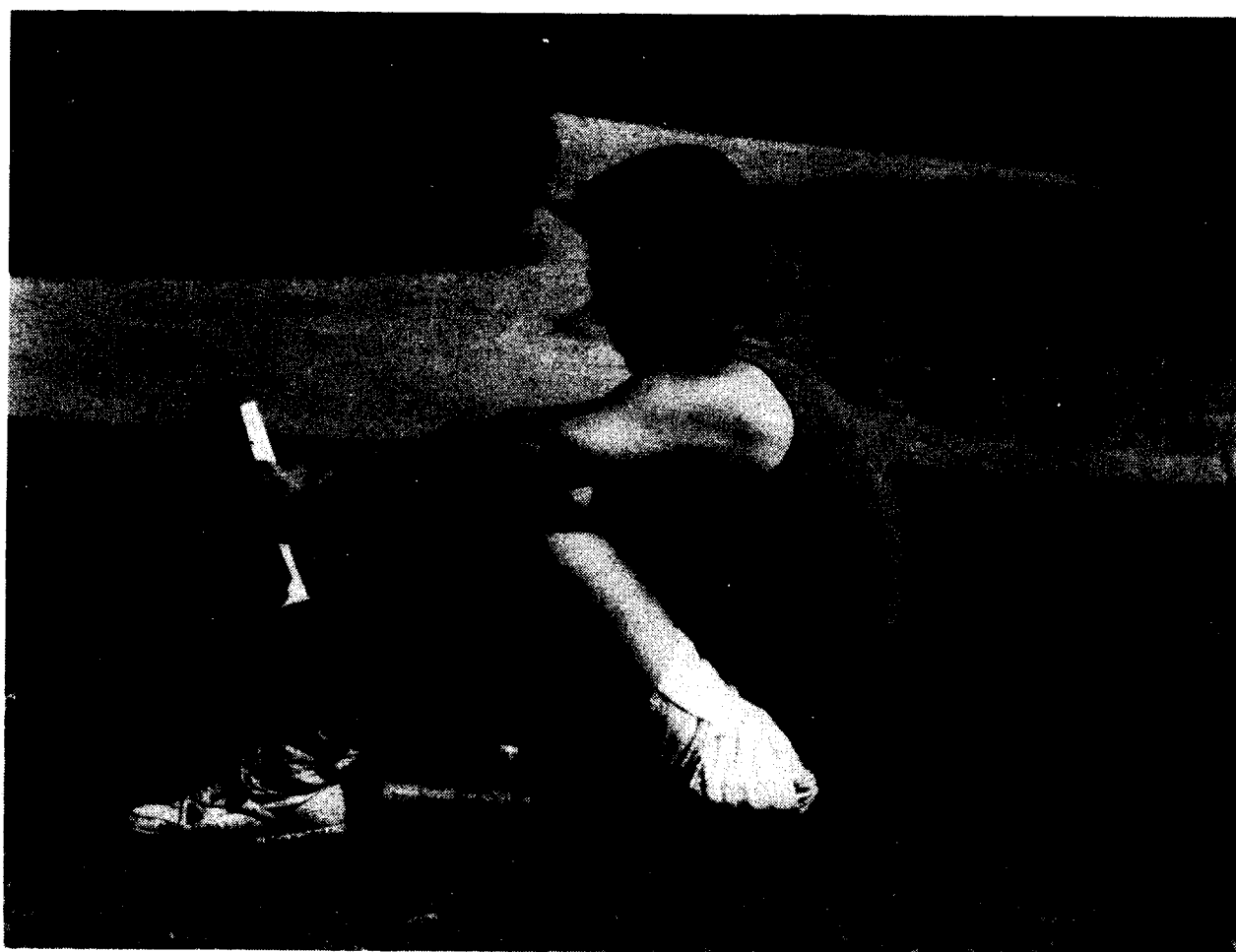
Good standing is a requirement for:

1. Holding academic and staff appointments.
2. Holding fellowship, scholarship, or traineeship appointments.
3. Advancing to candidacy for a graduate degree.
4. Going on leave of absence.
5. Receiving a graduate degree from UCSD.

Graduate students who are not in good standing for any reason are subject to probation and/or disqualification from further graduate study.

### **Grading System**

The grade of A +, when awarded, represents extraordinary achievement but does not receive grade-point credit beyond that received for the grade of A. The grades of A, B, and C may be modified by plus (+) or minus (-). When attached to the grades of B and C, plus (+) grades carry three-tenths of a grade point more per unit, and when attached to A, B, and C, minus (-) grades carry three-tenths of a grade point less per unit.



Grades and grade points are described as follows:

| <b>Grade</b>   | <b>Grade Points per Unit</b> |
|--|------------------------------|
| A +  | 4.0                          |
| A Excellent  | 4.0                          |
| A -  | 3.7                          |
| B +  | 3.3                          |
| B Good   | 3.0                          |
| B -  | 2.7                          |
| C +  | 2.3                          |
| C Fair   | 2.0                          |
| C -  | 1.7                          |
| D Poor   | 1.0                          |
| F Fail   | 0.0                          |
| S Satisfactory (equivalent to B - or better)   | 0.0                          |
| U Unsatisfactory   |                              |
| I Incomplete — but work of non-failing quality*  |                              |
| IP In Progress (provisional grade; replaced when full sequence is completed)   |                              |
| W Withdrawal (assigned when withdrawing or dropping a course beginning fifth week to end of ninth week of instruction) |                              |

\*Requires Request to Receive Grade Incomplete form to be initiated, and completed by the student, approved by the instructor, and filed with the department prior to the end of finals week. The Incomplete grade will lapse to F or U if not made up by the last day of finals week in the following quarter.

All grades except Incomplete and In Progress are final when entered in an instructor's course report filed at the end of the quarter.

While grades of U are not computed in a grade-point average, they are not considered satisfactory grades for students on appointment, nor are they considered to be evidence of satisfactory progress on the part of any student. Therefore, a student whose record bears more than eight units of U and/or F grades in upper-division, graduate, or professional course work may not be eligible to continue on appointment and may be subject to academic probation or dismissal.

### **Changes in Grades**

All grades except I and IP are final when filed by the instructor unless a clerical or procedural error is discovered.

No change of a final grade may be made on the basis of revision or augmentation of a student's work; no term grade except Incomplete may be revised by further examination; and no grade may be changed after one calendar year from the time the grade was recorded.

### **NR (No Report)**

An NR is a computer-produced abbreviation assigned by the registrar to indicate that the student was listed on a grade report, but no grade was entered by the instructor; or that the assigned grade did not agree with a grading option approved for the student. When an NR appears on



a record, the student should take steps immediately to remove the NR entry. An NR which has not been removed by the last day of finals week in the quarter after it was assigned shall lapse to a permanent F or U grade.

### I (Incomplete)

The grade of I may be assigned by an instructor only when the student's work is of passing quality but is incomplete for reasons beyond the student's control, e.g., illness, family emergency. The student must complete and submit to the instructor the form, Request to Receive Grade Incomplete and Removal of Grade Incomplete, which will contain both the reason for requesting the grade I and the conditions to be met before the Incomplete can be replaced with a final grade. The Incomplete must be made up, the grade assigned, and the completed form filed with the Office of the Registrar no later than the end of final examination week the following quarter.

For justifiable reasons such as illness or family emergency, a student may submit a General Petition to extend the Incomplete past one quarter. The petition must state the reason(s) for requesting the extension and *how* and *when* the Incomplete is to be completed. **The instructor (in lieu of the graduate adviser), the chairperson of the student's major department, and the Office of Graduate Studies and Research must approve the petition, and it must be filed with the Office of the Registrar no later than the last day of final examination week of the following quarter, or the Incomplete grade will lapse to an F or U grade. The extension cannot be made retroactively.**

Incomplete grades assigned in the quarter before a graduate student withdraws or takes an approved leave of absence must be either removed or extended before the end of the academic quarter following to prevent the Incomplete from lapsing to F or U.

### IP (In Progress)

An IP is assigned in a sequential course which extends over more than one quarter, and the evaluation of a student's performance may not be possible until the end of the course. A student who has dropped out without completing the entire sequence may be assigned final grades

and unit credit for any quarter(s) completed, provided that the instructor has a basis for assigning the grades and certifies that the sequence was not completed for good cause. An IP not replaced by a final grade will remain on the student's record. Courses graded IP are not used in calculating a student's grade-point average until graduation. At that time course units still graded IP on a student's record must be treated as units attempted in calculating the GPA; **thus units graded IP will be considered lapsed to F's or U's.**

### S/U (Satisfactory/Unsatisfactory)

The minimum standard of performance for a grade of Satisfactory shall be the same as the minimum for a grade of B - .

With the approval of the Graduate Council, departments may offer graduate courses in which graduate students may elect to be evaluated on an S/U basis and courses in which S/U grading shall be the *only* grading option. Grading options for a given course are identified in course listings in the *General Catalog*.

In addition, and with the approval of the department and the instructor concerned, graduate students may elect to have the following courses graded on an S/U basis: any upper-division course taken (provided they have obtained approval of the instructor and the department), and any graduate or upper-division course outside their major department. If departmental requirements have been fulfilled for advancement to candidacy for the Ph.D. degree, graduate students may take any course on an S/U basis. All lower-division course work and noncredit courses shall be graded only on an S/U basis.

Selection of S/U as a grading option **must be made in the first two weeks of a quarter.** Units graded Satisfactory shall be counted in satisfaction of degree requirements but shall be disregarded in determining a student's grade-point average. No credit shall be allowed for work marked Unsatisfactory.

### W (Withdrawal)

Students who discontinue graduate study during a quarter without formally withdrawing will receive failing grades for all course work undertaken. When a student withdraws before the end of the fourth week of instruction, no course entries will appear on the transcript for

that quarter. Students who withdraw from the university or drop a course between the beginning of the fifth week of instruction and the end of the ninth week of instruction will be assigned a W (Withdrawn) by the registrar for each course affected.

Courses in which a W has been assigned will be disregarded in determining a student's grade-point average.

### Repetition of Courses

A student assigned a grade of D, F, or U may repeat the course on the same grading basis for which it was first taken. That is, a course in which a grade of D or F has been received may not be repeated on an S/U basis. Conversely, a course in which a grade of U has been awarded may not be repeated on the basis of a letter grade. Degree credit for a course will be given only once, but the grade assigned for each enrollment shall be permanently recorded and used in calculating the overall grade-point average.

### Final Grades

An unofficial report of the quarter's grades is sent to each student at the end of fall and winter quarters. An unofficial copy of the complete transcript is sent to each student at the end of every spring quarter. While grade reports submitted by instructors at the end of the quarter are generally considered final, **students should carefully examine their grade report or transcript for omissions and clerical errors and consult with instructors and the Office of the Registrar to clarify any discrepancies.**

## ADMISSION REQUIREMENTS

### Academic

Applicants for graduate admission must present official evidence of receipt of a baccalaureate degree from an accredited institution of higher education or the equivalent, with training comparable to that provided by the University of California. A minimum scholastic average of B or better is required for course work completed in upper-division, or prior graduate study.

GRADUATE STUDIES

**UCSD LISTING OF DEPARTMENT /  
GROUP / SCHOOL PROGRAMS  
AND SPECIAL REQUIREMENTS  
1988-89**

| MAJOR CODES AND GRADUATE DEPARTMENTS/GROUPS/SCHOOLS  | DEPARTMENT MAIL CODE | LEADING TO THE DEGREE OF   | DEPARTMENT/GROUP/SCHOOL LIMITATIONS AND REQUIREMENTS   |  |  |   |
|--|----------------------|--|--|--|--|---|
|  |                      |  | ADMISSION LIMITED TO PARTICULAR QUARTERS   | APPLICATION DEADLINES  | GRE GENERAL AND/OR SUBJECT   | LETTERS OF RECOMMENDATION AND/OR OTHER  |
| DEPARTMENT OF ANTHROPOLOGY<br>063 Anthropology   | C-001                | Ph.D.*   | Fall only  | February 15  | Aptitude   | 3 Letters   |
| DEPARTMENT OF APPLIED MECHANICS and ENGINEERING SCIENCES<br>074 Applied Mechanics<br>074 Applied Mechanics<br>279 Aerospace Engineering<br>076 Applied Ocean Science<br>289 Bioengineering<br>295 Chemical Engineering<br>316 Engineering Physics<br>331 Mechanical Engineering<br>340 Structural Engineering<br>870 Systems Science | B-010                | J.D.P.**#<br>M.S., Ph.D.<br>M.S., Ph.D.<br>M.S., Ph.D.<br>M.S., Ph.D.<br>M.S., Ph.D.<br>M.S., Ph.D.<br>M.S.<br>M.S., Ph.D. | See below#<br>Fall only<br>Fall only<br>Fall only<br>Fall only<br>Fall only<br>Fall only<br>Fall only<br>Fall only | See below#<br><br><br>(January 15 for Financial Assistance and International Applicants)<br>See below3<br>See below3 | See below#<br>Aptitude<br>Aptitude<br>Aptitude<br>Aptitude<br>Aptitude<br>Aptitude<br>Aptitude<br>Aptitude | See below#<br>3 Letters<br>3 Letters<br>3 Letters<br>3 Letters<br>3 Letters<br>3 Letters<br>3 Letters<br>3 Letters<br>3 Letters |
| DEPARTMENT OF BIOLOGY (including Biochemistry)<br>116 Biology<br>124 Biology   | C-016                | J.D.P.#<br>Ph.D.   | See below#<br>Fall only  | See below#<br>January 15   | See below#<br>Aptitude (Adv. recommended)  | See below#<br>3 Letters   |
| DEPARTMENT OF CHEMISTRY (including Biochemistry)<br>154 Chemistry<br>153 Chemistry   | B-001                | J.D.P.#<br>Ph.D.   | See below#<br>Fall only  | See below#<br>February 1   | See below#<br>Aptitude & Adv.  | See below#<br>3 Letters   |
| GROUP IN CLINICAL PSYCHOLOGY<br>170 Clinical Psychology  | See below#           | J.D.P.#  | See below#   | See below#   | See below#   | See below#  |
| DEPARTMENT OF COMMUNICATION<br>184 Communication   | D-003                | Ph.D.  | Fall only  | February 1   | Aptitude   | 3 Letters   |
| DEPARTMENT OF COMPUTER SCIENCE and ENGINEERING<br>201 Computer Science   | C-014A               | M.S., Ph.D.  | Fall only  | January 15   | Aptitude   | 3 Letters   |
| DEPARTMENT OF ECONOMICS<br>246 Economics   | D-008                | Ph.D.*   | Fall only  | January 15, Financial Aid, April 1 all others  | Aptitude (Adv. recommended)  | 3 Letters   |
| DEPARTMENT OF ELECTRICAL and COMPUTER ENGINEERING<br>077 Applied Ocean Science<br>078 Applied Physics<br>180 Communication Theory and Systems  | C-014                | M.S., Ph.D.<br>M.S., Ph.D.<br>M.S., Ph.D.  | Fall only<br>Fall only<br>Fall only  | August 15<br>January 15<br>January 15  | Aptitude<br>Aptitude<br>Aptitude   | 3 Letters<br>3 Letters<br>3 Letters   |
| GROUP IN EXPERIMENTAL PATHOLOGY<br>350 Experimental Pathology  | M-012                | Ph.D.  | Fall<br>Winter   | March 1<br>October 1   | Aptitude & Adv.  | 3 Letters   |
| DEPARTMENT OF HISTORY<br>429 History   | C-004                | M.A., Ph.D.*   | Fall only  | January 15   | Aptitude   | 3 Letters   |
| IR/PS—GRADUATE SCHOOL OF INTERNATIONAL RELATIONS and PACIFIC STUDIES<br>000 Pacific International Affairs<br>000 International Affairs   | Q-062                | M.P.I.A.**<br>Ph.D.**  | Fall only<br>Fall only   | January 15<br>January 15   | Aptitude<br>(Adv. optional)<br>Aptitude  | 3 Letters***<br>3 Letters***  |
| DEPARTMENT OF LINGUISTICS<br>510 Linguistics   | C-008                | Ph.D.*   | Fall only  | January 15   | Aptitude   | 3 Letters   |
| DEPARTMENT OF LITERATURE<br>192 Comparative<br>522 English and American<br>523 French<br>525 German<br>528 Spanish   | D-007                | M.A., Ph.D.<br>M.A., Ph.D.<br>M.A., Ph.D.<br>M.A., Ph.D.<br>M.A., Ph.D.  | Fall only (Ph.D.)<br>All quarters (M.A.)   | January 15 (Ph.D.)<br>One month prior to the start of the quarter (M.A.)   | Aptitude & Adv.<br>Aptitude & Adv.<br>Aptitude & Adv.<br>Aptitude & Adv.<br>Aptitude & Adv.                | 3 Letters<br>3 Letters<br>3 Letters<br>3 Letters<br>3 Letters   |
| GROUP IN MATERIALS SCIENCE<br>000 Materials Science  | B-010                | M.S., Ph.D.**  | Fall only  | (January 15 for Financial Assistance and International Applicants)   | Aptitude   | 3 Letters   |
| DEPARTMENT OF MATHEMATICS<br>072 Applied Mathematics<br>540 Mathematics<br>891 Statistics  | C-012                | M.A.<br>M.A., Ph.D.<br>M.S.  | Fall only<br>Fall only<br>Fall only  | February 1, 4<br>February 1<br>February 1  | See below1<br>Aptitude & Adv.<br>Aptitude & Adv.   | 3 Letters<br>3 Letters<br>3 Letters   |

| MAJOR CODES AND GRADUATE DEPARTMENTS/GROUPS/SCHOOLS  | DEPARTMENT MAIL CODE | LEADING TO THE DEGREE OF | DEPARTMENT/GROUP/SCHOOL LIMITATIONS AND REQUIREMENTS |  |                              |  |
|--|----------------------|--------------------------|--|--|------------------------------|--|
|  |                      |                          | ADMISSION LIMITED TO PARTICULAR QUARTERS             | APPLICATION DEADLINES                            | GRE GENERAL AND/OR SUBJECT   | LETTERS OF RECOMMENDATION AND/OR OTHER       |
| DEPARTMENT OF MUSIC<br>579 Music   | B-026                | M.A., Ph.D.              | Fall only  | January 15                                       | Aptitude & Adv.              | 3 Letters; Supporting Musical Documents      |
| GROUP IN NEUROSCIENCES<br>594 Neurosciences  | M-008                | Ph.D.*                   | Fall only  | January 15, Financial Aid; March 1 all others    | Aptitude (Adv. recommended)  | 3 Letters                                    |
| DEPARTMENT OF PHILOSOPHY<br>651 Philosophy   | B-002                | Ph.D.*                   | Fall preferred                                       | See below†                                       | Aptitude                     | 3 Letters                                    |
| DEPARTMENT OF PHYSICS<br>666 Physics   | B-019                | M.S., Ph.D.              | Fall preferred                                       | March 1 (Fall), Oct. 1 (Winter), Jan. 2 (Spring) | Aptitude & Adv.              | 3 Letters                                    |
| GROUP IN PHYSIOLOGY/PHARMACOLOGY<br>676 Physiology and Pharmacology                          | M-013                | Ph.D.*                   | Fall only  | January 15                                       | Aptitude & Adv.              | 3 Letters                                    |
| DEPARTMENT OF POLITICAL SCIENCE<br>699 Political Science                                     | Q-060                | Ph.D.*                   | Fall only  | January 15                                       | Aptitude                     | 3 Letters                                    |
| DEPARTMENT OF PSYCHOLOGY<br>391 Psychology   | C-009                | Ph.D.*                   | Fall only  | January 2  | Aptitude                     | 3 Letters                                    |
| DEPARTMENT OF SCRIPPS INSTITUTION OF OCEANOGRAPHY<br>845 Scripps Institution of Oceanography | A-008                | Ph.D.*                   | Fall preferred                                       | January 15                                       | Aptitude                     | 3 Letters                                    |
| DEPARTMENT OF SOCIOLOGY<br>867 Sociology   | C-002                | Ph.D.*                   | Fall only  | January 15                                       | Aptitude                     | 3 Letters; Copies of term papers recommended |
| GROUP IN TEACHER EDUCATION<br>898 Teaching and Learning                                      | D-002                | M.A.                     | Spring only  | January 15                                       | Aptitude <sup>5</sup>        | 3 Letters <sup>5</sup>                       |
| DEPARTMENT OF THEATRE<br>565 Theatre   | B-044                | M.F.A.                   | Fall only  | January 31                                       | Aptitude & Adv. <sup>2</sup> | 3 Letters, Audition, Interview               |
| DEPARTMENT OF VISUAL ARTS<br>924 Visual Arts   | B-027                | M.F.A.                   | Fall only  | January 15                                       | Not required                 | 3 Letters <sup>6</sup>                       |

\* The master's degree may be awarded to students pursuing work toward the Ph.D. after fulfillment of the appropriate requirements.

\*\* Pending approval.

\*\*\* Supplementary application materials required. GMAT, LSAT scores if available, but not mandatory.

1 Not required for M.A. program in applied mathematics, unless student is requesting financial support.

2 Except for acting. Subject test in literature required for those students applying to the program in directing.

3 August 1 for domestic students not requesting financial assistance.

4 June 1 for international applicants and August 1 for U.S. citizens and permanent residents if not requesting financial support.

5 GRE score must be recent; current teaching or educational assignment for the duration of the graduate program; a current *California* teaching credential.

6 Original or reproductions of work, i.e., slides, films, video cassette, or critical papers; three-page statement of purpose.

# For information and application materials for all Joint Doctoral Programs please write to: Graduate Division, San Diego State University, San Diego, CA 92182. PLEASE NOTE THESE ADMISSIONS MATERIALS ARE TO BE COMPLETED FOR THE JOINT DOCTORAL PROGRAMS ONLY AFTER STUDENTS HAVE BEEN ADMITTED TO THE PROGRAMS BY SAN DIEGO STATE UNIVERSITY.

†APPLICATION DEADLINES

Fall Quarter  
Winter Quarter  
Spring Quarter

U.S. CITIZENS AND PERMANENT RESIDENTS

August 1  
November 1  
February 1

INTERNATIONAL APPLICANTS

June 1  
September 1  
December 1

## ADMISSION POLICIES

### Duplication of Advanced Degrees

Normally, duplication of advanced degrees is not permitted. A professional degree is not regarded as a duplication of an academic degree.

### Non-Degree Study

There is no "student-at-large" classification at UCSD; application for admission must be made to a specific department or group. Applicants who wish to enroll for "course work only" within a department or group and who do not intend to pursue a higher degree at UCSD may request admission for non-degree study. Applicants for non-degree study must satisfy all admission requirements and are not eligible for fellowships or assistantships.

### Part-Time Study

Students who enroll in fewer than twelve graduate or upper-division units each quarter are considered part-time students. Students, who are approved by their major department and by the dean of Graduate Studies for enrollment in a program of half-time study (maximum of six units or fewer) for reasons of occupation, family responsibilities or health, may be eligible for a reduction in fees. All other part-time students must pay the same fees as full-time students.

Less than full-time study may be pursued in several masters' programs and a few Ph.D. programs at UCSD. In all instances, students must satisfy the same admission requirements as full-time students and are eligible, at the discretion of a department, for appointment to 25 percent time teaching or research assistantships.

## APPLICATION PROCEDURES

### When to Apply

Applicants for admission who wish to be considered for a fellowship, traineeship, graduate scholarship, or assistantship should refer to "Financial Assistance — Application Procedures." All other applicants should apply by the department, group, or school deadline specified for admission as indicated on page vi.

Applicants need not have completed their undergraduate programs in order to

apply. However, when an applicant's grades or preparation appear to be marginal, the department, group, school, or the Office of Graduate Studies and Research may defer action upon an application until a supplementary record or evidence of the receipt of a degree becomes available.

### How to Apply

Applicants must complete an Application for Graduate Admission and Award and forward it, together with a nonrefundable application fee of \$35, to the Office of Graduate Admissions, Q-003, UCSD, La Jolla, California 92093. (Only one application is needed to apply for admission to graduate study and for a fellowship, traineeship, scholarship, or assistantship.) Detailed instructions as to how to complete the application appear within the application booklet. Listed below are the documents which are required in support of an application for graduate admission.

Information on supplemental application forms and supporting documents required for consideration for admission to the Graduate School of International Relations and Pacific Studies may be received by addressing a request to the Admissions Committee, IR/PS, Q-062, UCSD, La Jolla, California 92093.

### Social Security Number Disclosure

Pursuant to the Federal Privacy Act of 1974, applicants are hereby notified that disclosure of their Social Security number is mandatory. The Social Security number entered on the application for graduate admission is used as the applicant's identification number in the UCSD graduate student record-keeping system. This record-keeping system was established prior to January 1, 1975 pursuant to the authority of the Regents of the University of California under Art. IX, Sec. 9 of the California Constitution.

### Required Supporting Documents

All supporting documents — including letters of recommendation — should be forwarded directly to the applicant's prospective major department, group or school.

**Academic Records** — Applicants must request that official transcripts of all previous academic work, including certification of degrees received or documenta-

tion of status upon leaving each institution, be forwarded to their prospective major department. Transcript labels are enclosed in the application packet for this purpose. Applicants should insert the name and address of their proposed major department, group or school, leaving a transcript label with the registrar of an issuing institution. Only official records bearing the signature of the registrar and the seal of the issuing institution will be accepted. Applicants with academic work in progress who expect to complete a degree program before the intended date of enrollment at UCSD **must submit evidence of degree conferral** (as well as a final academic record) as soon as it is available.

**Special Note to Foreign Applicants** — In all applications for graduate admission, official records bearing the signature of the registrar or other responsible academic officer and the seal of the issuing institution are preferred. However, true copies, facsimiles, or photostatic copies of **foreign academic records** will be accepted if, after the copies have been made, they have been personally signed and stamped by an educational official **who certifies that they are exact copies of the original document**. Properly signed copies should be sent instead of irreplaceable original documents. Unless academic records are issued in English by the institution itself, English translations must accompany official documents written in a language other than English.

Foreign academic records should show all courses attended each year, examinations passed, seminars completed, and grades or marks received in all institutions where formal records are maintained. Official evidence of degree conferral must also be supplied, together with evidence of rank in class if possible.

**Graduate Record Examinations (GRE) Scores** — Applicants who are applying for admission to a department, group, or school which requires that they take the GRE (see Graduate Application for Admission and Financial Aid Information and Instruction Sheet) should do so as early as possible to insure the timely receipt of their score results. **Applicants must take the GRE no later than December in order to meet most departmental deadlines for admission.** The GRE is administered five times a year in the United States and in 133 other countries. In addition, several administrative

service tests are given each year in major U.S. cities (dates change). Applications may be obtained from the Educational Testing Service, Box CN 6000, Princeton, New Jersey 08541-6000.

To facilitate the processing of applications for admission, applicants may wish to forward to their proposed major department, group, or school a copy of their GRE examination score as soon as it is received, since official copies are not always received by the appropriate office at UCSD.

#### **Letters of Recommendation —**

Applicants should arrange to have three letters of recommendation forwarded directly to their prospective major department, group, or school. (Recommendation forms are included in the application booklet.) Only one set of recommendation letters need be submitted in support of an application for admission and fellowship or assistantship consideration. It is most important that letters of recommendation be completed by individuals in a position to analyze an applicant's abilities and academic or professional promise. Applicants who have applied within the last two years, but did not enroll, should check with their major department or group to determine if letters of recommendation are still on file.

**Foreign Applicant Financial Statement — Foreign applicants are required to certify that they possess sufficient funds to cover all fees, transportation, and living expenses during the first academic year of graduate enrollment at UCSD.** In addition, they must certify as to the probability of funds for subsequent years of study. A Foreign Applicant Financial Statement, for the purpose of indicating the amount and source of funds available for graduate study, is forwarded to foreign applicants upon receipt of a completed application. A written summary of present and future financial resources must be provided before visa forms can be granted.

Opportunities for employment on or off campus, are extremely limited, and foreign applicants should not base their educational plans on the hope of finding employment after arriving in the United States.

**Test of English as a Foreign Language (TOEFL) —** All foreign applicants whose native language is not English and whose undergraduate education was conducted in a language other than

English must take the TOEFL and submit their test scores to the Office of Graduate Admissions. The TOEFL is offered one day each month throughout the world. Arrangements for taking the TOEFL may be made through the nearest United States Embassy or by writing to the TOEFL Services, CN 6151, Princeton, New Jersey 08541-6151.

Applicants who are admitted with a total TOEFL score of less than 550 may be required to take an English proficiency test upon arrival at UCSD and to enroll in an English course until the required proficiency is attained.

Foreign applicants who wish to be considered for a teaching assistantship are urged to submit scores on the Test of Spoken English (TSE), which is given at TOEFL test centers throughout the world (approximately 185 countries), one day each month (dates change each year).

## **ADMISSION AND REGISTRATION**

Official admission to graduate study at the university is contingent upon review of an applicant's record, an affirmative recommendation by the prospective department, group, or school and action by the Office of Graduate Studies and Research. The dean of Graduate Studies or the prospective major department, group or school may deny admission if an applicant's scholastic record is undistinguished, if the preparation is judged inadequate as a foundation for advanced work, or in the event that no further students can be accommodated for a given quarter. **Only the official Certificate of Admission from the dean of Graduate Studies constitutes formal approval of admission to a graduate program at UCSD.**

Official notification of admission by the dean of Graduate Studies will be mailed well in advance of the beginning of the quarter for which application has been made. Applicants should call their prospective major department, group, or school if formal notification is not received four weeks prior to the beginning of the quarter for which they applied.

Admission to graduate standing does not constitute registration for classes. A student is not officially registered for classes until the entire registration procedure is completed each quarter. Information and all necessary registration materials will be available at department and

group offices approximately two weeks before the opening of the quarter (see "Academic Calendar").

## **Reapplication**

Students who are admitted and fail to register in the quarter for which they first apply may request reconsideration of their application for a later quarter within the same academic year. Application for admission for the subsequent academic year may be made by submitting a statement of activities and official transcripts of any academic work undertaken since the first application. In no case are application files retained for more than four consecutive academic quarters from the date of first admission. Application after this period may be made only by completing a new application and providing all necessary documents, including payment of the graduate application fee.

**Students who are denied admission must submit a new application together with requested documentation in order to be considered for admission in another academic year.**

## **Medical History Forms**

All new students, graduate or undergraduate, and all students returning to the San Diego campus after an absence of three or more successive quarters, must submit a completed medical history form to the Student Health Service.

Entering students are required to complete a medical history form prior to registration and to send it to the Student Health Service. A report of a tuberculin test must be submitted also. In addition, students are urged to submit a physical examination form completed by their family physician, particularly if they plan to take part in intercollegiate athletics. Information sent to the Student Health Service is held confidential and is carefully reviewed to help provide individualized health care. Routine physical examinations are not provided by the Student Health Service.

Information and required forms are mailed to all new students by the Student Health Service well in advance of registration.

## Readmission

A graduate student whose status has lapsed because of an interruption in registration must petition for readmission at least eight weeks prior to the first day of the quarter in which reenrollment is intended. Students must submit supplementary transcripts of all academic course work undertaken since last enrolled at UCSD, pay a readmission fee of \$35, and complete a General Petition and a supplementary Statement of Activities. In addition, a Statement of Legal Residence is required for all students returning after an absence of two quarters or more.

**Readmission is not automatic.**

## REGISTRATION REQUIREMENTS AND PROCEDURES

All students must enroll and pay fees on or before the deadline dates established by the Office of the Registrar for each quarter. Enrollment materials are obtained at the major department. (See *Schedule of Classes* for current deadlines.)

### Full-Time Student

A full-time student is required to be registered for twelve units each quarter of each academic year until the completion of all requirements for the degree, including the filing of the thesis or dissertation.

### Part-Time Student

A part-time student is enrolled in fewer than twelve units a quarter but is admitted as a regular student. A part-time student must pay full fees unless approved by the dean of Graduate Studies to enroll in half-time status for six units or fewer. (See "Part-Time Study," page 94.)

### Schedule of Classes

Detailed information on registration and enrollment procedures is contained in the quarterly *Schedule of Classes*, available for purchase at the University Bookstore several weeks before the beginning of the quarter.

## Preferred Enrollment Request/Registration

In advance of each quarter of registration, a student must complete the Preferred Enrollment Request form included in the current *Schedule of Classes*, listing **correct course codes** for all course work, independent study, or research to be undertaken that quarter. The Preferred Enrollment Request form must be approved by the graduate adviser and filed with the Office of the Registrar.

Once the Preferred Enrollment Request is filed with the Office of the Registrar, it constitutes enrollment in courses, and each student will receive official confirmation of class enrollments on the Registration form. Only successfully completed course work appearing on the Class Confirmation will be credited toward a degree. Unofficial withdrawal from a course listed on the Class Confirmation will result in a failing grade.

## Registration Receipt

Upon payment of fees, the Cashier's Office will provide a cash register receipt and will affix a validation sticker to the back of the Student Photo-Identification Card.

## Student Photo-Identification Card

A validated Student Photo-Identification Card is the official ID for registered students and entitles the student to library privileges, a student health card, and use of other university facilities, as well as for purchasing tickets and/or admission to certain university events and voting in student body elections.

If the Student Photo-Identification Card is lost, students may obtain a duplicate at the Campus Card Services Office, Quonset 324, Matthews Administrative and Academic Complex; if the Registration Receipt is lost, a duplicate may be obtained from the Cashier's Office (see "Fees," page 84).

The validation sticker is removed from the Student Photo-Identification Card when students withdraw or go on leave of absence.

UCSD graduate students on campus continuing their graduate studies or research during the summer months may request a Summer Validation Sticker from their major department, group, or school offices.

## Registration Procedures

A student is not officially registered for classes **until the entire registration procedure outlined below has been completed. Each quarter a graduate student must:**

1. Complete the Preferred Enrollment Request form contained in the current *Schedule of Classes* (available from the University Bookstore), obtain the graduate adviser's signature, and file it with the Office of the Registrar prior to the posted deadline for enrollment. Preferred Enrollment Request forms filed with the registrar after the deadline date (the end of the second week of instruction) will require a \$50 late fee.
2. Obtain a Registration form from the major department, take the Fee Statement portion of the form to the Cashier's Office, and pay fees for the current quarter before the deadline date (prior to 3:00 p.m. the fourth day of classes). Registration fees paid after the fourth day of instruction will require a \$50 late fee in addition to the normal registration fees.

### Note to Fellowship, Scholarship, or Traineeship Holders:

*Entering Graduate Students (first quarter enrollees only)*, whose awards pay full fees or tuition and fees, must obtain a Verification of Class Enrollment computer printout slip from the Office of the Registrar after the Preferred Enrollment Request form is filed; present this proof of full-time enrollment at the Office of Graduate Studies and Research, 409 Matthews Administrative and Academic Complex, and obtain a Fee Payment Authorization form for payment of required fees or tuition and fees.

*Continuing and Returning Graduate Students* whose awards pay full fees or tuition and fees will receive a duplicate Registration form marked "hold" which indicates that the Office of Graduate Studies and Research will forward payment of required fees or tuition and fees to the Cashier's Office. The current quarter validation sticker (to be affixed to the photo-ID card) will be available at OGSR.



*Entering, Continuing, and Returning Graduate Students* with partial fee or tuition awards must pick up a Fee Payment Authorization form at the Office of Graduate Studies and Research, 409 Matthews Administrative and Academic Complex, and present this form at the Cashier's Office with payment of the balance necessary to pay required fees in full.

(Fellowship, traineeship, scholarship holders please note that the Office of Graduate Studies and Research will not pay the late fee penalties.

**The Cashier's Office will not accept payment if you owe a library fine, past-due housing bills, etc.** It is important to clear these items so that payment may be made at the Cashier's Office before 3:00 p.m. on the fourth day of instruction.)

**Note to Teaching and Research Assistants:**

TA's, LA's, RA's, and associates may pay resident fees but not nonresident tuition by payroll deduction, so long as (1) their appointment extends through the end of a quarter, (2) their appointment is at a fixed percentage, (3) their salary is at least equal to the fee amount, and (4) their fees are not paid by the RA Tuition/Fee Remission Program.

Eligible students should bring a copy of their signed employment form and completed application papers for this program to the Office of Graduate Studies and Research well in advance of fee payment deadlines.

3. Proceed as indicated to obtain validation of registration as follows:

*New Students* who do not have a photo-ID card at the time they pay fees should go to the Campus Card Services Office, Quonset 324, Matthews Administrative and Academic Complex, and a card will be produced. The card may be picked up at the Cashier's Office where the validation sticker will be affixed.

*Continuing Students* paying fees in person should present their photo-ID card at the time of payment and the cashier will affix the validation sticker for the current quarter to the back of the photo-ID card.



4. Make all necessary changes (additions and deletions) to the Class Confirmation Card, using add/drop cards, before the end of the second week of the quarter to avoid penalties. **(Full-time graduate study requires enrollment in a minimum of twelve units each quarter.)**
5. Return the Student Information Card to Office of the Registrar *only* if corrections are necessary in the printed information.

### Continuous Registration

All graduate students are required to be registered each quarter until all degree requirements have been completed (including filing of the thesis or dissertation, and the final examination) or to be on an approved leave of absence.

A student who fails to register or to file an approved leave of absence form by the registrar's deadline date (no later than the end of the second week each quarter) will be assumed to be withdrawn from UCSD and will be dropped from the official register of graduate students. In addition, all outstanding Incomplete grades and NR's (assigned by the registrar) will lapse to F's or U's unless cleared by the end of the following quarter, or a valid extension has been granted. A student who is on leave of absence or who has withdrawn from the university is not entitled to withdraw books from the library or to use other university facilities or faculty time. A student must petition for readmission to resume study at a later date, pay the

nonrefundable readmission fee, and be considered for readmission with all others requesting admission to that quarter.

Ph.D. degree candidacy will lapse for graduate students subject to normative time policies who fail to register and are not granted a formal leave of absence. To be reinstated to candidacy, a graduate student must be readmitted, enroll and register, be readvanced to candidacy, and pay the candidacy fee. An additional quarter of registration after reinstatement to candidacy is required before the Ph.D. may be conferred.

### Late Registration

Students will be assessed late fees if not enrolled and registered by the registrar's published deadline dates each quarter.

A \$50 late registration fee will be assessed if the student has not completed registration (paid fees) **prior to 3:00 p.m. on the fourth day of instruction as outlined in the Academic Calendar and the Schedule of Classes.**

Additionally, a \$50 late enrollment fee will be assessed students who do not enroll in classes prior to the end of the second week of instruction.

A student who has not completed registration (enrolled and paid fees) by the registrar's deadline date **must petition for permission to register late and will pay late fees totalling \$100.**

## Changes in Course Selection

Drop/Add Cards reflecting changes in class enrollment must be filed with the Office of the Registrar in order for the student to receive credit for added courses and be relieved of responsibility for dropped courses.

Drop/Add Cards must be completed in full and include correct course information and course codes as listed in the current *Schedule of Classes*. When changing units in a variable-unit course, a student must drop the course first, then add it with the correct number of units.

After the Preferred Enrollment Request has been filed with the registrar, a student may add courses, change sections of a given course, or change grading options up to the end of the second week of instruction without fee by completing a Drop/Add Card available at the Office of the Registrar. Students must obtain approval of their graduate adviser (or department). See *Schedule of Classes*, "Changes of Programs."

A student may drop a class up to the end of the ninth week of classes by filing a Drop/Add Card with the registrar, after first notifying the instructor, and obtaining the approval of the graduate adviser (or department) and the dean of Graduate Studies. A processing fee is assessed after the second week of instruction (see

"Fees," page 84). If the course is dropped before the end of the fourth week of classes, no course entry will appear on the student's transcript. Courses dropped after the end of the fourth week of instruction and before the end of the ninth week of instruction will remain on the transcript as permanent entries showing course number and title, and the registrar will assign a final grade of W, signifying Withdrawal.

Students may not drop courses after the end of the ninth week of instruction and will receive the earned grade or an Incomplete, if applicable. When a grade in a course has been assigned in accordance with the Academic Senate policy on Integrity of Scholarship, a student may not subsequently change that grade by dropping the course or withdrawing from the university.

## Enrollment Limits

**A full-time graduate student in a regular quarter is expected to enroll in a minimum of twelve units of upper-division or graduate course work** with the exception that, in the Graduate School of International Relations and Pacific Studies, the normal course load is sixteen units. A student who wishes to take units in excess of these limits must obtain the approval of the graduate adviser or department chairperson.

Graduate students holding half-time appointments as research assistants, teaching assistants, language assistants, readers, or other employment titles, or who receive support from traineeships, fellowships, or scholarships paid through the university or directly to the student must enroll and register for twelve units of upper-division and/or graduate course work and research each quarter.

Teaching units (500 series) above the full-time program of twelve units are not considered an overload.

Graduate students approved for half-time study are limited to a maximum of six units of upper-division or graduate course work each quarter.

## Changes of Name or Address

Students must file official change of name or address forms with the Office of the Registrar when applicable.

## Leave of Absence/Extension

A student who discontinues graduate study with the intention of resuming during a later quarter files a formal Leave of Absence, Extension and/or Withdrawal form prior to leaving the campus. Graduate students must have completed at least one quarter of academic residence and be in good standing (GPA 3.0 minimum) to be granted a leave. All graduate students are limited to a maximum of three quarters of leave and/or withdrawal.

Prior to the end of the second week of instruction of the quarter in which the leave is to begin, a student must complete a Leave of Absence form and obtain required signatures as listed under the clearance section of the form, and the approvals of the graduate adviser, chairperson of the (major) department, group or school, and dean of Graduate Studies. If a student has registered (paid fees and enrolled) for the quarter in which a leave is being requested, the validation sticker will be removed from the Photo-Identification Card. Graduate students may request an extension of an approved leave prior to the expiration of the leave, up to the maximum of three quarters in all degree programs.

A student who has a long-term loan is considered to be out of school while on a leave of absence and **must set up an exit interview with the Loan Records Office before leaving the campus.**



Since rules and regulations pertaining to such loans are complex, it is to the student's advantage to determine loan requirements prior to seeking a leave of absence.

A student on leave of absence may not (1) be employed by UCSD, UCSD Medical Center or UC Extension, or hold a fellowship, traineeship, or similar appointment administered by the university, (2) use university facilities, (3) complete a qualifying examination for advancement to candidacy, or (4) place demands on faculty including discussion of thesis or dissertation work (either directly or by correspondence), during the period of leave.

A student may remain in student housing for one additional quarter providing he or she has been a full-time student (twelve units or more) for three consecutive quarters immediately prior to the leave of absence.

Students must return all borrowed library material if requesting a leave of absence or withdrawing.

A new Statement of Legal Residence is required for all graduate students **returning from a leave of absence of two quarters or more**. In addition, a student who has been on leave of absence for three or more consecutive quarters must be cleared by the Student Health Service prior to reenrolling at UCSD.

## Withdrawal

A student withdrawing from the university must obtain a Leave of Absence, Extension and/or Withdrawal form and secure appropriate signatures. The approved form must be filed with the Office of Graduate Studies and Research and the validation sticker removed from the Photo-Identification Card.

Students who withdraw during the first thirty-five days of instruction will receive refunds of fees in proportion to the number of *elapsed calendar days since the first day of instruction*. The date of withdrawal used in calculating the refund shall be on the date on which the approved



notice of withdrawal is submitted to the Office of the Registrar.

A registered student who stops attending classes and fails to file a Leave of Absence, Extension, and/or Withdrawal form will receive a grade of F or U in each course, thus jeopardizing eligibility for readmission.

## Bar from Registration/Nonacademic

After suitable warning, a student may be barred from further registration for a variety of nonacademic reasons, including failure to comply with official notices, to settle financial obligations when due, to complete medical examination requirements, or other related matters.

## Bar from Registration/Academic

Academic disqualification is determined by the dean of Graduate Studies on recommendation of the chairperson of the student's department, and normally relates to unsatisfactory academic performance, e.g., failure to maintain a grade-point average of 3.0 or better; failure to meet departmental criteria of performance; accumulation of more than eight units of F or U grades; or failure to comply with conditions set at the time of admission to a graduate degree program.

## APPENDIX

### National Examination Information

There are a variety of nationally administered examinations which may be taken to meet requirements for admission to graduate study or to satisfy certain requirements for advanced degrees. Several examinations of importance to UCSD students are listed here.

#### Graduate Record Examinations (GRE)

**Address:** Graduate Record Examinations, CN 6000, Princeton, New Jersey 08541-6000.

**Purpose:** To appraise intellectual qualification of candidates for admission to graduate study and to help sponsors of fellowship programs select the recipients of their awards.

**Application:** Information and forms are available at the Office of the Registrar, UCSD, or the above address. In order to meet established deadlines, students applying for admission for fall quarter should make every effort to take the October examination in the year preceding their expected date of entry to a graduate program.

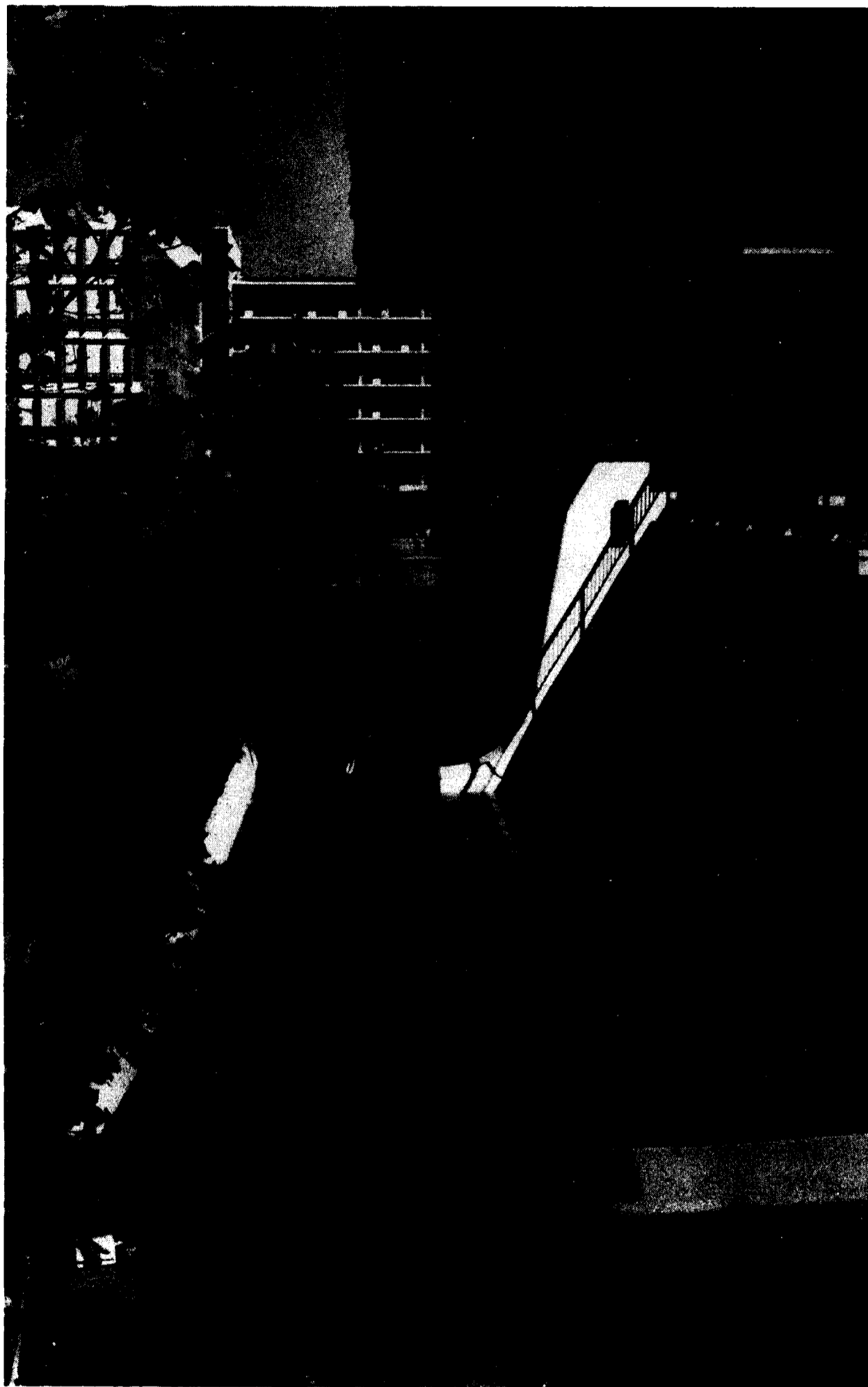
GRE test-takers in California and New York may purchase a ticket for any regularly scheduled test through Ticketron up to the day before the test date or by mailing a completed registration form to Educational Testing Service by the registration closing date.

All other test-takers must submit applications to Educational Testing Service (see above for address) at least *five weeks* prior to scheduled examination dates in the United States and Puerto Rico and at least *six weeks* in all other countries. In an emergency, it may be possible to take the GRE without registering beforehand.

**Examination Schedule:** Five times a year in the U.S. and in 133 countries; several special administrations of the tests are given each year in some major U.S. cities (dates change).

|   |       |
|---|-------|
| <b>Fee:</b> General (Aptitude)                  | \$29* |
| One Subject (Advanced)                          | \$29* |
| Test Center outside the U.S.<br>and Puerto Rico | \$39* |

\*Subject to change



## Graduate School Foreign Language Testing Program (GSFLT)

**Address:** Educational Testing Service, Box 519, Princeton, New Jersey 08541.

**Purpose:** To measure ability to read and understand literature written in French, German, Russian, or Spanish in order to meet foreign language requirements for advanced degrees.

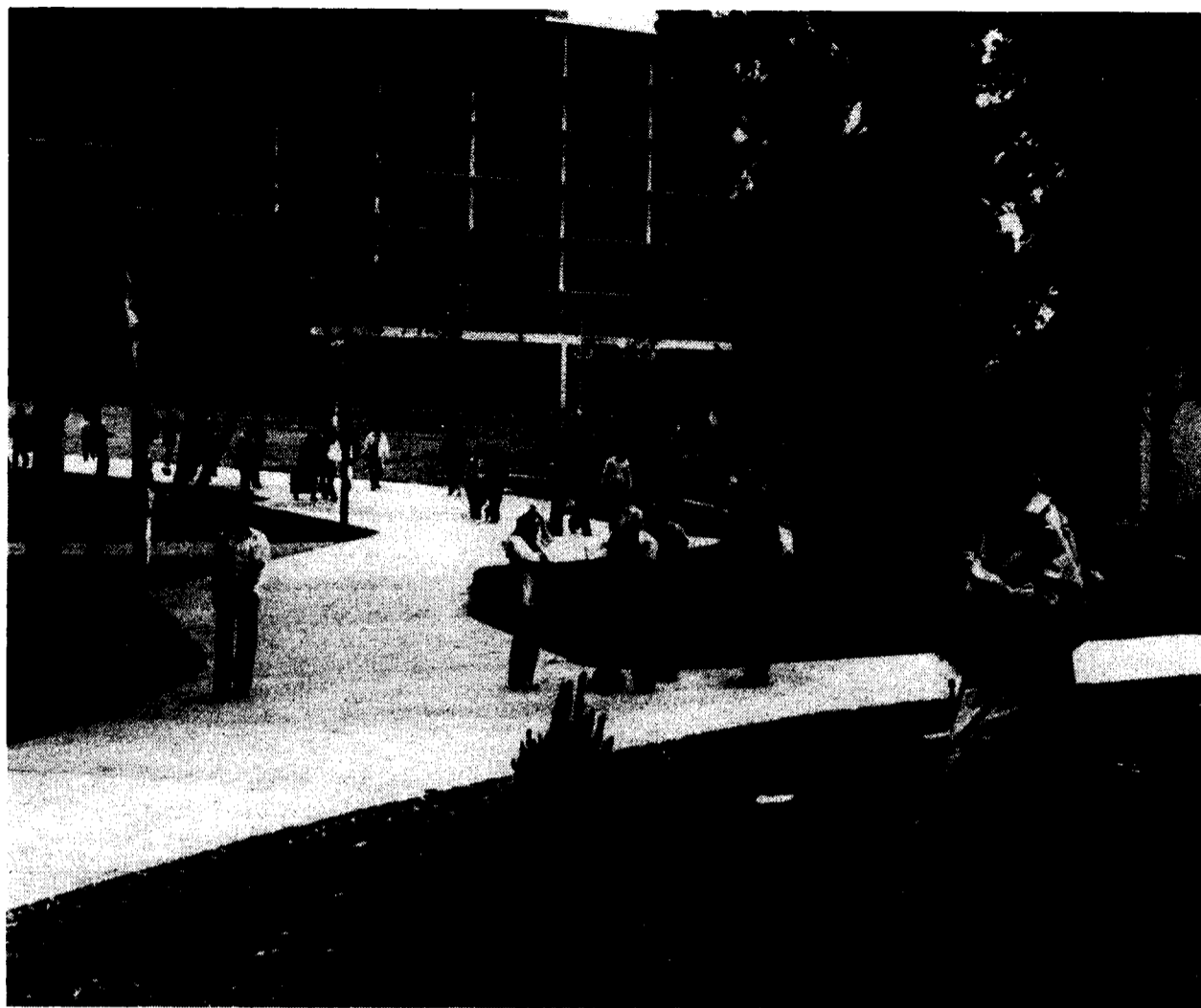
**Application:** Information and forms are available from San Diego State University Testing Office, 560 Library East, 5300 Campanile Drive, San Diego, California 92182-0577. Telephone: (619) 265-5216.

Tickets are available the first of the month prior to the month in which the examination is given. Students should arrange to pick up a ticket of admission at the testing office a few days before the scheduled examination. It is impossible to do this the same morning as the test.

**Examination Schedule:** Four times a year (dates change each year).

**Fee:** \$5\*

\*Subject to change.



## Test of English as a Foreign Language (TOEFL)

**Address:** TOEFL Services, CN 6151, Princeton, New Jersey 08541-6151.

**Purpose:** To help foreign students demonstrate their English language proficiency at the advanced level required for graduate study.

**Application:** Information and forms are available from the above address; United States embassies, consulates, and related centers; and the San Diego State University Testing Office, 560 Library East, 5300 Campanile Drive, San Diego, California 92182-0577. Telephone: (619) 265-5216.

Applications must be submitted to TOEFL Services at least six weeks prior to the scheduled examination date.

**Examination Schedule:** One day each month (dates change each year) in approximately 135 countries.

**Fee:** \$24\*, if scheduled Saturday  
\$32\*, if scheduled Friday

\*Subject to change.

## Test of Spoken English (TSE)

**Address:** Educational Testing Service, Box 6157, Princeton, New Jersey 08541-6157.

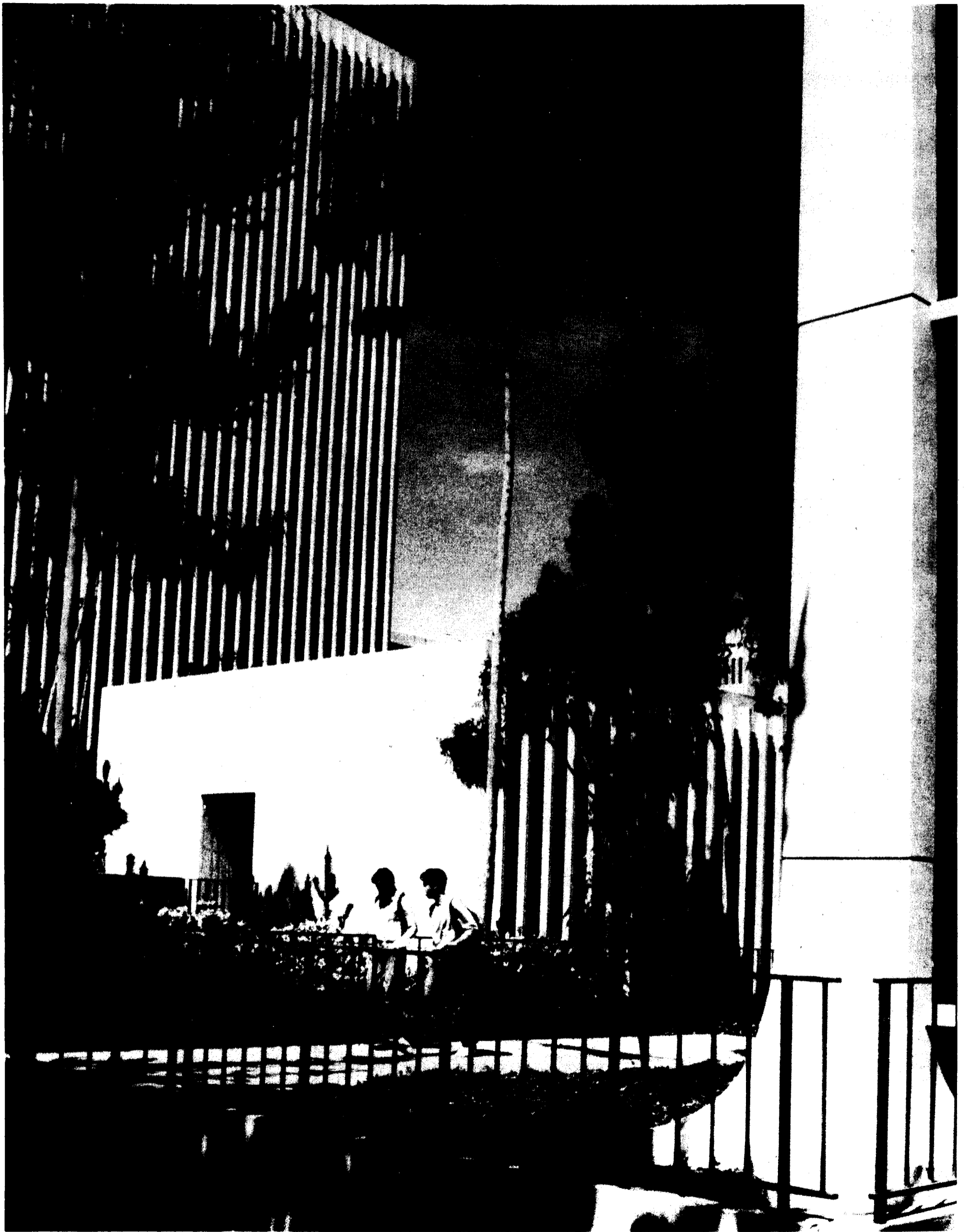
**Purpose:** To help foreign students provide a reliable measure of proficiency in spoken English. This test is highly recommended for foreign applicants for teaching assistantships.

**Application:** Same as TOEFL above.

**Examination Schedule:** Nine times a year (dates change each year) in approximately 135 countries.

**Fee:** \$45\*

\*Subject to change.





# CAMPUS SERVICES AND FACILITIES

## ACADEMIC SERVICES AND PROGRAMS

### Academic Computing Center

Applied Physics and Mathematics Building, first floor  
Mail code C-010  
534-4050

The Academic Computing Center provides a wide range of computer services to support instruction, research, and administration.

### Instruction and Research

Instruction and research computing is done on VAX and Pyramid systems using either VMS or UNIX operating systems. With these systems, students and researchers have access to the computer languages BASIC, FORTRAN, and PASCAL. Statistical packages and mathematical routines include BMDP, IMSL, MINITAB, and SPSS. Computer graphic facilities include four-color hardcopy plotting and storage display video technology which use DISSPLA, TEKTRONIX, and ZETA software packages. Basic text formatting programs are available for term papers and the like. More advanced text-processing facilities for thesis production, journal articles, and book manuscripts are provided by the Computer Assisted Typing and Typesetting (CATT) service which runs on dedicated computers using UNIX.

Most users access the computer systems by using interactive terminals which are located in public areas, classrooms, laboratories, libraries, and private offices around campus. Printers in the colleges are joined in a network so that users of the computer systems can direct their hardcopy output to a nearby location. Dial-in telephone lines are available for off-campus use or for data transfers from personal computers.

### Terminal Locations

Terminals are available on each campus for use by students, faculty, and staff. Students have first priority. These terminals are connected to the LAN for access to all computer systems.

| Location            | Number of Terminals |            |
|---------------------|---------------------|------------|
|                     | (screen)            | (hardcopy) |
| Revelle College     |                     |            |
| rm. 1240 H-UGL      | 21                  | 1          |
| rm. 1260 H-UGL      | 42                  | 2          |
| Playback Ctr. H-UGL | 7                   | 0          |
| Muir College        |                     |            |
| User Area, AP&M     | 17                  | 0          |
| rm. 5839 AP&M       | 9                   | 0          |
| rm. 1882 AP&M       | 15                  | 0          |
| rm. 2313 AP&M       | 34                  | 0          |
| rm. 6438 AP&M       | 32                  | 0          |
| rm. 3125 (a,b,c) PL | 7                   | 1          |
| rm. 2101 AP&M       | 14                  | 0          |
| Third College       |                     |            |
| 105 THL             | 27                  | 0          |
| Warren College      |                     |            |
| Bldg. Q-324         | 6                   | 0          |
| Central Library     |                     |            |
| 4th floor           | 1                   | 0          |
| 5th floor           | 0                   | 1          |
| School of Medicine  |                     |            |
| rm. B245 BSB        | 4                   | 1          |

### General Information

Each system has an on-line documentation system which gives easy, keyed access to descriptions of the programs and facilities available on that system. Manuals for commercially written software packages are available at the University Bookstore. In addition, professionally staffed consulting offices are available to support the use of computer languages, software packages, and word processing. The consulting service is aimed at making users self-sufficient, and avoids becoming involved in projects. Short, noncredit classes are offered to acquaint the students, faculty, and staff with the various facilities, programs, and services which are available to the campus community.

The computer systems are run by a staff of professional operators on a twenty-four hour-a-day, seven-day-a week schedule as a closed shop.

From time to time the Computing Center hires students as part-time operators, technicians, coders, and consulting aides.

These jobs are posted in the Student Employment Office.

### Education Abroad Program (EAP)

International Center (corner of Hutchison Way and Gilman Drive)  
Mail code Q-018  
534-1123

The Education Abroad Program provides students enrolled at the University of California an opportunity for an intercultural experience at UC centers located in Australia, Africa, Asia, Europe, and Latin America while allowing normal progress toward a degree.

The program is described in detail in the "Courses, Curricula, and Programs of Instruction" section of this catalog under the "Education Abroad" heading.

Students interested in studying abroad should also see the entry on the Opportunities Abroad Office, below.

### Education at Home Program (EHP)

The Education at Home Program, coordinated by the Riverside campus, provides a unique educational opportunity for UCSD students who have a special interest in early American history and culture. Successful applicants spend nine weeks in Williamsburg, Va., one in Philadelphia, and a concluding week in Washington, D.C. The EHP is open to all UCSD undergraduates. Graduate students may apply with prior approval of their graduate adviser. Registration (as an "Intercampus Visitor" to the Riverside campus) will be made for three upper-division history courses listed in the Riverside catalog as History 157, 158, and 159. The EHP is normally available winter quarter each year. For further information and application forms, contact your college academic advising office. For more information call the Riverside campus at (714) 787-3820.

### **Foreign Scholar Adviser**

International Center (corner of Hutchison Way and Gilman Drive)  
Mail code Q-018  
534-3730

The foreign scholar adviser is responsible for the proper documentation of all nonimmigrant postdoctoral fellows, researchers, and faculty. All new researchers and faculty who are citizens of countries other than the United States must bring their passports to the International Center as soon as possible after their arrival on campus, so that their visa status may be verified. Departments are required to advise the International Center of both the arrival and departure of visiting foreign faculty members. In addition to maintaining this documentation, the foreign scholar adviser and the Friends of the International Center provide hospitality programs, counseling, and other services to members of the foreign community.

### **Foreign Student Adviser**

International Center (corner of Hutchison Way and Gilman Drive)  
Mail code Q-018  
534-3730

The foreign student adviser provides assistance to UCSD's nonimmigrant foreign students, including advising on immigration, financial, health, and personal matters. The foreign student adviser also coordinates campus programs such as orientation and check in for new students, and provides support to international student organizations.

### **OASIS (Office of Academic Support and Instructional Services)**

OASIS Main Office,  
1058 Humanities/Undergraduate  
Library Bldg.  
Mail code B-036  
534-3760

The Office of Academic Support and Instructional Services (OASIS) provides a variety of services to maximize student performance and retention at the University of California, San Diego.

### **Goals**

OASIS provides activities that support and contribute to the improvement of teaching and learning. Programs range from services to help students overcome past academic deficiencies to programs to help them excel in a subject matter or skill. Services are provided also to faculty interested in improving aspects of their teaching, and to faculty and staff interested in assistance with evaluation or research projects.

### **Eligibility for Services**

All students in any of the four colleges are eligible for OASIS programs. Classes are noncredit and may be repeated. Course titles and schedules are printed in the *Schedule of Classes* and campus media. Student services are available in six locations: the Underground, the Second Story, the Third Place, the Warren Academic Services Center, Muir Dorms, and the OASIS Main Office.

### **The Academic Success Program (ASP)**

ASP coordinates services to all Educational Opportunity Program/ Student Affirmative Action (EOP/SAA) freshman students and provides professional and peer counseling including in-depth interviews, analysis of academic background, and goal setting which lead to an individualized program for each student.

In addition, ASP coordinates a four-week residential Summer Bridge Program for entering EOP/SAA freshmen. Students attend classes in mathematics, science, writing, and reading. A variety of cultural and personal development sessions are coordinated with these academic programs to orient students to college and provide a smooth transition from high school to UCSD.

OASIS Main Office, extension 43760  
Humanities/Undergraduate Library  
Bldg. 1058

### **The B.C. (Before Calculus) Program**

The OASIS B.C. Program is designed to support students in their desire to excel in the precalculus sequence and to build a strong foundation for the calculus sequence. As a program participant, the student will be working and studying regularly with other students. The program offers pre-calculus workshops for Community College Math. 140 and Math. 4C as well as workshops in UCSD's Math. 1A-C.

OASIS Main Office, extension 43760  
Humanities/Undergraduate Library  
Bldg. 1058

### **Reading and Study Skills Program**

The Reading and Study Skills Program offers mini-courses, study skills workshops, and one-to-one conferences. The center offers GRE, MCAT, and LSAT Preparation Courses which provide test-taking practice and strategies. One-time Study Skills Workshops are also scheduled throughout the quarter on such topics as time management, textbook reading, concentration, memory, and test preparation. Finally, students may enhance all of their skills through PAL (Personal Assistance for Learning) conferences with a learning specialist. PAL conferences focus on the learning tasks, texts, and issues related to the student's specific course work. All of the workshop topics plus goal setting, procrastination, and stress management can be handled in these sessions.

Humanities/Undergraduate Library  
Bldg. 1058,  
extension 43760

### **Research and Evaluation Program**

Administered jointly by the Office of the Assistant Vice Chancellor for Academic Services and OASIS, the Research and Evaluation program operates the OASIS Data Base.

Research projects examine a particular problem or issue related to OASIS services and have included studies of the relationship between high school quality and UCSD academic performance, the enrollment of women and minority students in majors requiring mathematics, the relationship between spatial and verbal aptitudes and self-instructional materials, and the effect of self-control techniques on test performance in calculus and chemistry. In addition, longitudinal studies of the effect of services on student users are undertaken, such as follow-up studies on the retention of Academic Success Program and Summer Bridge students.

Evaluation activities that are essential to the provision of effective services to students are also the responsibility of this program. All OASIS programs are evaluated each quarter, and results are used to make improvements in service for the

following quarter as well as for long-range planning. Evaluation projects include study of the characteristics of students served, type of service provided, student opinion of services, and outcomes of service.

Research and evaluation reports are printed, bound, and distributed to interested persons or groups. These reports also provide much of the information necessary for various funding sources.

### **TEP 196 — The Psychology of Teaching**

The director of OASIS teaches a four-unit, upper-division course that provides instruction to all OASIS student staff members — tutors, peer counselors, and study skills counselors — on the teaching-learning process. The course is designed to balance lectures and readings with supervised, practical experience.

*OASIS Main Office, extension 43760  
Humanities/Undergraduate Library  
Bldg. 1058*

### **OASIS Satellite Offices**

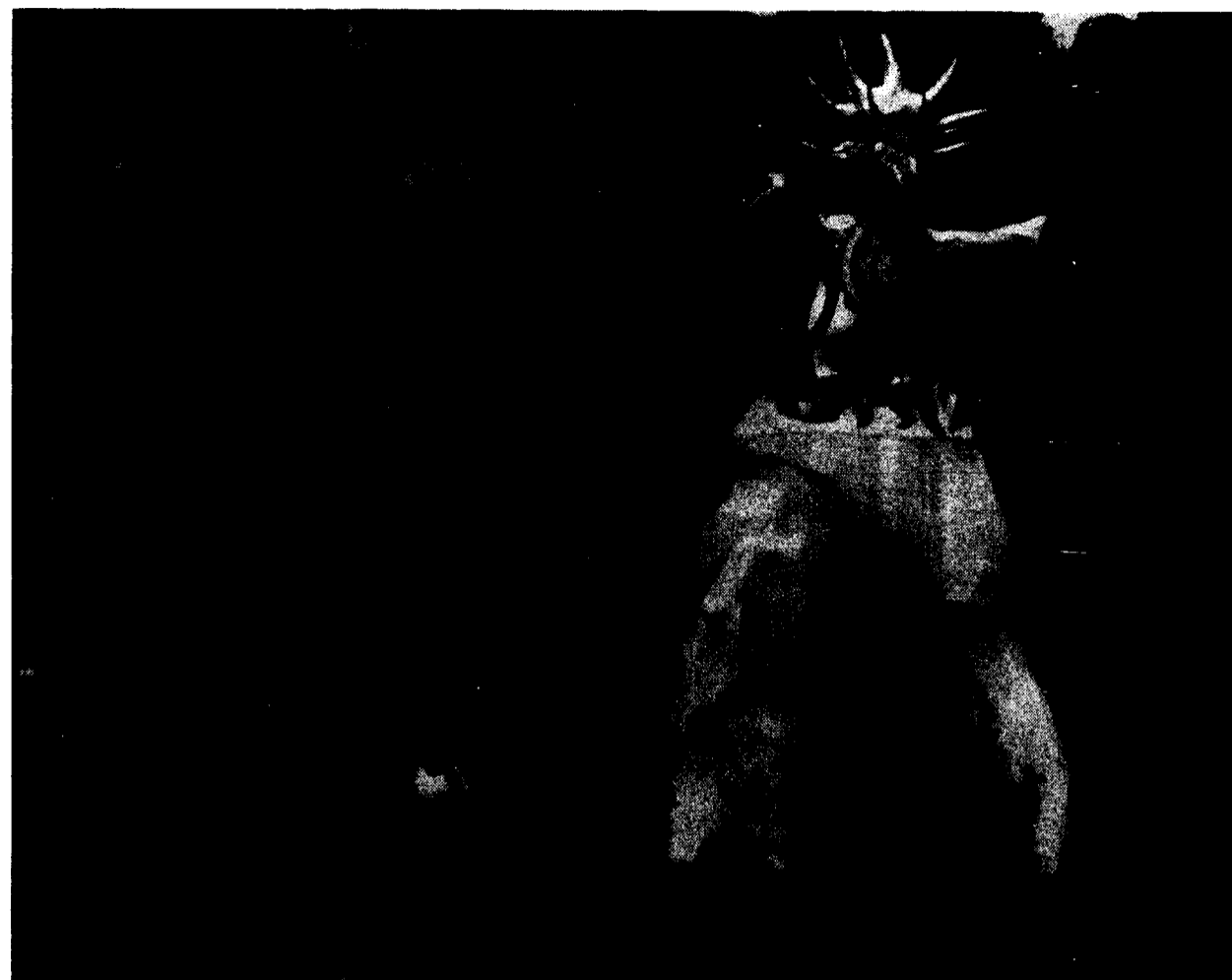
The Third Place provides services to all Third College and EOP/SAA students. Professional and peer counselors assist in all areas with adjustment to university life. In addition, there are tutors in writing, study skills, lower-division math., physics, chemistry, economics, biology, and computer science.

The Warren Academic Services Center, operated jointly with Warren College academic advising, offers tutoring and peer counseling, as well as selected workshops and study groups.

*The Third Place, extension 43284  
102 Third College Commons  
Warren Academic Services Center,  
extension 46030  
Warren College Apartments Bldg. 2,  
Apt. 2110*

### **Tutorial Programs**

OASIS provides free tutoring in lower-division biology, chemistry, physics, mathematics, economics, and computer science. Tutors are available on a drop-in basis to help the student become an independent learner. Most of the tutorial services are located in the Underground but are also available at the Third Place, the Warren Academic Services Center, and Muir Dorms. Tutors often arrange to hold group sessions in various locations throughout the campus. All tutors are required to complete TEP 196, The Psy-



chology of Teaching, concurrent with their first quarter as tutors.

*The Underground, extension 42280  
1254 Humanities/Undergraduate  
Library Bldg.*

### **Writing Center**

At the Writing Center students improve their writing skills and strategies for a range of different writing situations — the essay-exam, the lab report, term and research papers — and across disciplines, from science to literature. One-to-one writing conferences are available by appointment for all UCSD students. These conferences stress prewriting preparation, revision, and editing strategies. Small group sessions address special needs, for example, research writing, editing, and writing English as a second language. The Grammar Moses telephone hotline offers phone-in service for help with diction, grammar, mechanics, and spelling.

*OASIS Second Story, extension 42284  
Undergraduate Sciences Bldg.,  
Room 4070*

### **The Language Program**

Students whose first language is not English are helped in the Language Program (LP). In addition, students doing academic, class related work in Spanish, French, Italian, and other foreign languages can participate in LP Workshops conducted by bilingual staff. The OASIS

Language Program services include the Language Program Class, a biweekly intensive reading and writing class; weekly fifty-minute workshops on grammar and mechanics; weekly fifty-minute workshops in Spanish, French and other languages; practice of the English language for foreign students; and individual conferences where feedback on drafts of writing in the languages is provided.

*OASIS Second Story, extension 42284  
Undergraduate Sciences Bldg.  
Room 4010*

### **The Scholar's Writing Workshop**

Students who are committed to achieving academic excellence as writers and who wish intensive, individualized help and group feedback on written assignments can participate in the Scholar's Writing Workshop. Services include weekly workshops and individual conferences.

*OASIS Second Story, extension 42284  
Undergraduate Sciences Bldg.  
Room 4070*

## Office of International Education

International Center  
(corner of Hutchison Way and Gilman Drive)  
Mail code Q-018  
534-3730

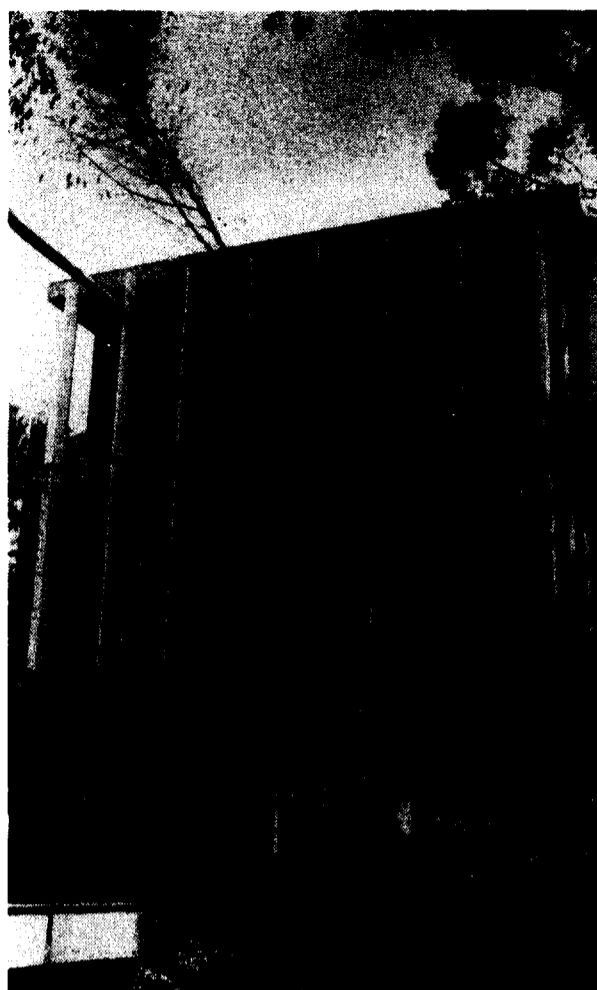
The Education Abroad Program adviser, the Foreign Student and Scholar advisers, and the Opportunities Abroad Program adviser and resource library are located in the International Center. In addition, the center has American English tutors available to foreign students, and houses the office of all the community volunteers who provide a wealth of hospitality programs to international students, scholars, and spouses.

The staff and community volunteers as well as the International Club also sponsor a variety of international/intercultural programs and services for all members of the UCSD community. These include lectures, language exchanges, linkages with international faculty specialists, and weekly international cafes.

## Opportunities Abroad Program (OAP)

International Center (corner of Hutchison Way and Gilman Drive)  
Mail code Q-018  
534-1123

The Opportunities Abroad Program (housed in the Opportunities Abroad Office, along with the Education Abroad Program) provides UCSD students with information and advisory services enabling them to study, work, and travel abroad. Students participating in academic programs abroad sponsored by institutions other than the University of California transfer credit back to UCSD, and receive assistance with this and other preparations through the OAP. Students participating in nonacademic programs generally do not earn credit but in some instances may arrange to do so, for example, through the Academic Internship Program. When participating in non-UC academic programs abroad, students maintain their eligibility for UCSD financial aid by arranging for concurrent enrollment at UCSD through OAP.



## San Diego Supercomputer Center

SDSC Building  
Mail code D-005  
534-5000

The San Diego Supercomputer Center (SDSC), located on the campus of UCSD, is administered and operated by GA Technologies Inc. Major funding comes from the National Science Foundation and the state of California. Policy guidance is given by a consortium of twenty-six research and educational institutions, including UCSD.

### A National Facility

SDSC is a national user facility, primarily for nonproprietary work by academic, government, individual, and industrial researchers. Allocation of computing resources is made on the basis of peer reviews of competing research proposals. Each consortium institution also has a block of resources to be used for educational and research purposes.

### SDSC Resources

The hardware centerpiece of SDSC is a CRAY X-MP/48 supercomputer, which has four processors [yielding a peak speed of 840 million floating-point operations per second (Mflops)] and 8 million 64-bit words of memory. Local, fast-access disks provide temporary file storage. The interactive operating system,

CTSS (Cray Time-Sharing System), supports text editing, file management, vectorized FORTRAN compilation, and dynamic debugging.

Additional computing power is supplied by a Scientific Computer Systems SCS-40 mini-supercomputer. Its processor has a peak speed of 44 Mflops and 4 million 64-bit words of memory. It features a fully CRAY-compatible instruction set.

### Access

Consortium institutions, including UCSD, have their own Remote User Access Centers (RUACs) with associated output devices.

The RUACs are tied together in a network, SDSCnet, by high-speed (56 kbps) land or satellite lines. SDSCnet also has high-speed connections to many other networks. Direct dial-up access is also available.

### Software and Services

Languages supported include FORTRAN, CAL (Cray Assembly Language), C, Pascal, and PSL (Portable Standard LISP). Scientific programming in FORTRAN in particular is speeded by vectorizing compilers CFT and CIVIC, supported by debugging and optimization utilities.

A full range of mathematical and statistical software is available, including IMSL and SLATEC. Graphics software includes DISSPLA and MOVIE.BYU. Programs for symbolic computation, engineering analysis, and computational chemistry are also provided, along with several biochemical data bases.

System utilities include text editing, file management, job control, an interactive HELP utility, on-line documentation, electronic mail, and electronic bulletin boards. Consulting services are available by telephone during business hours. SDSC staff members give orientation classes and teach workshops in programming techniques and selected applications.

The SDSC computers are available twenty-four hours a day, seven days a week.

## UCSD Extension

9600 North Torrey Pines Road  
(on the UCSD campus north of  
Muir College)  
Mail code X-001  
534-3400

Extension is an academic activity of the University of California, through which UCSD serves the education needs and lifelong learning interests of adults in the San Diego community. Extension provides advanced learning opportunities for educated and professional people, including courses, seminars, workshops, institutes, conferences, and study tours. Annual enrollment is approximately 35,000. With the exception of specific grant-funded programs, Extension is supported by course fees and receives no state funds.

Extension courses numbered 1 through 199 are structured in accordance with the requirements for regular campus courses and may be taken by UCSD students for elective credit.

For further information on Extension, phone 534-3400 for a free *Explore* catalog. Among the many programs that compose the Extension curriculum are:

### Continuing Professional Education

Courses and certificate programs are offered in a wide range of fields including microcomputer engineering, management, accounting, marketing communications, systems programming, personnel, real estate, emergency department nursing, fund raising, alcohol studies, and fitness instruction. State-approved credential programs for educators, quarterly engineering colloquia, a career planning program, and annual writers' conferences which bring together potential authors and noted publishers and editors are also part of the curriculum.

### Executive Programs

Extension offers a variety of programs to meet the needs of San Diego companies for astute, broadly educated managers equipped to deal with the dramatic financial, technological, and cultural changes in today's workplace.

Two such programs include the "Executive Program for Scientists and Engineers" and the "Leadership and Management Program for Scientists and Engineers." Both are accelerated,

proficiency-based courses of study tailored to the scientist or engineer who holds, or is about to be promoted to, a significant management position. Participants are nominated to apply for the programs by their companies. Both programs were developed by an advisory committee of San Diego engineering executives.

In addition, Extension sponsors major institutes and conferences featuring international experts designed to meet the needs of a national as well as local business constituency. "Internal Venturing" and "Securities Regulation" are two subjects recently covered.

### ExtenNET

This service, available by subscription from Extension, broadcasts regular UCSD undergraduate and graduate courses directly to San Diego companies via an interactive television system.

### Advanced Training for Educators

State-approved credential programs for teachers offered by Extension include adult education, community college instruction, and learning handicapped, to name just a few. There are two certificate programs in computers in education, plus a wide range of seminars and workshops in innovative teaching techniques and educational administration.

In addition, summer institutes for teachers allow the university to contribute to the education of our community's young people by enhancing the intellectual perspective of teachers. For example, Science and Mathematics Teacher Institutes funded by NSF and local foundations bring selected teachers to the campus for seminars and courses taught by prominent UCSD faculty.

### CONNECT: The Program in Technology and Entrepreneurship

Formed in the fall of 1985, the Program in Technology and Entrepreneurship is designed to contribute to the realization of San Diego's high-technology potential. The program provides a context in which the leaders of high-tech businesses and service industries can exchange information, generate ideas, and develop resources. Among its many activities — including research, publications, forums that bring together the financial and technological communities, and contributions to the future expansion of high technology in San Diego — the program presents

educational events designed to fulfill such objectives as: helping researchers and entrepreneurs identify the commercial potential of their ideas and findings; creating opportunities for researchers to showcase their ideas to potential investors and venture capitalists; helping entrepreneurs improve their business planning, management, and financial skills; and creating a context for analysis and discussion of the critical public policy issues that affect the growth of high-tech enterprises. For further information, phone the program director, 534-0707.

### Lifelong Learning Opportunities

People who enjoy reading, thinking and talking about ideas, exploring the philosophies of other cultures and other times, or exercising their creative talents have an unusual resource in Extension. People interested in keeping current on changing trends and public issues can also turn to Extension for in-depth analyses and discourse. Courses and workshops are offered in painting, music, acting, literature, history, oceanography, political science, health, foreign languages, to name just a few. In addition, a variety of public service programs are offered such as the annual free public lectures on "Issues in the Humanities," funded by the National Endowment for the Humanities, featuring distinguished scholars.

### English Language Program

Extension offers a variety of English programs for individuals for whom English is not the native language. The Intensive English Language Program is taught at six academic levels with electives such as advanced grammar, TOEFL preparation, American history, and business and scientific English. It is offered throughout the year at ten-week intervals. In addition, short courses in conversation are offered during the winter and summer (and at other times by special contract) for international visitors and students who wish to improve their ability to understand and communicate in English.

In addition, an innovative series of courses in English for Bilingual Professionals, leading to a certificate, offers bilingual managers, business owners, and professionals a means to advancement in our English-oriented society.



**Health Management**

In the 1980s, health has emerged as a critical issue, from the economic and sociological as well as medical perspectives. Extension offers advanced and continuing education courses for health professionals, the Professional Development Series in Health Care Management for health industry administrators, and a beginning and advanced Certificate Program in Fitness Instruction/Health Management.

In addition there is the recently formed Program on Alcohol Issues which is designed to contribute to a broader public understanding of alcohol problems and the avoidance of their adverse consequences. Program offerings include national conferences, professional development courses, the annual Summer School of Alcohol and Other Drug Studies, and court-ordered drinking driver education classes.

**Concurrent Registration**

Concurrent Registration is a procedure which allows individuals who are not officially matriculated UCSD students to participate for credit in regular UCSD courses. Enrollment is on a space-available basis with the approval of the course instructors. Individuals must register through Extension. Information on this program can be obtained through the Extension Registration Office.

A reciprocal arrangement allows matriculated UCSD students to enroll in Extension courses free of charge. Undergraduates at UCSD interested in this program should call their provost's office for information; graduate students should contact the Office of Graduate Studies and Research.

**Institute for Continued Learning**

The institute is an organization for retired persons conceived, developed, and directed by retirees themselves. ICL has an active learning and social program created by members, including seminars, study groups, classes, forums, trips, and luncheons.

**The University Library**

The UCSD library consists of the Central University Library, the Science and Engineering Library, the Biomedical Library and Medical Center Library, the Scripps Institution of Oceanography Library, the Undergraduate Library, and the Slide Collection.

**Combined UCSD  
Library Statistics, 1986**

|  |           |
|--|-----------|
| Volumes:   | 1,760,614 |
| Periodical and other serial publications received: | 32,691    |
| Government documents:                              | 346,691   |
| Manuscripts:                                       | 2,865,125 |
| Maps:  | 228,586   |
| Microforms:  | 1,303,332 |
| Phonorecords, tapes, cassettes:                    | 49,354    |
| Slides and other pictorial items:                  | 179,359   |

The library is a center for study, reading, and scholarship at UCSD. Its collections and services are basic resources supporting undergraduate and graduate instructional programs, as well as advanced research. The library units are organized and staffed to meet these academic objectives. While each library may have varying rules, all are open to all members of the UCSD community.

Reference services are available at each of the campus libraries and are designed to assist students and faculty with their course needs and research activities. Through its Instructional Services Program, the library offers campus users a variety of orientation and instructional opportunities. The Contemporary

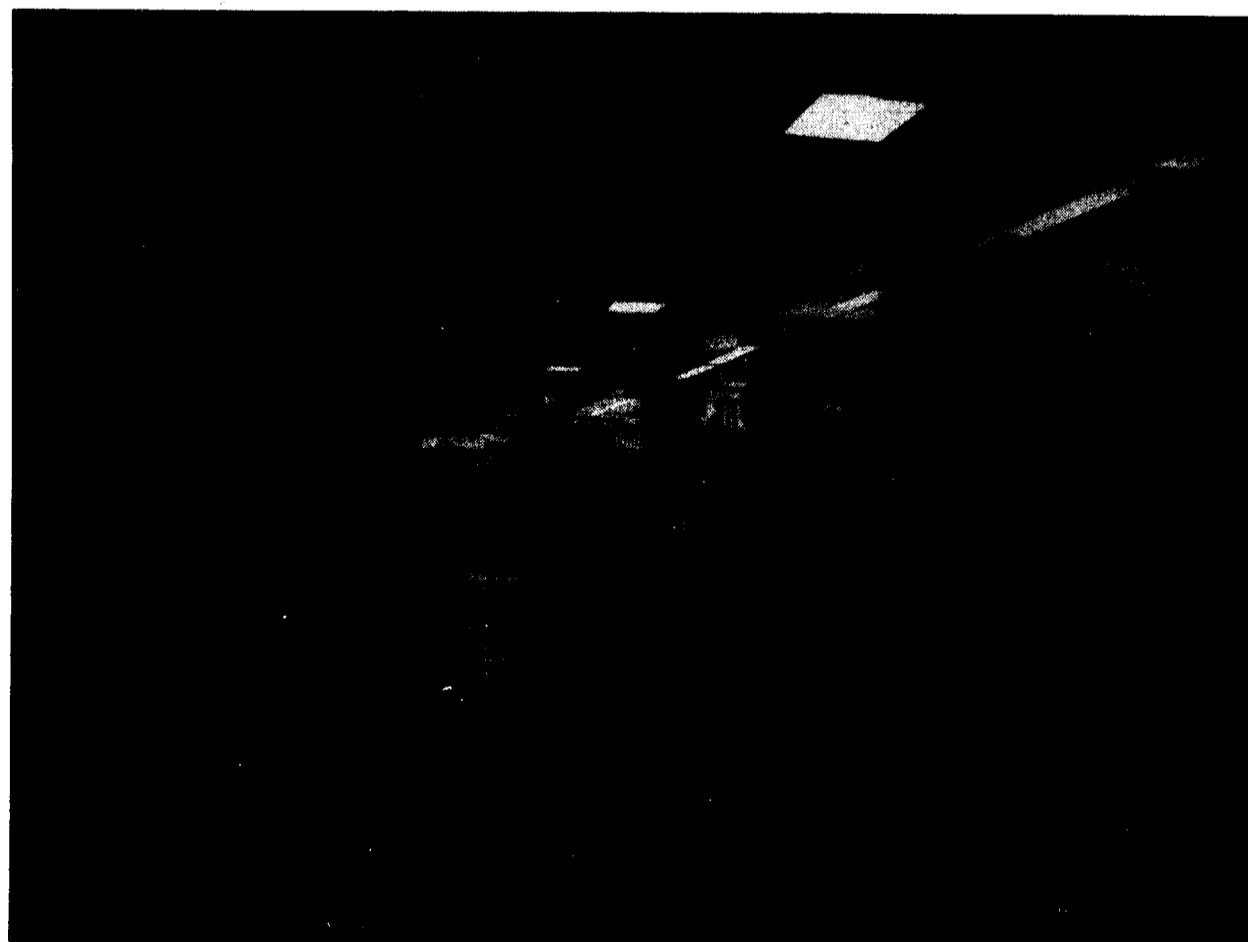
Issues 50 course (Information and Academic Libraries) of Muir College is one example. Individual and group tours of the libraries can be arranged through the reference librarians.

The Interlibrary Loan Service locates and borrows materials not held at UCSD. This service is available to all faculty, staff, and students of the university. Our students enjoy direct borrowing privileges at the other UC campuses. A small jitney bus that makes a daily round trip to the UCLA library is available to members of the UCSD community as space allows.

The Computer Assisted Reference Service assists readers in the compilation of subject bibliographies. This process not only saves readers the time of manually searching periodical abstracts and indexes, but also permits more thorough searching of data bases like Biological Abstracts, ERIC, Medline, and Psychological Abstracts. Contact the reference departments of the Central University Library or any science library for this service and the procedure for using it.

Library hours of service are regularly posted. Most units extend hours during examination periods.

NOTE: Call 534-3837 for an up-to-date schedule of open hours for all libraries (recorded message).





**Central University Library**

(located north of the Matthews Administrative and Academic Complex and east of Third College)

Mail code C-075-R  
534-3336

The Central University Library houses the research collections in the social sciences, humanities, and fine arts (1,128,384 v.). Its Reference Department contains an outstanding collection of bibliographies, indexes, encyclopedias, biographical directories, and other information resources. The Documents Department is a depository for the official publications of California, the United States, United Kingdom and the United Nations, and also contains a major topographical and political map collection and a large microform collection. A listening facility in the Music Collection serves music instruction and research. The Mandeville Department of Special Collections includes rare books, manuscripts, and other research materials. Special Collections' resources include materials about Baja California, Pacific Voyages, the Spanish Civil War, science and public policy, and modern poetry.

**Science and Engineering Library**

Urey Hall, Revelle College  
Mail code C-075-E  
534-3258

The Science and Engineering Library contains strong collections in the physical sciences and technology (146,187 v.). Of particular importance are its research materials in aeronautics, astrophysics, atomic energy, chemistry, computer science, electronics, engineering, instrumentation, mathematics, missiles research, physics, space sciences, and nuclear energy.

**Biomedical Library**

Basic Science Building, School of Medicine  
Mail code C-075-B  
534-3255

The Biomedical Library contains collections in biology and medicine which are especially rich in the journal literature of the basic sciences and clinical medicine, with emphasis on cellular and molecular biology, neurosciences, genetics, and neoplasia (174,960 v.). A branch of the Biomedical Library is located at the UCSD Medical Center in the Hillcrest area of San Diego (22,669 v.). Mail code H-828, 543-6520.

**Scripps Institution of Oceanography Library**

Mail code C-075-C  
534-4817

Scripps Institution of Oceanography Library is considered to be one of the two great oceanographic libraries in the world (196,739 v.). It has outstanding collections in marine biology, oceanography, and underseas technology, and also specializes in geology, geophysics, and zoology publications.

**Undergraduate Library**

Humanities-Undergraduate Library Building,  
Revelle College  
Mail code C-075-D  
534-3065

The Undergraduate Library has a general collection especially tailored to serve the needs of undergraduates (91,675 v.). Its Playback Center is designed for the performance of audiovisual materials that faculty are using in their classes.

**The Slide Collection**

Mandeville Center  
Mail code C-075-F  
534-4811

This collection has been developed to provide visual materials for on-campus instructional purposes. It includes 147,006 slides covering all periods of art history in architecture, sculpture, painting, and the minor arts.

**STUDENT SERVICES AND PROGRAMS****Vice Chancellor, Undergraduate Affairs**

Building 112,  
Matthews Administrative and Academic Complex  
Mail code Q-015  
534-4370

The Office of the Vice Chancellor of Undergraduate Affairs is responsible for the overall quality of student life at UCSD. The office provides coordination and direction to more than two dozen student service departments and works closely with other components of the campus to ensure that programs, services, policies, and procedures assist students in the achievement of their educational, career, and life goals.

**Career Services Center**

Mail Code B-030  
534-3750

**Purpose and Objectives**

The Career Services Center exists to help UCSD students and alumni determine and fulfill their career goals. Thus, it offers a wide range of services related to employment and graduate education. Although sometimes overlapping, these services are divided into the following three program areas:

1. **Part-time Employment** — programs which help students obtain part-time, temporary, and summer employment;
2. **Career Advising** — programs which help students identify and pursue career goals;
3. **Professional/Graduate School Advising** — programs which help students identify and seek admission to professional/graduate schools.

**Services and Programs**

Career Services Center programs are provided in a variety of forms including drop-in advising, individual appointments, workshops, special events, and informational resources. Examples of services in each of the three program areas are outlined below:

1. **Part-time Employment**
  - (a) *Job Listings* — On and off campus job vacancies
  - (b) *On Call Services* — For students interested in short-term employment
  - (c) *Student Corps Services* — Temporary on-campus employment through campus departments
  - (d) *Special Assistance* — Individual help in finding desirable part-time employment
2. **Career Advising**
  - (a) *Career Planning* — SIGI, career survey, career consultants, skills and decision-making workshops, all-day seminars, career fair.
  - (b) *Job Search Preparation* — resume writing, interviewing, and job search strategy workshops. Videotaped mock interviews.
  - (c) *Job Seeking* — On-campus interviews, job search clubs, listings, MENTOR, job fairs.

- (d) *Special Assistance* — Individual assistance with career concerns and informational resources related to occupational research and employer identification.

3. **Professional/Graduate Advising**

- (a) *Decision Making* — Directories, special events, fairs, catalogs.
- (b) *Admissions Preparations* — Applications for admissions tests, personal statement assistance, interview preparation.
- (c) *Reference Files* — method to collect and distribute letters of recommendation.
- (d) *Special Assistance* — Individual assistance with career concerns related to professional and graduate school admissions.

Details about these programs are available at the Career Services Center.

**College Deans' Offices**

Revelle, Mail code B-021,  
534-3493

Muir, Mail code C-006,  
534-3587

Third, Mail code D-009,  
534-4390

Warren, Mail code Q-022,  
534-4731

The staffs of the college deans' offices perform many different functions. They provide help, advice, counseling, and referral in many areas. The deans' offices regularly design and coordinate activities such as Orientation, Welcome Week, Commencement, career-planning topics, procedures for applying to graduate school or professional schools, decisions about remaining in or withdrawing from school, counseling on legal problems, advising on grade problems, involvement in student governments, planning social and educational activities, handling housing concerns, assisting with specialized concerns for physically limited students, and assisting in hearing procedures regarding grievances of any kind.

Contact your college dean's office for assistance, particularly if you do not know which university office or resource would best be able to aid you with your problem or concern.

**Disabled Student Services**

Student Health Service, Second Floor  
Mail code Q-019

534-4382/534-2494 (TDD)\*

\*(Telephone for the deaf ONLY)

See "Undergraduate Affairs/Special Services Center" later in this section.

**Financial Aid**

**Student Financial Services**

All financial assistance for undergraduate and medical students and need-based aid for graduate students is administered by the Student Financial Services Office. Information relating to graduate student support in the form of fellowships and assistantships is presented in the section entitled "Graduate Studies."

The University of California, San Diego expects students and their families to bear as much of the basic, necessary costs of the student's education as their circumstances will allow. In those cases where family resources are insufficient to meet the basic educational costs, the Student Financial Services Office will attempt to assist students in obtaining supplemental support and financial aid.

The Student Financial Services Office is divided into five separate financial aid offices — one for each of the undergraduate colleges and one for the graduate division. (The School of Medicine financial aid office is housed in the medical school.) The Student Financial Services Office also includes the office of veterans' affairs. The purpose of this structure is to serve more efficiently the needs of the students who require financial assistance and veterans' benefits certification services while attending UCSD. Locations and telephone numbers are listed below.

Revelle College, 204 Matthews  
Administrative and Academic  
Complex (619) 534-3806

Muir College, 210 Matthews  
Administrative and Academic  
Complex 534-3808

Warren College, 214 Matthews  
Administrative and Academic  
Complex 534-4686

Third College, 213 Matthews  
Administrative and Academic  
Complex 534-3805

Graduate Division, 204 Matthews  
Administrative and Academic  
Complex 534-3807

School of Medicine, Medical Teaching  
Facility 534-4665

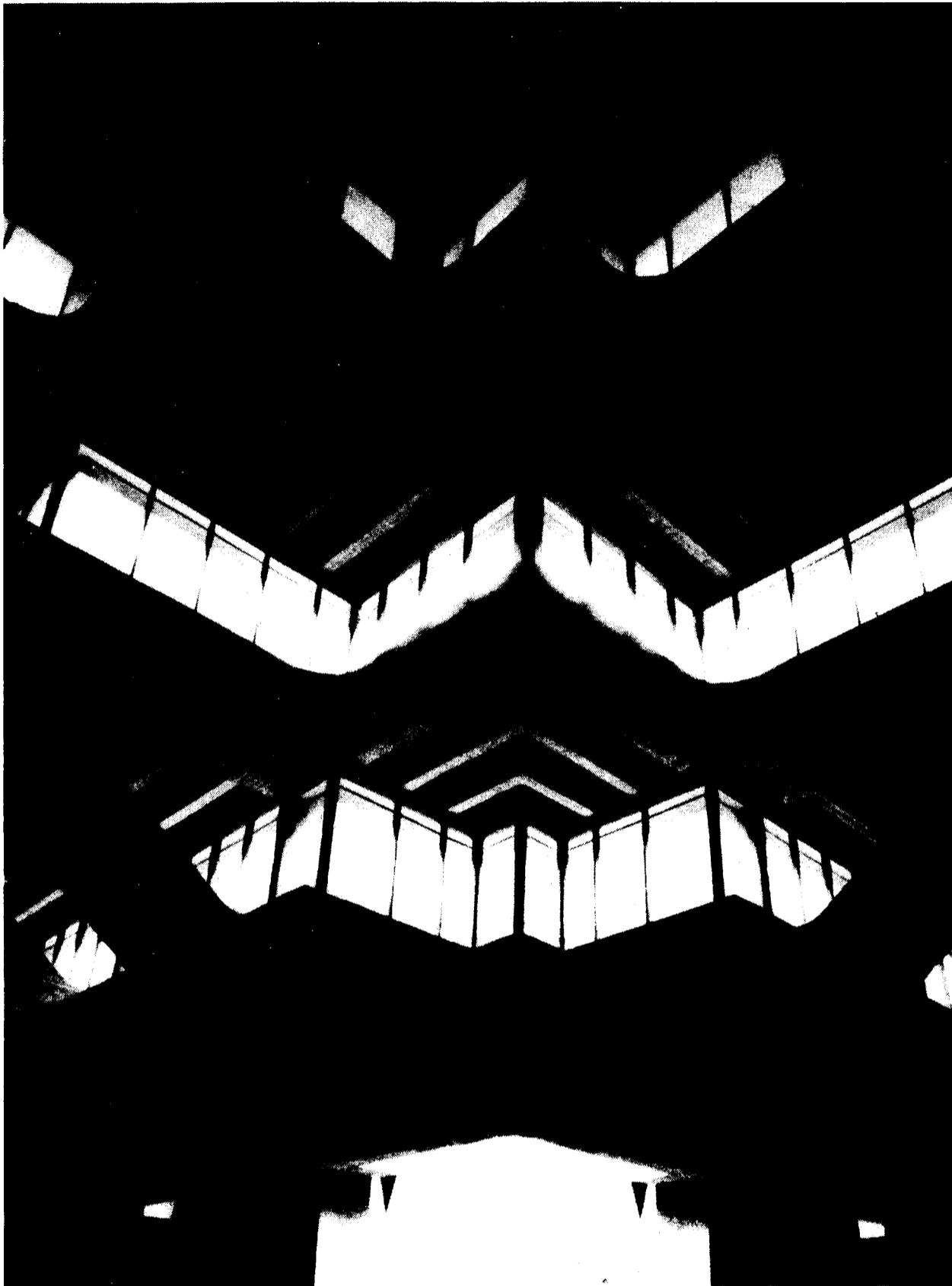
Veterans Affairs, 210 Matthews  
Administrative and Academic  
Complex 534-4483

Applications and requests for information should be addressed to the appropriate area of the Student Financial Services Office as follows: Student Financial Services Offices, Q-013, Attn: (*Your undergraduate college name or graduate division*), University of California, San Diego, La Jolla, California 92093.

No student should leave the university for financial reasons before exploring all possible avenues of assistance with a Student Financial Services counselor. Financial assistance, undergraduate scholarships, loans, grants, and work-study employment, unless otherwise designated, are processed by the Student Financial Services Office. Several publications are available from the Student Financial Services Office describing in detail the available financial assistance and veterans' services available. These are available upon request. *All information contained herein is intended to serve as a general guide and is subject to change in conformity with new and revised federal, state, and University of California regulations.*

**Applying for Undergraduate Scholarships and Fellowships (separate application required)**

The purpose of the Undergraduate Scholarship Program at UCSD is to encourage academic excellence and to honor outstanding achievement. Scholarships are awarded on a competitive basis to entering and continuing students who are United States citizens or permanent residents. Foreign students are eligible to apply for a Regents' Honorarium Scholarship and any restricted scholarships which may be applicable. Consideration is given to academic ability, scholastic promise, and, in most instances, financial need. The majority of the scholarships are available only to students who can demonstrate financial need. Honorary scholarships (those awarded solely on the basis of academic excellence) are Regents' Scholarships and Alumni awards, and normally provide only a minimal stipend.



Most scholarships are not automatically renewable, but must be reapplied for each year. Scholarship applications are available late fall quarter or early winter quarter for the succeeding academic year; the usual deadline for submission of the application materials is during early March. Recipients are selected by the Committee on Undergraduate Scholarships and Honors, which is composed of UCSD faculty members.

**Regents' and University Scholarship Program**

The highest honor which may be conferred upon an undergraduate student is the awarding of a Regents' Scholarship. Regents' Scholarships are granted by the president of the University of California and the chancellor of the San Diego campus, with consideration being given to academic excellence and promise. Regents Scholars are appointed for four years (for students entering from high school) or two years (for those going into their third year of college). A Scholar may receive an honorarium of \$500 for each year of his or her appointment. If financial

need is determined by the Student Financial Services Office, a Scholar will receive an annual stipend to cover the difference between the yearly basic cost of education and the family resources. This stipend amount is re-evaluated each year of the appointment. Other privileges, such as guaranteed on-campus housing, preferred enrollment, etc., are also offered to Regents Scholars.

University Scholarships, granted by the president of the University of California, are awarded to students of exceptional academic achievement who demonstrate financial need. A University Scholar can receive up to a \$1,200 stipend. The appointment is for one year only, but a student may reapply each year.

All scholarship applicants are reviewed for these two major awards and any other available scholarship funds.

**National Merit Scholars**

UCSD sponsors National Merit Scholars each year. Selections are made from the list of finalists who have indicated UCSD as their first college choice. Recipients may receive an honorarium of \$500 for each of their four-year appointment, or up to \$2,000 per year if financial need is determined by the Student Financial Services Office. This need is re-evaluated each year of the appointment. Other privileges, such as guaranteed on-campus housing, preferred enrollment, etc., are also offered to National Merit Scholars.

**President's Undergraduate Fellowship Program**

This program is designed to assist unusually talented undergraduate students in pursuing special studies and projects under faculty supervision. The prospective fellow and his or her faculty sponsor must submit a project proposal, including a tentative budget, by mid-May preceding the academic year for which the award is to be made. The Committee on Undergraduate Scholarships and Honors will select the fellows by early June each year. Stipends will be based on need, to be determined by the cost of the project and student's own resources.

### **David Jay Gambie Memorial Fellowship Program**

This fellowship fund was established as a memorial to David Jay Gambie, a Revelle College student. It is designed to assist undergraduate students to complete projects or special studies related to university governance and/or ecological values clarification, and is carried out under faculty supervision. Competition and selection are held in conjunction with the President's Undergraduate Fellowship Program.

### **The Alumni Awards Program**

The UCSD Alumni Association provides scholarships to undergraduates with junior and senior standing. These awards are intended to assist with the various extra expenses of college, and are given on the basis of academic and personal achievement, and future promise. Students who wish to be considered for an Alumni Award should file a UCSD Undergraduate Scholarship Application with the Student Financial Services Office.

### **Applying for Financial Assistance**

UCSD students must meet the following criteria to be eligible for financial assistance:

- Be a United States citizen or permanent resident noncitizen.
- Be enrolled and maintaining satisfactory academic progress as defined for financial aid recipients. Please refer to the *Financial Aid Consumer Handbook* for specific information.
- Not be in default on any National Direct Student Loan (now called Perkins Loan) or Federally Insured/Guaranteed Student Loan received at any institution.
- Not owe a refund on Title IV grants received at any institution.

For evaluation of financial need, all applicants must submit a Student Aid Application for California (SAAC), all required copies of the 1986 federal income tax returns with a UCSD Tax Certification/Verification form, and any other required documents. For specific instructions, refer to the *Financial Aid Consumer Handbook*, which is available upon request. The SAAC form should be filed by March 2, 1987, the UCSD priority filing date, with the College Scholarship Service, and must indicate the University of California, San Diego is to receive a processed copy

of the SAAC. UCSD's College Scholarship Service institution code number is 4836 (graduate and undergraduate applicants) and 4883 (medical applicants).

### **Receiving Financial Assistance**

UC financial assistance is funded by a combination, or "package," of grant and self-help aid. Grants and scholarships are awards that do not have to be repaid. Self-help aid may consist of a loan, which does have to be repaid, or a work-study award, which is earned by working at a part-time job while attending school, or a combination. UCSD uses an equity packaging formula, which ensures that students in similar circumstances all receive the same percentage of "gift" aid and the same percentage of "self-help" aid.

### **Pell Grant (Apply using the SAAC)**

Pell Grant is a federal aid program designed to provide financial assistance to those who need it to attend post-high-school educational institutions. Pell Grants are intended to be the "floor" of an undergraduate financial aid package and may be combined with other forms of aid in order to meet the full costs of your education. To apply for a Pell Grant, you must check the appropriate box on the SAAC and also indicate "UCSD."

### **University of California Grant Program**

The University of California Grant-In-Aid Program provides nonrepayable grants to students who demonstrate financial need. The Opportunity Grant is a state grant awarded to undergraduate students who have demonstrated financial need.

### **Supplemental Educational Opportunity Grant (SEOG)**

SEOG awards are federally funded and are granted only to undergraduate students demonstrating financial need. Awards may range from \$100 to \$4,000 per academic year.

### **Cal Grants (Undergraduate)**

Cal Grants are awarded by the California Student Aid Commission to undergraduate California residents. Current recipients must reapply each year to have their award renewed. All applicants for UC aid are required to apply for a Cal Grant by March 2, 1987; failure to do so will significantly reduce a student's UC aid eligibility. Cal Grant applicants must file both a SAAC and a Cal Grant supplement.

### **California State Graduate Fellowship**

California State Graduate Fellowships are awarded by the California Student Aid Commission to California residents in the first or second year of graduate or professional study in 1987-88. Current recipients must reapply each year to have the award renewed. Both a SAAC and a California State Graduate Fellowship supplement must be filed by March 2, 1987.

### **Work-Study**

The Federal Work-Study Program is a federally financed program that provides funds for student employment by the university or by public and private non-profit organizations. Students with demonstrated financial need will be considered. Students who receive work-study awards will receive instructions on obtaining job referrals. The work-study program provides experience in many fields, including experimental sciences, library work, recreation, computer sciences, peer counseling, and office work. Pay ranges from minimum wage and above.

### **Perkins Loans (formerly called National Direct Student Loans)**

A student is eligible for a Perkins Loan if he or she demonstrates financial need. An undergraduate student may borrow up to \$4,000 during the first two academic years. The aggregate sum for all undergraduate studies may not exceed \$9,000. A graduate or professional student may borrow up to a \$18,000 maximum, including the amount borrowed as an undergraduate, for his or her total academic career. Students under eighteen years of age are required to obtain a co-signer. For new borrowers, repayments and interest (currently 5 percent) begin nine months after ceasing to be enrolled at least half-time; for continuing borrowers, it begins in six months.

### **University Loans**

University Loans are also available. The eligibility requirements and terms, except for differences in cancellation provisions, are generally the same as for the Perkins Loans. Unlike the Perkins Loan, a co-signer is required.

### **Guaranteed Student Loan (separate application required)**

These loans are available to students who demonstrate financial need. The annual maximum allowed during the first two years of undergraduate study is \$2,625, and \$4,000 per year for the remaining years of undergraduate study, with an undergraduate cumulative maximum of \$17,250. Graduate students may borrow up to \$7,500 per academic year with an aggregate sum of up to \$54,750, including the amount borrowed as an undergraduate. Interest on these loans is currently 8 percent per year.

Repayment begins six months after the borrower leaves school or ceases to be enrolled as a half-time student.

Guaranteed Student Loan applications will be available in the Student Financial Services Office, approximately July 1, for the following academic year.

### **Supplemental Loans for Students and Loans for Parents (separate application required)**

This loan assists parents, and provides an additional resource to students who borrow under the GSL program. Independent undergraduates, graduate students, and parents of dependent undergraduates are eligible to borrow under this program. The interest rate for this loan is variable beginning July 1, 1987, with a 12 percent cap. Parents of dependent undergraduates are eligible to borrow up to \$4,000 per year (with a cumulative maximum of \$20,000) under this program. Independent undergraduates are eligible to borrow up to \$4,000 per year maximum (with a cumulative maximum of \$20,000). The first payment is due within sixty days of the date of the check. In-school deferments of principal and interest payments are available for students, and parent borrowers may also defer payments for unemployment, in-school status, and temporary disability. Deferred interest will be capitalized on a quarterly basis. Applications and further information may be obtained from the Student Financial Services Office after July 1 for the following academic year.

### **Emergency Short-Term Loan**

These limited student emergency loan funds, made possible by gifts to the university, are granted in small amounts to help non-financial aid students in critical short-term emergencies, and usually must be repaid within thirty days. There currently is a service charge of \$10 per emergency loan, and students must be enrolled in at least six units. Applications and further information are available in the Student Financial Services Office.

### **Financial Assistance, Graduate**

See section entitled "Graduate Studies" for additional types of financial assistance available to graduate students.

### **Food Services**

Administration:  
Muir Commons Annex  
Mail Code C-022  
534-4013

A wide variety of foods in various distinctive settings are available on campus. Cafeterias and/or restaurants are conveniently located close to the residence halls throughout campus. Additionally, there are restaurants located adjacent to the School of Medicine, Third College, and Scripps Institution of Oceanography. Students and the public may eat at any of these facilities, and hours will vary depending on locations.

For students living in the residence halls, the board plan is mandatory; it is optional for apartment residents. Residence Hall students may choose a full board plan, a fourteen-meal plan, or a ten-meal plan. For the cost of these plans, please refer to the "Housing" section below.

Campus food services also offer several meal plans to commuters and apartment residents on a quarterly basis, at a cost based on the board rate. The meal plans offered are: nineteen meals, any fourteen meals, any ten meals, any five meals, and five meals, no dinners. Some apartment residents prefer to do their own cooking; those who choose a board plan usually select one of the five-meal plans or the ten-meal plan.

Resident students will use a photo I.D. card for meal plan identification, entitling them to eat in any of the full-service cafeterias or most restaurants located around campus. Each restaurant has its own unique atmosphere, and menu items differ from one location to another.

Other food service facilities include the Pub and the Food Co-op., located in the Student Center; the University Bookstore Sunshine Store, the Ice Cream Hustler, Ché Cafe, and the Sundry Store located on Revelle Campus. Also available for a limited selection of food stuffs are a variety of vending machines located in key traffic locations throughout all the campuses.

## **Housing**

### **On-Campus Housing**

Administration: Building 206  
Matthews Administrative and  
Academic Complex  
Mail code Q-041  
534-4010

### **Single Undergraduate Housing**

Revelle, John Muir, and Third Colleges have residence hall accommodations. Residence halls are arranged around a suite plan with students sharing a common living-study area. Most of the rooms are designed for double occupancy. The limited single rooms are usually reserved by returning students. The residence hall contract provides for a mandatory board plan. The estimated cost for room and board is approximately \$4,700 plus a \$60 deposit for the 1987-88 school year (fall-winter-spring quarters) and will vary depending upon payment and meal plans chosen and type of room accommodation.

Single and double rooms in apartments at John Muir and Third Colleges are available. UCSD also offers two-bedroom apartments for four single undergraduate students of Third College, Warren College, and Revelle College. A board plan is available for all apartment dwellers on an optional basis.

A housing brochure with an application for on-campus housing is sent, beginning in February, to all who have indicated their interest in on-campus housing on their application for admission. Students must return the housing application with a \$15 nonrefundable application fee and file a Statement of Intent to Register form to be eligible for housing. Contracts are issued in batches based on a priority system and as space permits beginning in June and about every four weeks thereafter throughout the summer. The priority system is explained in detail in the housing brochure.



The deadline for guaranteed housing for fall 1987-88 was May 1, 1987 for new freshmen and transfers living more than a fifteen-mile radius from campus (determined by zip code). However, applications are still being accepted. Students guaranteed housing are accommodated first. First-time freshmen from outside commuting distance (determined by zip code) have priority for new student space in the residence halls and some single undergraduate apartments on a space available basis.

The Housing Administration Office recommends that students who are still on the waiting list telephone the office in late August for further information.

The resident dean of the applicable college assigns rooms in the residence halls or spaces in the apartments. The Housing and Food Services Administration Office, located in Building 206 Matthews Administrative and Academic Complex, administers housing contracts, accepts housing payments, and handles other details related to housing contracts.

Housing for married students and single graduate students is available in studio, one-, two-, and three-bedroom apartments in the Coast and Mesa Complexes.

### **Married and Single Graduate Housing**

Married students may reside in one- or two-bedroom apartments. Married students with children may choose between two- and three-bedroom apartments. Single graduate students have the choice of studio or two-bedroom apartments, although if a two-bedroom apartment is selected there must be at least one roommate who is also a graduate student. All apartments are unfurnished except for stoves, refrigerators, garbage disposals, and living room drapes. Mesa Apartments are carpeted, and Coast Apartments have floor tile throughout. Coin-operated washers and dryers are available in the community buildings on the apartment grounds. Current rental rates for two-bedroom apartments range from \$385-\$495 per month and are subject to change with thirty days' prior notice. There is an extensive waiting list for the apartments.

You may write, apply in person, or telephone the Residential Apartments Office, S-007, University of California, San Diego, La Jolla, California 92093 (619) 534-2952, for brochures and applications for Coast or Mesa apartments.

### **International Center**

(Located at the corner of Hutchison Way and Gilman Drive)  
Mail code Q-018  
534-3730  
Facility reservation: 534-4022

The International Center assists U.S. students going abroad as well as foreign students, scholars and families, and facilitates interaction among all internationally minded UCSD students, faculty, and staff.

Services to students going abroad include advising on a wide range of study, work, and travel opportunities through the UCSD Opportunities Abroad Office, and administration of the systemwide UC Education Abroad Program.

The International Center is also responsible for the proper documentation of all nonimmigrants on campus, including foreign students, postdoctoral fellows, and faculty. All new students, researchers, and faculty who are citizens of countries other than the United States must bring their passports to the International Center as soon as possible after their arrival on campus so that their visa status may be verified. Departments are required to advise the International Center of both the arrival and departure of visiting foreign faculty members. In addition to maintaining this documentation, the office, along with the Friends of the International Center, provides hospitality programs, counseling, and other services to members of the foreign community.

The staff and Friends of the International Center as well as the International Club sponsor a variety of international/intercultural programs and services for all members of the UCSD community. These include lectures, language exchanges, a tutoring program, linkages with international faculty specialists, and weekly international cafes.

The International Center facility also includes a resale shop, a reservable conference room, and a meeting/office facility for Oceanids, the women's volunteer support organization for the university.

### **Psychological and Counseling Services**

Central Location:  
1003 Humanities/Undergraduate Library Building, Revelle College  
Mail code B-004  
534-3755

Psychological and Counseling Services provides professional assistance to students having difficulty in coping with any of a wide array of problems. In addition, members of the staff offer professional consultation to the university regarding matters of student behavior to prevent problems and enhance the student experience.

Specific problems for which students may seek help include loneliness and isolation, personal problems, homesickness, parent/family problems, difficulties with studying, concentrating and test taking, relationship/marital problems, sexual difficulties, educational/career questions, depression, and anxiety.

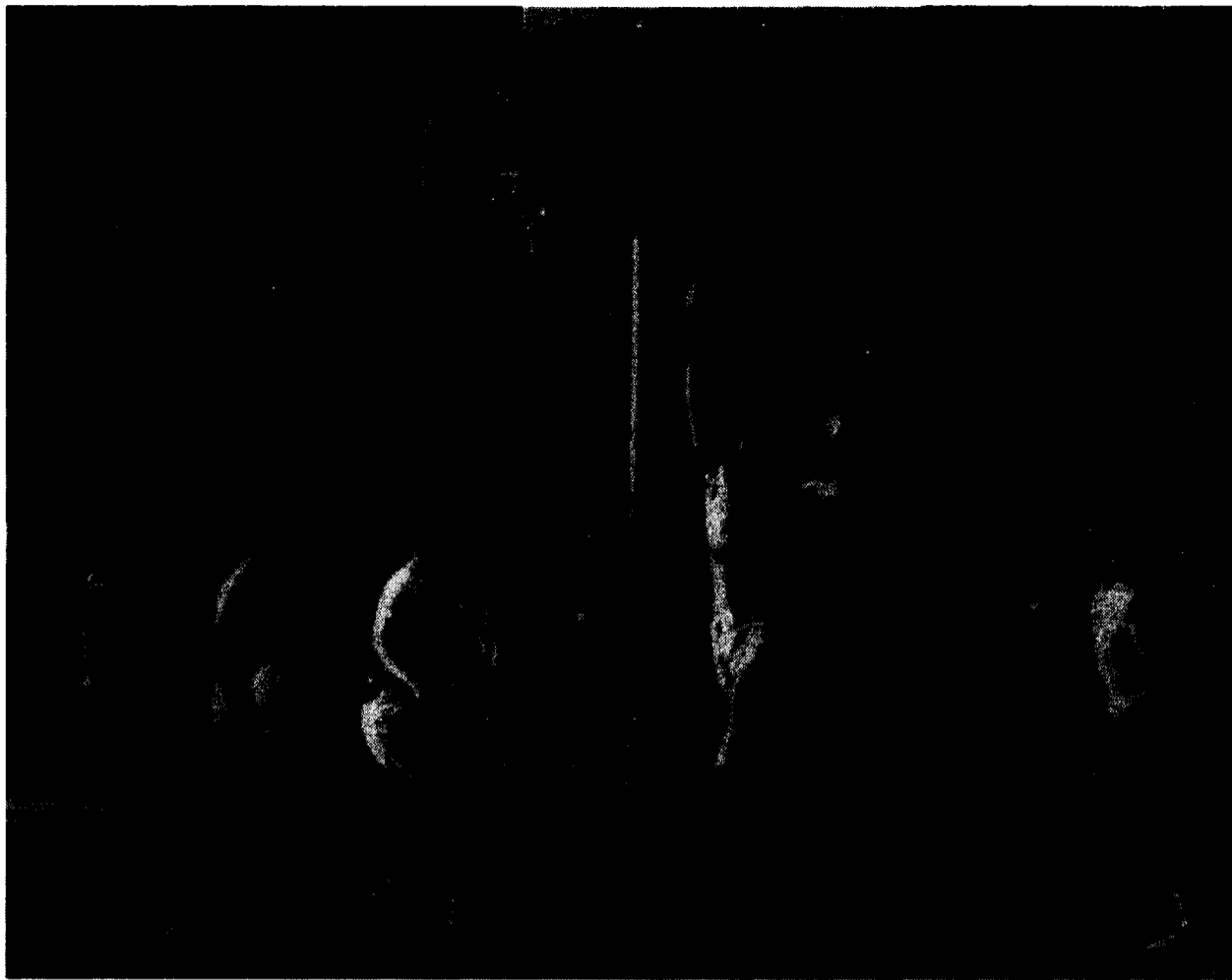
Individual and group counseling, psychotherapy, marriage or relationship counseling, sex therapy, family therapy, behavioral and hypnotic techniques, and many issue-related groups are provided for dealing with these problems.

During any year support groups, such as ones for ethnic minorities, reentry students, women in medicine, men in medicine, women in science and engineering, and gay students are offered. Time-limited focus groups include assertion training, stress management, test anxiety reduction, decision making, coping with alcohol and drug abuse, eating disorders, enhancing creativity, weight management, and life-style workshops.

Members of Psychological and Counseling Services are clinical and counseling psychologists and social workers. The service has offices at all colleges in addition to the central location.

Services are available to any regularly enrolled undergraduate, graduate or medical school student, by contacting the central office. The counseling relationship is private and confidential.





## Recreational Facilities and Sports

Gymnasium  
Mail code C-017  
Physical Education: 534-4032  
Recreation: 534-4037

Two gymnasiums, tennis courts, natatorium, playing fields, and the new Canyon View Recreation Center (fifty-meter pool, racquetball courts, and Warren weight room) are important centers of campus life and may be used by all students at no charge. A nominal fee is charged for sailing, waterskiing, rowing, and windsurfing privileges at the Mission Bay Aquatic Center, as well as for recreational privileges for spouses and children of UCSD students. Call 488-1036 for information.

### Recreation Clubs

Campus recreation clubs play a vital role in the students' social life on campus. Many activities are offered quarterly such as jazz, racquetball, outdoor recreation, karate, outing, snow skiing, and SCUBA diving. Clubs meet on a weekly basis for activity sessions and sponsor events such as aikido and karate tournaments, seminars, folk dance workshops and festivals, films, soccer meets, and ski trips at minimal cost to students. Call 534-4037 for more information.

## Intercollegiate Athletics

The University of California, San Diego Intercollegiate Athletics Program, under the auspices of the Department of Physical Education, has one of the most extensive sports programs in the country. With twenty-five teams to choose from, students of varying interests and abilities have an open door to athletic experiences. New teams are formed based on student interest and the availability of funds and facilities. The same athletic philosophy governs men's and women's athletics, and both sexes share successfully in the use of the facilities, equipment, and financial resources. No athletic scholarships are provided, but the values derived from participating with other athletes, receiving instruction from qualified coaches, and striving for excellence are numerous.

UCSD competes as a Division III member of the NCAA (National Collegiate Athletic Association). Some teams are members of Southern California leagues, while other teams participate as independents. Most competition takes place in Southern California, although some teams travel to Northern California and out-of-state when funds are available. Several teams and individuals have qualified for and enjoyed participation in national championships, with many ranking in the top 10. The 1981, 1984 and 1986 women's

volleyball teams won the National Championship as did the 1985 women's tennis team. Second place in the NCAA Division III National Championship went to the UCSD men's golf team, women's swim team and men's soccer team, while the UCSD men's swimming and diving teams placed third nationally. Intercollegiate athletics at UCSD offers an ideal way to complement and supplement academic experiences. The wide variety of offerings should provide something of interest to everyone. It is hoped that interested students will become involved in the fun and challenge of intercollegiate athletics at UCSD. Call 534-4211 for more information.

### Intramurals

The UCSD intramural sports program offers a diversified schedule of quarterly sports activities for all students. Activities range from the traditional football, basketball, and softball to the more innovative innertube waterpolo and team tennis. Leagues are formed to meet the competitive desires of the participants and include those for both the highly skilled performer and those for students merely interested in fun and exercise. Major emphasis is placed on a coed sports program (men and women competing on the same team) which enhances social interaction while promoting physical fitness. Please contact Intramural Sports at 534-4037 for further details.

### Physical Education

(See "Physical Education" in the "Courses, Curricula, and Programs of Instruction" section of this catalog.)

The Department of Physical Education, with the sponsorship of the vice chancellor of Undergraduate Affairs, offers all UCSD students the opportunity to participate in a Lifetime Physical Fitness Program. This voluntary program is designed to help students establish and maintain a healthy and physically fit way of life by providing information and guidance for the sound development of your body as well as your mind. The program focuses on three major components of a healthy life-style: good nutrition, regular exercise, and effective stress management. An excellent and expert faculty and staff will help you attain a higher level of fitness in a manner which is most appropriate to you and your interests. For more information, please call 534-3495.

### Recreation Classes

Recreation classes are open to all campus personnel in a variety of activity areas such as jazz dance, belly dancing, horse-back riding, cooking, and conditioning.

These classes are noncredit and are supported by participant fees. Call 534-4037 for more information.

### Wilderness Activities at UCSD

The location of UCSD encourages participation by its students, faculty, and staff in hiking, backpacking, cross-country skiing, canoeing, and other outdoor activities associated with wilderness or near-wilderness areas. Various organizations and programs have been developed to take advantage of the opportunities so readily accessible in the surrounding areas.

*The Wilderness and Human Values*, a lecture-discussion class offered each spring by John Muir College, is open to all UCSD students. It considers the role of wilderness in shaping America's beliefs, attitudes and cultural values, and confronts problems related to the need to preserve these areas. For further information about the course call the Muir Interdisciplinary Studies Office, 534-3589.

*Wilderness Discovery* program is an intensive eleven-day outing designed for incoming students of Warren College. The emphasis is on creating stressful situations that require individual and group reaction. For more information contact the Warren College Residence Halls office, 534-4343.

*The Wilderness House* is designed for Muir student residents especially interested in wilderness and outdoor activities, and is located on the fifth and sixth floors of Tioga Hall. Call the Muir College Residence Halls Office for more information about this program, 534-4202.

*UCSD Outdoor Recreation program* is a service program for all students, faculty, and staff. It offers an equipment rental service, seminar/workshop, leadership training, trips, and an information resource center. Please call the Campus Outdoor Recreation Office, 534-4037.

### Office of Religious Affairs

Building B, Student Center  
Mail code B-009  
534-2521

See "Undergraduate Affairs/Special Services" later in this section.

### Student Center

Mail code B-023  
For information dial: 43362  
Administrative Offices: 534-4022  
Hours: 8:00 a.m.-4:30 p.m.

The Student Center provides the UCSD community with services and programs beyond the teaching and research functions of the university. It is a place for students to meet, relax, grow and develop, while providing services and activities not available elsewhere on campus. With a diverse assortment of services, organizations and activities, the center is able to meet the demands and needs of the student population.

Located in the center of campus, the Student Center serves many needs outside the classroom, related to personal and organizational services and programs. The Information Desk, KSDT radio station, CIEE Travel Service, the Box Office, Gameroom/ Lounge, many student organizations, and conference rooms assist in meeting the needs of the UCSD student population. The student-run co-ops and enterprises located here include Assorted Vinyl Records, the Bike Shop, the Food Co-op, the General Store Co-op, Groundwork Books, the Computer Science Co-op, Soft Reserves, Lecture Notes, and the Women's Center.

The Ché Cafe restaurant, the Recycling Co-op and the *Guardian* newspaper offices are located on Revelle campus, southeast of the Revelle College Office of the Provost.

Also located here are Undergraduate Affairs services including the administrative offices of the Student Center, the AS/Student Organizations offices and the University Events office. Housed in Bldg. B, adjacent to the Student Center, are the offices of the Early Outreach Program, OASIS, Off-Campus Housing, Legal Services, the Office of Religious Affairs, and the Student Affirmative Action Committee (SAAC).

The Crafts Center, located next door to the Student Center, offers instruction in ceramics, photography, stained glass, and other crafts to students, staff, faculty, and the community. Special programs are also available to children during the summer months. The Grove Cafe, housed within the Crafts Center offers a variety of specialty coffees and pastries.

The Triton Pub offers food, beer, and wine along with entertainment and games. The International Center hosts a

variety of programs for foreign students, staff, and faculty. In addition, the facility is available for on-campus or community use by calling 534-4022.

### Student Information Center

Mail code B-023  
534-3362  
Hours:

8:00 a.m.-10:00 p.m. Mon.-Thurs.  
8:00 a.m.-10:00 p.m. Fri.  
10:00 a.m.-10:00 p.m. Sat.  
12:00 noon- 8:00 p.m. Sun.  
8:00 a.m.- 4:30 p.m. Summer and  
Vacation hours

Located in the Student Center main lobby, the information desk serves the campus community as well as the surrounding community, disseminating information and providing a variety of services benefitting the students, faculty, staff, and the general public.

If the student staff cannot answer your question, they will refer you to the proper person or agency.

### Student Government/Student Organization Support Services

Second Floor North, Student Center  
Mail Code B-023  
Organizations: 534-4083  
Associated Students: 534-4450  
Business Office: 534-4399  
Hours: 8:00 a.m.-4:30 p.m.  
Monday-Friday

There are over 150 student organizations on campus offering students the opportunity to become involved in academic, cultural, social, political, and religious activities, as well as student run medias. In addition, the Associated Students Government provides students with practical experience in dealing with programming, financial, and political issues. The Student Government/Student Organization Support Services staff works with the A.S. and organizations in developing and implementing programs and activities which are designed to meet the students' needs. The Student Government/Student Organizations Support Services Office works with student organizations and the A.S. in managing activity fee funds, providing financial advice, and assisting in areas of fund raising and programming.

Registration for student organizations begins in fall and continues throughout the academic year. Students who are interested in forming or joining an organization should contact this office for registration forms, financial and program advice. The Student Government/Student Organizations Support Services staff offers you the opportunity to get involved with dynamic and active student organizations and student government.

### Greek Organizations

A unique feature of UCSD's Greek system is the small size of each chapter. Sororities have about fifty members each, while fraternities vary from twenty-five to eighty members. Leadership and membership opportunities are open to all who are interested. The current National Panhellenic Council consists of Alpha Omicron Pi, Delta Gamma, Kappa Kappa Gamma, Pi Beta Phi and Sigma Kappa. The Intra-Fraternity Council is made up of Delta Tau Delta, Delta Sigma Phi, Pi Kappa Phi, Phi Delta Theta, Sigma Alpha Epsilon, Sigma Alpha Mu, Sigma Nu, Tau Kappa Epsilon, and Zeta Beta Tau. These groups of nationally recognized fraternities and sororities have been growing over the past few years and have made increasing contributions to the campus and community.

### Student Health Service

Mail code Q-039  
534-3300

Comprehensive primary health care is provided without charge during the academic year for all student registration fee-paying students. Services are available during the summer for a modest fee. A well-qualified medical staff is in attendance at the Student Health Center, and students are encouraged to come in to discuss any health problem. Professional and confidential attention is assured. Students can be seen on a walk-in basis or by appointment from 8:00 a.m. to 4:30 p.m., Monday through Friday.

The Student Health Service offers Women's, Men's, Sports Medicine, and Dermatology Clinics on a scheduled basis. Health education and promotion and birth control services are provided. Low cost pharmacy, allergy desensitization, and immunization services are available as well as optometric and dental care.

Entering students are requested to complete and return a Medical History form prior to registration. The information submitted to the Student Health Service is kept confidential and is carefully reviewed to help provide optimal health care. Students are also urged to submit a physical examination form completed by their family physician, particularly if they plan to enter into intercollegiate athletic competition.

Although undergraduate, graduate, medical, and nurse practitioner students may have unlimited visits with the Student Health Service staff, students requiring medical or surgical care beyond that available from the staff should be prepared to meet the costs of such care. All students are strongly urged to provide themselves with adequate sickness and accident insurance.

A *Student Limited Insurance Plan* (SLIP) is provided without charge to all eligible students to help them defray some of the expenses of necessary additional *outpatient* care. Within specified limits, this plan provides benefits for laboratory tests, x-rays, consultations with specialists, emergency room care, and ambulance transportation.

A *Voluntary Insurance Plan* (VIP), available for purchase by students each quarter, adds benefits for hospitalization, surgery, and major medical expenses. The pre-

mium for this insurance plan may be paid along with student fees.

Brochures describing these two insurance plans and their limitations, exclusions, and open enrollment periods, are available at the Student Health Center. An insurance representative at the center may be consulted regarding the plans.

### Undergraduate Affairs/ Special Services Center

Building B, Student Center  
Mail code B-009

The Undergraduate Affairs/ Special Services Center (UA/SSC) comprises the following units: Off-Campus Housing and Transportation, Legal Services, Disabled Student Services, Office of Religious Affairs, Student Affirmative Action, and the Office of Student Judicial Affairs. This office also has the responsibility of student conduct and discipline as well as grievance procedures under Titles VI and IX, Section 504 of the Rehabilitation Act of 1973, and Right to Privacy as it affects students. UA/SSC also has staff responsibility for the coordination and effective implementation of all aspects and procedures of the UCSD Student Affirmative Action Program.



The goals of the UA/SSC are to ensure effective delivery of services to our student population, and to assure fair, consistent, and equitable administration of student conduct and student affirmative action procedures and requirements. All of the programs under the UA/SSC are housed in Building B of the Student Center with the exception of Disabled Student Services which is located in the Student Health Center.

### **Judicial Affairs**

534-6225

Judicial Affairs' aspect of this program consists of the administration of student judicial affairs which includes campus-wide coordination of student conduct, including graduate students, monitoring of compliance requirements of Titles VI and IX, Section 504 of the Rehabilitation Act, Right to Privacy as it affects students, and the Student Diversion Program. In addition, the director also provides legal advice and consultation to all Undergraduate Affairs units including the vice chancellor, Undergraduate Affairs and the college and resident deans.

### **Student Affirmative Action**

534-6708/2573

The responsibility of this office is to initiate and implement an active and intensive Student Affirmative Action Program for the recruitment and retention of undergraduate students from the affirmative action population.

At present, Student Affirmative Action is composed of the following programs:

Student Affirmative Action Committee (SAAC)/SAAC

Internship Program/SAAC Programming

The Student Affirmative Action Committee comprises six affirmative action organizations, such as: Asian/Pacific Students Alliance, Black Students Union, Disabled Students Union, MEChA, Native American Students Alliance, and the Women's Resource Center. Each student affirmative action organization elects one representative and alternate to participate on the Student Affirmative Action Committee. These elected representatives serve a minimum of one academic year as voting members of SAAC.

The SAAC Internship Program is the vehicle by which SAAC is able to review and evaluate the Undergraduate Affairs programs and units to assure responsive-



ness to student affirmative action. SAAC interns also provide the factual and evaluative basis for appropriate recommendations from SAAC to the vice chancellor for Undergraduate Affairs. The internship program started in 1976 and since its inception, SAAC has had approximately twenty-one student interns performing research and evaluation of assigned Undergraduate Affairs units. Upon completion of the assignment, the interns are required to submit to SAAC a written evaluation report with recommendations to the vice chancellor for Undergraduate Affairs for appropriate action.

SAA programming was established in an effort to assist SAAC constituent organizations and other student groups engaged in planning programs which improve or enhance the goals of the UCSD student affirmative action program.

### **Student Legal Services**

534-4374

Student Legal Services (SLS) provides advice, counsel, and assistance to UCSD students in legal matters. It prepares and drafts legal documents for students seeking to represent themselves in court. These include Petitions for Dissolution, Name Change, Adoption and Complaints for Unlawful Detainer and Answers to such Complaints. Student Legal Services also counsels and prepares students for court appearances, i.e., Small Claims, Municipal, Traffic and Misdemeanor Arraignment hearings. As SLS cannot

represent students, if such representation is deemed necessary the student is referred to an outside attorney or agency specializing in that particular area of the law.

### **Student Women Referral Services (SWRS)**

534-5793

Student Women Referral Services is engaged in a concerted and comprehensive effort to educate the UCSD community about issues, problems, and concerns affecting the status of women. The office acts as a clearinghouse for information about current issues and concerns affecting women, as well as a focal point for the coordination of workshops, services, activities, and programs that focus on women's issues. Such programs/services include (but are not limited to): the Rape Prevention and Education Program (RPEP), the UCSD Escort Services, the Women's Resource Center, sexual harassment counseling, Student Legal Services, and Psychological and Counseling Services. These programs contain strong components of particular usefulness and interest to women. An extensive referral network is maintained both with UCSD and community resources.

**Rape Prevention Education Program (RPEP)**

534-4374

The Rape Prevention Education Program seeks to increase awareness about the problem of sexual assault and to prevent and decrease the incidence of this crime. The goal of the program is to educate both men and women by dispelling the many myths that abound, by providing and publishing updated printed material such as brochures and pamphlets, and by providing programs and workshops on rape prevention and education, including self-defense techniques and strategies, assertiveness training, and coping mechanisms. Counseling and extensive referrals are available.

**Off-Campus Housing**

534-3670

The Off-Campus Housing Office provides a resource and assistance service to the commuter student. This office maintains an up-to-date listing service for a variety of rentals in various areas near the campus. These listings, advertised on bulletin boards within the office, include individual houses, condos, and apartments, as well as roommate, room in a private home, and work-exchange situations. Listings are not mailed as availability changes daily.

UCSD is located in the midst of a resort area, commanding higher rents than most other areas in San Diego County. Lower rentals may be found as you travel south and inland of the campus. A general rule is, the closer to the beach the higher the rent.

Approximate monthly costs for unfurnished rentals, excluding utilities, are:

- \$225-\$400 — for furnished room with kitchen privileges,
- \$225-\$450 — for own room in a home with other students (roommate),
- \$300-\$600 — for studio or bachelor apartment,
- \$400-\$700 — for one-bedroom apartment or house,
- \$500-\$1,000 — for two-bedroom apartment, condo, or house,
- \$750-\$1,300 — for three-bedroom apartment, condo, or house,
- \$900-Up — for four-and five-bedroom house.

Furnished rentals will generally cost an additional \$50 to \$100 per month.

It is suggested that students who wish to find off-campus housing plan to make arrangements early by consulting the available rentals posted in the office. The best time to begin looking for housing is from two to three weeks before the start of the fall quarter, and one to two weeks before the spring and winter quarter.

During September, the office operates a Temporary Emergency Housing Program. The program provides dorm-style lodging for students while they locate permanent housing. Space is limited, and reservations are recommended.

A variety of house-hunting aids are available in the housing office: current newspapers, rental publications, free rental agency contacts, landlord/tenant handouts, and two courtesy telephones. Additionally, for students seeking a roommate or room in a private home, there is now available a "ROOMMATE HOTLINE." The hotline is a recording of the roommate/room rental listings received that particular day. The recording is available after 4:30 p.m. Monday through Friday, and anytime on weekends. Call (619) 534-3670.

The Off-Campus Housing Office is supported by student fees and its services are available to registered students only. Students are required to bring a registration ID card or a letter of acceptance when using the office services.

**Religious Affairs**

534-2521

The Office of Religious Affairs is a cooperative venture of representatives from various religious denominations for the purpose of providing religious counseling and other religiously oriented programs to students, faculty, and staff at UCSD. The office also serves as a theological resource concerning current moral and ethical issues, as well as a center for facilitating communication between the university and community religious organizations.

**Disabled Student Services**

Student Health Service, Second Floor  
Mail code Q-019  
452-4382/452-2494 (TDD\*)  
(Telephone for the deaf ONLY)

The primary objective of the Office of Disabled Student Services is to integrate and mainstream disabled students into general campus programs and activities.

The ability of each disabled student to function independently in the educational environment is the ultimate goal.

The following services are available to meet the individual needs of disabled students:

- Disability Management Advising
- Academic Support Coordination: Readers, Interpreters, Notetakers
- Special Equipment Loan Service: Manual Wheelchairs, Powered Wheelchairs, Cassette Recorders, Talking Calculators, Print Enlargers
- Equipment Repair Service: Minor repairs to wheelchairs and other mobility-related equipment are available at Disabled Student Services by appointment. Appointments are not necessary in emergency situations.
- On-Campus Transportation: Disabled Student Services operates a prior-scheduled on-campus transportation system for disabled students. Prior-scheduled pick-up times can be reserved by disabled students from 8:45 a.m. to 4:00 p.m., Monday through Friday, for on-campus transportation needs. Prior notification by regular users of the transportation system is required by Thursday at 12:00 noon in order to change their schedules for the following Monday through Friday. New users of the transportation system can schedule their transportation needs for the current sign-up week. On-call transportation requests can be made by disabled students with a twenty-four-hour notice, but on-call transportation services will be provided only after all prior-scheduled pick-ups have been completed.
- Special Parking Coordination
- Special On-Campus Housing Coordination
- Registration/Enrollment Assistance
- Test-Taking Arrangements
- Resource Library
- Liaison with the California State Department of Rehabilitation
- Referrals to Resources, Services, and Agencies
- Accessibility Map for the Disabled

*Documentation of disability will be required for the delivery of most services for disabled students.*





## **University Events and Student Activities Office**

Student Center  
Mail code B-023-E  
534-4090

The University Events and Student Activities Office is a central resource for programming of events and activities at UCSD. The office is responsible for a number of programs and services. It provides the campus and community with programs in the areas of fine arts, films, speakers, and popular entertainment.

The staff is a central resource for programming advice and assistance in the areas of event planning, publicity, ticket handling, technical set-up, and contracting. The management of the Central Box Office provides for the sale of tickets to most campus events as well as tickets sold on the Ticketmaster and Teleseat systems to events in town and around the country. Administration of the Master Calendar for Public Events provides a clearinghouse for all public events.

Technical services are provided for campus groups needing sound systems, staging, and lighting for events. The office is responsible for assisting in the development of student organizations and administers the Leadership Training Program for student leaders. Students wanting to get involved in campus activities should come to the University Events and Student Activities Office in the Student Center, where the staff will happily assist you in finding those activities of special interest to you. Make the most of your college experience — get involved!

## **Veterans' Affairs**

Building 210 Matthews Administrative and Academic Complex  
Mail code Q-013  
534-4483

### **Eligibility**

The following persons may be eligible for federal veterans' educational benefits:

- 1) Sons, daughters, spouses, and surviving spouses of veterans who died in service; who died as a result of a service connected disability; who became permanently and totally disabled as a result of a service connected disability; who died while a disability so evaluated was in existence; or who have been listed as missing in action, captured, detained, or interned in line of duty by a foreign government or power for more than ninety



days. 2) A serviceperson who has completed a minimum of 181 days of active duty, part of which must have been after January 31, 1955, and has entered service prior to January 1, 1977. 3) A serviceperson who entered service after December 31, 1976 and who contributed to an education fund. 4) Members of the Selected Reserve who enlist, reenlist, or extend an enlistment for a six-year period between July 1, 1985 and June 30, 1988. Or 5) A veteran of World War II or thereafter who has a service connected disability and needs vocational rehabilitation. In addition to federal veterans' educational benefits, this office can assist you in attaining California benefits if you meet the requirements listed in 1) above and if the veteran was a resident of California.

### Academic Requirements

A student receiving veterans' benefits is required to maintain satisfactory progress and conduct according to standards established and enforced by the institution, fully and clearly published in this catalog under "Academic Regulations."

All students who are on probation more than one quarter or who are subject to academic disqualification are considered to be making unsatisfactory progress according to V.A. regulations and are not eligible to receive their veterans' benefits. Their status will be reported to the Veterans Administration.

### Other Services

In addition to certifying paperwork to initiate a student's veterans' benefits, the Office of Veterans' Affairs staff can answer questions about check problems or other programs administered by the Veterans Administration such as tutorial assistance and VA work-study, or can provide you a phone number so that you can make an inquiry to the Veterans Administration Regional Office.

Upon admission to the university, please contact the Veterans' Affairs Office to request certification of VA educational benefits.

## OTHER SERVICES AND FACILITIES

### UCSD Alumni Association

Building 301 Matthews Administrative and Academic Complex upstairs  
Mail code Q-066  
534-3900

Former students are automatically members of the UCSD Alumni Association after attendance of six quarters at UCSD. Friends of the university are invited to join the UCSD Alumni Association. This organization affords its members participation in university programs, and sponsors a number of vital activities including scholarships, legislative relations, and student programs.

Members of the UCSD Alumni Association enjoy many special benefits, including library privileges on all University of California campuses (former students only), a subscription to the *Alumni Quarterly*, a discount on the first enrollment in a University Extension course, use of UC vacation centers throughout California, and participation in special-rate travel programs.

Students and friends are invited to visit the Alumni Association Office at the UCSD address noted above.

### Art Galleries

#### Mandeville Art Gallery

Mandeville Center, Room 101  
Mail code B-027  
534-2864

Mandeville Art Gallery exhibitions cover a wide range of fields, with an emphasis on changing exhibitions of contemporary works. Last year's exhibitions included: Photography: Suggestions and Facts; Selected Works from MOCA's Lowen Collection; Young American Artists V: Harkness, Hawkinson and Wickman; UCSD's Joe Brainard Collection; The Situated Image; and others.

Gallery hours are from 12:00 noon to 5:00 p.m., Tuesday through Sunday. The gallery is closed Mondays and holidays. There is no admission charge.

#### Mandeville Annex Gallery

Mandeville Center, Room B-118  
Mail code B-027  
534-3102

The Mandeville Annex Gallery is a graduate and undergraduate student gallery. A new exhibition is mounted each week of the quarter. Included in the exhibition schedule are visual arts group class shows and M.F.A. exhibitions. Gallery hours are from 12:00 noon to 5:00 p.m., Monday through Friday. There is no admission charge.



## Crafts Center

Mail code B-023-D  
534-2021

Located in the center of the campus, the Crafts Center offers studio and art/crafts instructional facilities in ceramics, photography, jewelry, drawing, and other crafts. The center provides personal enrichment and creative educational opportunities to individuals wishing to develop artistic skills in an active studio-classroom situation.

The Grove Gallery is a part of the center, and offers ongoing exhibits of campus and community artists. The Grove Gallery Store sells a wide variety of handmade crafts and other gift items.

Registration for Crafts Center activities takes place the first week of every quarter at the center. Specific classes, schedules, and course fees information can be obtained by calling 534-2021.

## Day Care Center

Mail code Q-031  
534-2768

The UCSD Day Care Center serves the children (from as soon as they walk to age five and one-half) of UCSD students, staff, and faculty. Subsidized day care is avail-

able to students as determined by the State Department of Education guidelines for low-income families. Nonsubsidized day care is available full-day, everyday, Monday through Friday. Regular hours of operation are 7:45 a.m. to 4:45 p.m. including breakfast, lunch, and an afternoon snack. For further information or enrollment procedures call or visit the center, which is located across the street from Graphics and Reproduction Services, Building 510, Matthews Administrative and Academic Complex.

## Duplicating Services

Building 510 Matthews Administrative and Academic Complex  
Mail code Q-031  
534-3020

Several kinds of duplicating services are available on campus. The Staff Personnel Office and the University Bookstore have self-service photocopying machines which make copies for \$.05 a page.

The copier machine located in Graphics and Reproduction Services, Building 510 Matthews Administrative and Academic Complex, is especially good for thesis work requiring excellent copy quality. Copies cost \$.05 each, and students are requested to reserve time in advance for the use of the machine.

## Parking & Transportation Services on Campus

Building 400 Matthews Administrative and Academic Complex  
Mail code Q-040  
534-4223

Parking permits are required on the UCSD main campus from 7:00 a.m. to 5:00 p.m. Monday through Friday and at Scripps Institution of Oceanography from 7:00 a.m. to 5:00 p.m. every day, unless otherwise posted. This requirement is enforced by the Department of Community Safety through the issuance of parking citations.

Parking permits are available at the Central Cashier, Building 401 Matthews Administrative and Academic Complex. Student "S" permits must be paid in advance from date of purchase through June 30. Student permits are valid only in yellow-striped spaces. A grace period during Welcome Week of the fall quarter *only* allows students to park in yellow-striped spaces without a permit. Effective the first day of classes of fall quarter, all vehicles parked on university property must display a valid parking permit.



If you have any questions about parking phone 534-4223. Those who are interested in joining a carpool, forming a van-pool, or getting information on San Diego Transit or North County Transit phone 534-4235.

### Post Office

104 Argo Hall, Revelle Campus  
Mail code B-024  
534-2052

The Argo Hall Post Office is a contract station operated under the rules and regulations of the U.S. Postal Service where stamps, money orders, and other postal items may be purchased, and parcels and letters mailed. It is open from 8:30 a.m. to 3:45 p.m., Monday-Friday.

The post office provides Monday-through-Saturday distribution of mail to resident students during the academic year.

### University Bookstore

Building 201 Matthews Administrative and Academic Complex  
Mail code Q-008  
534-3770

The University Bookstore makes available an extensive selection of books, including textbooks required for UCSD courses, supplementary reading materials, paperback books, technical reference books, medical books, and a wide variety of general-interest trade books. In addition, the bookstore carries a full line of sundries and gifts, including personal items, snacks, magazines and newspapers, clothing, posters, school supplies, electronic calculators, computers, software, art and engineering supplies, and medical instruments. Hours are 7:45 a.m. to 5:15 p.m., Monday through Friday; Saturday, 10:00 a.m. to 4:00 p.m., with special hours during rush periods in the first two weeks of every quarter.

### Check Cashing (Three Locations)

With proper identification, students may cash checks up to \$50 for a small charge at the Central Cashier's Office, Building 401 Matthews Administrative and Academic Complex, (Hours: Monday through Friday, 9:00 a.m.-3:00 p.m.), and the Central Box Office, Student Center (Hours: Monday through Friday, 10:00 a.m. to 2:00 p.m.).



With required identification, students may cash personal checks up to \$25 for a \$.25 charge at the University Bookstore, Building 201 Matthews Administrative and Academic Complex (Hours: Monday through Friday 7:45 a.m. to 5:15 p.m. and Saturday, 10:00 a.m. to 4:00 p.m.).

### University Police Department

Building 500 Matthews Administrative and Academic Complex  
Mail code Q-017  
EMERGENCY, DIAL 9-1-1  
Business, 534-4361

The UCSD Police Department provides continuous police coverage of the campus community, including a variety of service oriented law enforcement duties. Its primary purpose is to protect life and property. Patrol of the campus community and dispatching emergency services such as fire and ambulance, are provided twenty-four hours a day. The Police Department has a policy of providing reasonable enforcement of university regulations, local, state, and federal laws.

In addition, the housing and dormitory areas have campus security guards who provide on-site coverage during the nighttime hours.

### Crime Prevention Program

534-3644

The Police Department crime prevention program offers a variety of information to the campus community on crime prevention methods. Pamphlets, displays, and informative seminars are available.

### Community Service Officer Program

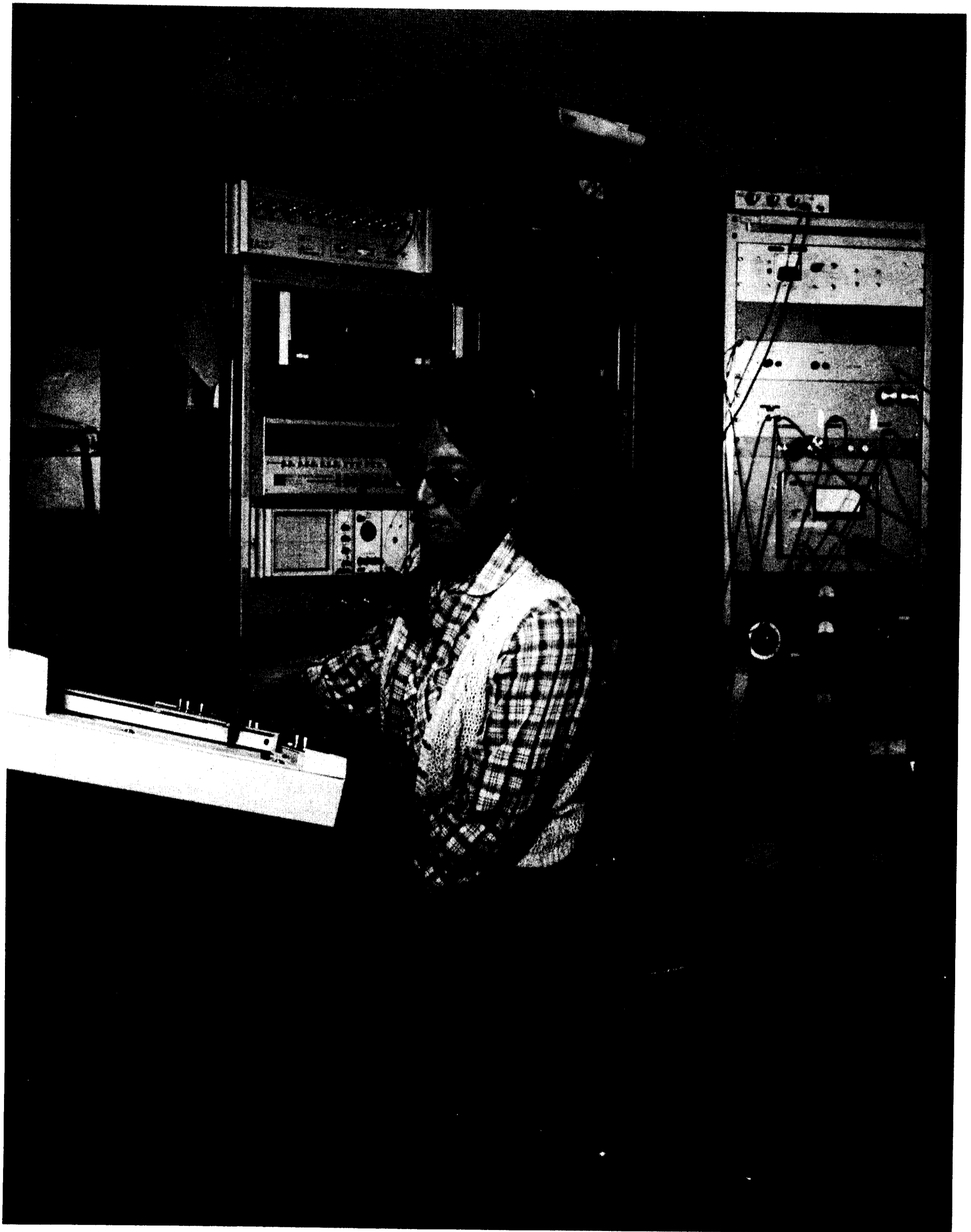
534-9255

CSO's are students who perform a variety of duties. The campus ESCORT service is perhaps the most popular and successful program. The ESCORT program is available during the evening hours.

### Lost and Found

534-4361

The Police Department serves as a central repository for lost and found articles. Any article found should be taken to the police station. The office is open twenty-four hours daily.



# RESEARCH AT UCSD

Members of organized research institutes and centers carry out advanced research projects often spanning the areas of knowledge encompassed by several academic departments and provide opportunities for graduate student support in broad disciplines. The study programs of graduate students supported by institutes and centers are administered by the academic departments in which the students are enrolled. The senior staff of these units are faculty members in related academic departments. Institutes and centers presently in operation at UCSD are described below.

In addition, the university is formally and informally affiliated with various private research organizations such as the Center for Study of Nonlinear Dynamics of the La Jolla Institute, the Institute of the Americas, the Salk Institute for Biological Studies, and the San Diego Supercomputer.

## UNIVERSITY-WIDE INSTITUTES/ORGANIZED RESEARCH UNITS

**California Space Institute (Cal Space)** was established in 1979 as a statewide organized research unit of the University of California. It conducts and supports space research, both pure and applied, with special emphasis on the opportunities created by space science and technology in the applied field. Specific areas of investigation include the following:

*Remote sensing* — the acquisition and processing of data on natural resources and the environment gathered by satellites or other automated devices with remote sensing instruments. Programs explore applications in oceanography, coastal studies, agriculture, forestry, and atmospheric pollution.

*Climate* — atmospheric physics and oceanography as applied to long- and medium-range weather and climate prediction, especially those aspects which utilize remote sensing data. Cal Space takes part with the Climate Group of ORD

in the Climate and Remote Sensing (CARS) research group.

*Space resources and human needs* — advanced technologies which can improve access to space. These include automation and robotics, innovative modes of propulsion, and use of extraterrestrial materials. Development of possible practical uses of special conditions in space of zero or controlled gravity, unlimited and uninterrupted solar heat, and vacuum.

*Minigrant program* — Cal Space supports a program of small grants to investigators on all UC campuses in space-related research, including the fields described above, astrophysics and space science.

**Institute of Geophysics and Planetary Physics (IGPP)** was established in 1960. Present research concentrates on the study of crustal dynamics by measurements of gravity, tilt, displacement, and strain; of regional seismicity and earthquake mechanisms; of the generation and variability of the geomagnetic field; of the spherical and aspherical structure of the earth by measurements of free oscillations and travel times; of linear and nonlinear fluid dynamics; of the variable mesoscale structure of the oceans by acoustic tomography; of the structure of the oceanic crust and lithosphere by seismic and electromagnetic measurements on the ocean bottom; and of tides, waves, turbulence, and circulation in the oceans. The institute operates a global array of broad band seismometers, the IDA (International Deployment of Accelerometers) Array; a crustal strain and seismic observatory at the Cecil and Ida Green Pinon Flat Observatory near Palm Springs, and a telemetered seismic array in the Anza, California, area. The institute does not grant degrees, but makes its facilities available to graduate students from various departments who have chosen to write their dissertations on geophysical problems. Members of the institute staff now hold joint appointments with the Departments of the Scripps Institution of Oceanography, Applied Mechanics and Engineering Sciences, and Physics.

**Institute on Global Conflict and Cooperation (IGCC)** is an interdisciplinary multicampus research unit promoting and conducting academic programs on all campuses of the University of California.

The focus of the institute's program is the study of international conflict situations sufficiently severe so as to threaten their escalation into large-scale war, especially but not exclusively nuclear war. This focus includes the causes of such conflicts as well as the ideas, institutions, policies, and mechanisms relevant for reducing and managing conflicts that might lead to global war. The mission of the institute is to enhance the capability of the university to contribute to international security and cooperation by stressing the kinds of activities which can best be carried out by a university. First and foremost, it is to make possible the exploration of ideas and the teaching of materials which are not now adequately represented in the university's programs.

Much of the work of the institute is in the form of individual projects supported by small grants made in response to proposals generated by a normal solicitation process. Some other IGCC activities are planned and initiated centrally (e.g., an annual Summer Teaching Seminar), but these, too, are carried out on whatever campus is most appropriate. The program is administered by a small central office staff located at the San Diego campus, consisting of a director, two assistant directors, a publications director, and two administrative assistants, who work with liaison officers on each of the other campuses. The program is advised by a Steering Committee made up of UC faculty and representatives of other California institutions.

**Institute of Marine Resources (IMR)**, established in 1954, is a university-wide organization with its headquarters and principal operating units at the UCSD Scripps Institution of Oceanography. An executive committee provides representa-



tion from each of the university's general campuses. The institute's mission is to enhance understanding of the marine environment and human interactions with it by carrying out research programs and stimulating interchange among the university's campuses.

Research and public service activities are carried out on the San Diego and Davis campuses and by marine advisers located in coastal cities. Current programs include research on marine products, ocean productivity, food science, ocean technology, and coastal engineering. As part of its intercampus activities IMR conducts workshops on specialized topics and provides support for graduate students in ocean-oriented fields to study temporarily on a campus other than their home campus.

A major function of the institute is the administration of the California Sea Grant College Program. This program supports the work of over fifty investigators on various campuses of the university and other academic institutions throughout the state, including traineeships for graduate students carrying out projects in all aspects of marine and coastal research.

Further information about the IMR intercampus study program and Sea Grant traineeships can be obtained from the IMR director's office.

**Intercampus Institute for Research at Particle Accelerators (IIRPA)** is an intercampus research unit established to facilitate the use of large national laboratory particle accelerator centers by individual University of California campuses. The principal activity at these particle accelerator centers is concerned with high-energy and elementary particle physics. Other disciplines are also finding more uses for the radiation from these accelerators, and hence the institute includes individuals engaged in biophysics research. There is at present no direct graduate program in the institute; however, graduate students in physics and biophysics can participate in the activity of the institute through their respective campus departments.

## CAMPUS-WIDE INSTITUTES

**Institute for Cognitive Science (ICS)**, established in 1981, encourages interdisciplinary research on fundamental principles and applications of cognition and intelligence.

The institute's laboratories and projects include the Educational Microcomputer UNIX Group, the Human-Machine Interface Project, the Parallel Distributed Processing Project, the Intelligent Systems Group, and the Cognitive Mechanisms Group. The institute provides administrative support for a number of the activities of its subunits. In addition, the institute serves as the research arm for the Ph.D. Program in Cognitive Science.

Research sponsored by the institute emphasizes interdisciplinary study of cognition. The active research program combines the efforts of psychologists, neuroscientists, and computer scientists in the study of human-machine interaction, parallel distributed processing, computational neurobiology, knowledge representation, intelligent graphical interfaces, and intelligent computer based instruction.

The **Institute for Nonlinear Science (INLS)** promotes interdisciplinary research and graduate education in the development and application of contemporary methods in the study of nonlinear dynamical systems. Using a common mathematical language, faculty and students from disciplines as diverse as cardiology, mathematics, oceanography, mechanical engineering, and economics pursue the implications of generic characteristics of nonlinear problems for their subjects. Each year the institute sponsors several long- and short-term senior visitors from the University of California and elsewhere and provides, through funds from external funding agencies, support for about twenty graduate students to work on Ph.D. dissertations concerned with nonlinear problems. Also associated with INLS are about ten postdoctoral fellows.

The core of INLS activities is composed of (1) joint research among faculty and students across disciplinary lines, (2) lecture series and working seminars designed to convey recent research progress and to stimulate new investigations. Through contracts with external agencies the INLS supports a major center in the experimental, numerical, and theoretical study of chaos and turbulence in fluid dynamics, investigations in nonlinear

polymer science, studies (jointly with the University of California, Berkeley) in the nonlinear stability of fluids and plasmas, investigations of mathematical properties of quasi-conformal mappings, and work on the bifurcation of symmetric systems.

The INLS at UCSD maintains close ties with similar activities at five other UC campuses and the Los Alamos National Laboratory. INLS supports exchanges of faculty and students among these campuses and the laboratory. In addition, the INLS participates in organizing a UC-wide annual conference and summer school in nonlinear science, as well as frequent intercampus workshops on various disciplinary topics in nonlinear dynamics. Student and faculty attendance at these events is supported by the INLS here at UCSD and the Office of the President of the university.

**Institute for Pure and Applied Physical Sciences (IPAPS)** is an interdisciplinary research unit which brings together members of the Departments of Applied Mechanics and Engineering Sciences, Physics, and Scripps Institution of Oceanography. The institute is concerned with hydrodynamics, molecular and solid-state physics, theory of fluids, catalysis, and numerical methods. Specific subjects of research include superconductivity, ferromagnetism, ferroelectricity, phase stability and melting points, plasma physics, hydromagnetics, high temperature gas dynamics, turbulence, fluid mechanics, nuclear structure and reactions, laser physics, atomic and molecular structure and reactions, and numerical analysis.

**Institute for Research on Aging (IRA)** encourages interdisciplinary research into a wide range of phenomena and changes in body function associated with aging. These range from a basic nature of the biological process of aging to the clinical disorders that occur in greater frequency with advanced age. Alzheimer's disease, as the principal cause of senile dementia, has been designated for highest priority research with special attention also to be given to arthritis, cardiovascular disease, and osteoporosis. The following program areas have been identified: immunology, arthritis and genetics; neurosciences; endocrinology and cell biology; atherosclerosis; clinical research; education (aging specific); psycho-socio aspects of aging; and human development and aging.



## CENTERS

The UCSD **Cancer Center (CC)** has been active since 1978 with the dual mission of enhancing basic and applied research focused on the broad area of neoplastic disease and also promoting the best available care for patients with cancer. Under the auspices of a Cancer Center Core Support Grant from the National Cancer Institute, there are five active program areas within the Cancer Center. These include Biostatistics, Cancer Biology, Pharmacology, Basic and Clinical Immunology, and Cancer Treatment, Clinical Trials Research, and Education. Shared resources at the Cancer Center include pharmacology, molecular biology and immunohistology core laboratories, a flow cytometry unit, a tissue bank and hybridoma production facility, a biostatistics unit, and a clinical trials office. Research and educational grants support the training of postdoctoral fellows and medical students. The Clinical Trials Office coordinates clinical research trials involving cancer patients at UCSD, and is the focal point for a large Cancer Protocol Outreach Network which provides state-of-the-art protocol treatment opportunities for patients in a broad geographic area around Southern California. Patient care activities of the Cancer Center are located in the Combined Oncology Clinic at the Theodore Gildred Cancer Facility and in the Inpatient Oncology Unit at UCSD Medical Center in Hillcrest. Basic research activities of the Cancer Center are carried out both at the Gildred Facility and at the 303 Matthews Administrative and Academic Complex building on the La Jolla campus. Members and associate members of the Cancer Center number in excess of 150 laboratory investigators and clinical physicians from ten academic departments. The overall operating budget of the Cancer Center, including contracts, grants, foundation awards, and individual gifts exceeds \$5.5 million a year.

**Center for Astrophysics and Space Sciences (CASS)** is an interdisciplinary research unit established in 1979. Research is conducted in the scientific areas of theoretical astrophysics; infrared, optical and ultraviolet astronomy; solar observational and theoretical studies; X-ray and gamma-ray astrophysics; solar, magnetospheric and space plasma physics; radio astronomy and cosmochemistry, includ-

ing the chemistry of interstellar matter. The center brings together academic and research staff from the Departments of Physics, Chemistry, and Electrical Engineering and Computer Sciences. CASS provides a jointly shared facility which has office, laboratory, and computer space to enhance the interchange of expertise.

The center's facilities, faculty, and research staff are available to graduate students in the Departments of Physics, Electrical Engineering and Computer Sciences, and Chemistry who have chosen to write their dissertation on subjects of research encompassed by CASS. Graduate and undergraduate courses in astrophysics, astronomy and space sciences are developed and taught by the academic staff of CASS.

The "Marlar Fellowship in Astrophysics and Space Sciences" is awarded to an outstanding senior graduate student in the area of astrophysics and space sciences.

The **Center for Energy and Combustion Research (CECR)**, in 1986, replaced and encompassed the **Energy Center**, which was formed in 1972-73 with initiation of graduate research programs and graduate and undergraduate courses on energy production, utilization, conservation, environmental impacts, and policy. Current research directions include energy research as well as combus-

tion science and evaluations of environmental impacts associated with fossil-fuel utilization. These interdisciplinary studies involve faculty members from several UCSD departments and SIO. A limited number of graduate research assistantships is available. Applications for graduate study in any of the disciplines covered by CECR should be directed to the chairperson of the academic department in which graduate study is to be undertaken.

**Center for Human Information Processing (CHIP)** provides facilities for visiting scholars and research. Associated laboratories undertake psychological and interdisciplinary projects in the areas of perception, psychophysics, cognitive development, psycholinguistics, attention, memory, detection theory, judgment and choice, information integration, and cognitive functions. The work of the center concentrates on theoretical and research projects, postdoctoral studies, workshops, conferences, and discussion groups.

**Center for Iberian and Latin American Studies (CILAS)** coordinates and promotes Latin American and Iberian research, teaching, and service activities for faculty and students in all departments at the university. It sponsors multidisciplinary colloquia, conferences, projects and publications, as well as library



expansion and outreach efforts. The center also hosts visiting faculty, films, and performances. It awards fellowships each year to the most promising graduate students. The U.S. Department of Education has designated CILAS, in consortium with the Latin American Center at San Diego State University, as a National Resource Center for Latin American Language and Area Studies.

The **Center for Magnetic Recording Research (CMRR)**, founded in 1983, is a national center devoted to multidisciplinary teaching and research in areas of science and engineering related to magnetic recording. As part of its mission to educate future leaders in this vital technology, the center, in cooperation with the Departments of Physics, Chemistry, Computer Science and Engineering, Electrical and Computer Engineering, and Applied Mechanics and Engineering Sciences offers classes at both the undergraduate and graduate levels in order to expose students to the concepts of magnetic recording and encourages graduate-level study. In addition, the center assists in the continuing education of professionals already in the field through workshops and seminars. CMRR also stimulates and supports research related to magnetic recording, especially the development of techniques to increase the storage capacity of magnetic recording devices.

**Center for Molecular Genetics (CMG)** promotes molecular genetic research and the training of graduate students and postdoctoral fellows in the biological and biomedical sciences. The latest techniques of gene isolation, gene manipulation, including the control of gene expression, and the genetic transformation of cells and organisms are both further developed and applied to major problems in biology and medicine. Current research and instructional programs are in the fields of developmental biology, human heredity, immunology, molecular neurobiology, plant molecular biology, and applied microbiology.

The center serves as a resource for the entire campus for molecular genetic techniques, materials and facilities, and encourages interactions with other organized research units in the biomedical area including the Cancer Center and the Institute for Research on Aging.

**Center for Music Experiment (CME)**, formed in 1971-72, is dedicated to the basic research in sound, music, and related areas. Funding has been provided by the Rockefeller Foundation, the National Endowment for the Arts, the System Development Foundation, Fund for the Improvement of Post-Secondary Education (FIPSE), and other private and public funding agencies.

The *Computer Audio Research Laboratory (CARL)* project supports research, production, and education in the application of computers to contemporary art music, including creation of computer-based instruments for music composition, performance and theory, application of such instruments to the identification of new knowledge about music, the creation of music itself, and the education of graduate music students.

The *Music Education Laboratory (MEL)* was established in 1985. A natural development of previous research into relationships between psychoacoustics and learning, current efforts are focused on the application of personal computers for educational exploration in music and sound. Structured environments or "microworlds" are being developed which with a few simple operations permit the construction of a rich and diverse set of musical or sonic structures.

*Colloquia* and periodic research seminars draw upon the expertise of UCSD faculty and distinguished visitors and scholars in this permanent forum of study which addresses the relationships among the diverse artistic disciplines, art and technology, and the arts and humanities.

The CME Archive has two functions: recording and archiving the activities and products of the center, and providing public access to these materials through the Central University Library and through the publication of scholarly papers and an annual report.

**Center for Research in Language (CRL)** is an independent unit of the Institute for Cognitive Science. The foci of the center are on processing models of language understanding, first and second language acquisition, and neurolinguistics. Research in the center is interdisciplinary and draws upon the fields of linguistics, psychology, neurosciences, computer science, sociology, and anthropology.

The center's facilities are designed to accommodate laboratory research projects by the faculty and graduate students;

facilities include a VAX 11/750 digital computer, extensive equipment for audio recording and analysis, and equipment for psycholinguistic experimentation.

Current research projects include: development of a neurally-inspired parallel processing model of speech perception; studies in first language acquisition; cross-linguistic comparisons of the process of language acquisition and aphasia; the psycholinguistic characterization of the process of acquisition of sign language by deaf children and of other gestural communication; a determination of the proper constituent structure representation(s) in VSO languages, and the compilation of a comparative dictionary of the Yuman languages. An ongoing speaker series presents a broad range of experimental approaches to the study of language.

**Center for United States-Mexican Studies (USMS)** serves as an international center for research, training, and public service activities concerning relations between Mexico and the United States. It deals with the full range of problems and issues affecting these relations (including immigration, trade, energy, foreign investment, technology transfer, environmental and cultural concerns, and public health problems). The center conducts original research, offers research and training fellowships for visiting scholars from Mexico and from other U.S. institutions, maintains a research library, sponsors public conferences and other public education activities, and publishes reports on current research bearing on U.S.-Mexican relations. It also offers a year-long seminar on U.S.-Mexican relations and Mexican development issues, and provides research assistantships and small research grants to graduate students and advanced undergraduates wishing to conduct independent research in this field.

The center is interdisciplinary in its concerns and approach, and invites the participation of scholars from all disciplines as well as nonacademic specialists from the public and private sectors in the U.S. and Mexico. It aims to serve as an integrating mechanism and informational clearinghouse for research undertaken at many different sites and as a vehicle for bringing scholars, citizens, and public officials together to examine the salient issues in U.S.-Mexican relations.

## LABORATORIES

The **Laboratory for Mathematics and Statistics (LMS)** promotes collaborative research in applied mathematics and statistics. Its members, most of whom belong to the Department of Mathematics, have carried out joint efforts with researchers of the UCSD Cancer Center, the Department of Applied Mechanics and Engineering Sciences, the Department of Biology, the Scripps Institution of Oceanography, the Pulmonary Program Project, the Specialized Center for Research on Ischemic Heart Disease, the UCSD Medical Center Regional Burn Center, and the Salk Institute. This research has involved the analysis of time series; the fitting of various models in cell kinetics, neurophysiology, pharmacokinetics, and pulmonary physiology; the study of gain equalization for amplifiers; the estimation of human risk from suspected environmental carcinogens; and computer aided diagnosis and prognosis in medicine.

## PROJECTS

The **Project for Humanistic Studies (PHS)** is the planning stage of a proposed Center for Humanistic Studies. The humanistic studies (i.e., the *sciences humaines* and the *Geisteswissenschaften*) will bring together UCSD faculty (and faculty from outside UCSD) from the arts, the humanities, and the social sciences. They will, when at the center, bring to completion (i.e., to the writing-up stage) substantive research projects and will also participate in an ongoing seminar in a selected topic in interpretation. Thus the problem of interpretation, as it is the central mode for understanding specifically human products, will be the integrating idea of the center.

The **Project in Geometry and Physics (PGP)**, to be established in 1987, will provide opportunities for increased collaboration between mathematics and physics.

The **Structural Systems Research Project (SSRP)** promotes research and graduate education in the development of contemporary methods for the design and analysis of large-scale civil, aerospace, geo- and ocean-based structures. The research team, which includes participants from the university and industrial institutions on a national basis, incorpo-

rates individuals with expertise in large-scale experimental testing, theoretical modeling, numerical algorithms and computer code development, interactive experimental techniques, data processing, limit state design, and optimal design.

The core of the project is the new Charles Lee Powell Structural Systems Laboratory. This facility is the largest structures laboratory in the United States. It features a fifty-foot high reaction strong wall for the testing of up to five-story full-scale buildings and other structural systems. When combined with an extensive closed loop-servo controlled hydraulic system and the new Cray-XMP supercomputer, which is hardlined to the facility, *interactive* experiments may be performed wherein actual dynamic environments are simulated. One such case involving the nonlinear response and damage evolution of a five-story structure to critical seismic excitations is currently in the development stage as part of a U.S.-Japan cooperative program in earthquake engineering. Research projects with CALTRANS on bridge rehabilitation and NSF on post-tensioned concrete girders are already in progress.

## NATURAL RESERVE SYSTEM (NRS)

The **Natural Reserve System (NRS)** was founded to establish and maintain a system of natural undisturbed land and water areas as samples of the diversity of California's terrain. These reserves are used to promote teaching and research in the environmental sciences. Faculty and students of the University of California and other institutions are encouraged to use any of the twenty-six reserves in the system for serious academic pursuits. Further inquiries can be directed to Dr. Paul Dayton, chairman of the UCSD NRS advisory committee, or to Ms. Melinda Pruett-Jones, Reserve Coordinator, 534-2077. The San Diego campus administers the following five reserves:

**Dawson Los Monos Canyon Reserve:** This 144-acre reserve is located on the outskirts of the town of Vista in north coastal San Diego County. Its young, stream-cut valley contains a year-round creek with precipitous north- and south-facing slopes. The major habitat types are Southern California Riparian Woodland, Coastal Sage Scrub, and South Coastal Mixed Chaparral. There are also some archaeological values here.

**Elliott Chaparral Reserve:** Located a short distance off campus, this 107-acre reserve features Chamise Chaparral and related Chaparral species typical of coastal San Diego County. It is readily available during a normal three-hour lab period or for term-paper-length field studies as well as for more lengthy projects.

**Kendall-Frost Mission Bay Marsh Reserve:** This twenty-acre reserve is the last tidal salt marsh on Mission Bay and one of the few remaining in Southern California. It provides habitat for two rare birds, the light-footed flapper rail and the Belding's Savannah Sparrow. There are limited laboratory facilities available on the site. It is within short driving distance of campus.

**Ryan Oak Glen Reserve:** This fifteen-acre reserve is located on the outskirts of the city of Escondido. Numerous seeps and springs in an otherwise dry region of Coastal Sage Scrub and Chamise Chaparral support unusually rich flora and fauna for this region. There is a small grove of Englemann Oak. There are no facilities on this reserve, but it is easily available during one-day field trips.

**Scripps Shoreline-Underwater Reserve:** This reserve is located along the shoreline north of the Scripps Pier and features Protected Sandy Beach, Protected Rocky Shore, and Southern Coastal Bluff Scrub. Scientific use of the sixty-seven acres offshore has been granted to the university by the state legislature providing opportunities for marine studies as well as terrestrial studies on the bluffs and beach. This reserve is enhanced by the availability of the laboratories and facilities of nearby Scripps Institution of Oceanography and the main San Diego campus.

## CAMPUS-WIDE RESEARCH FACILITIES

### Academic Computing Center

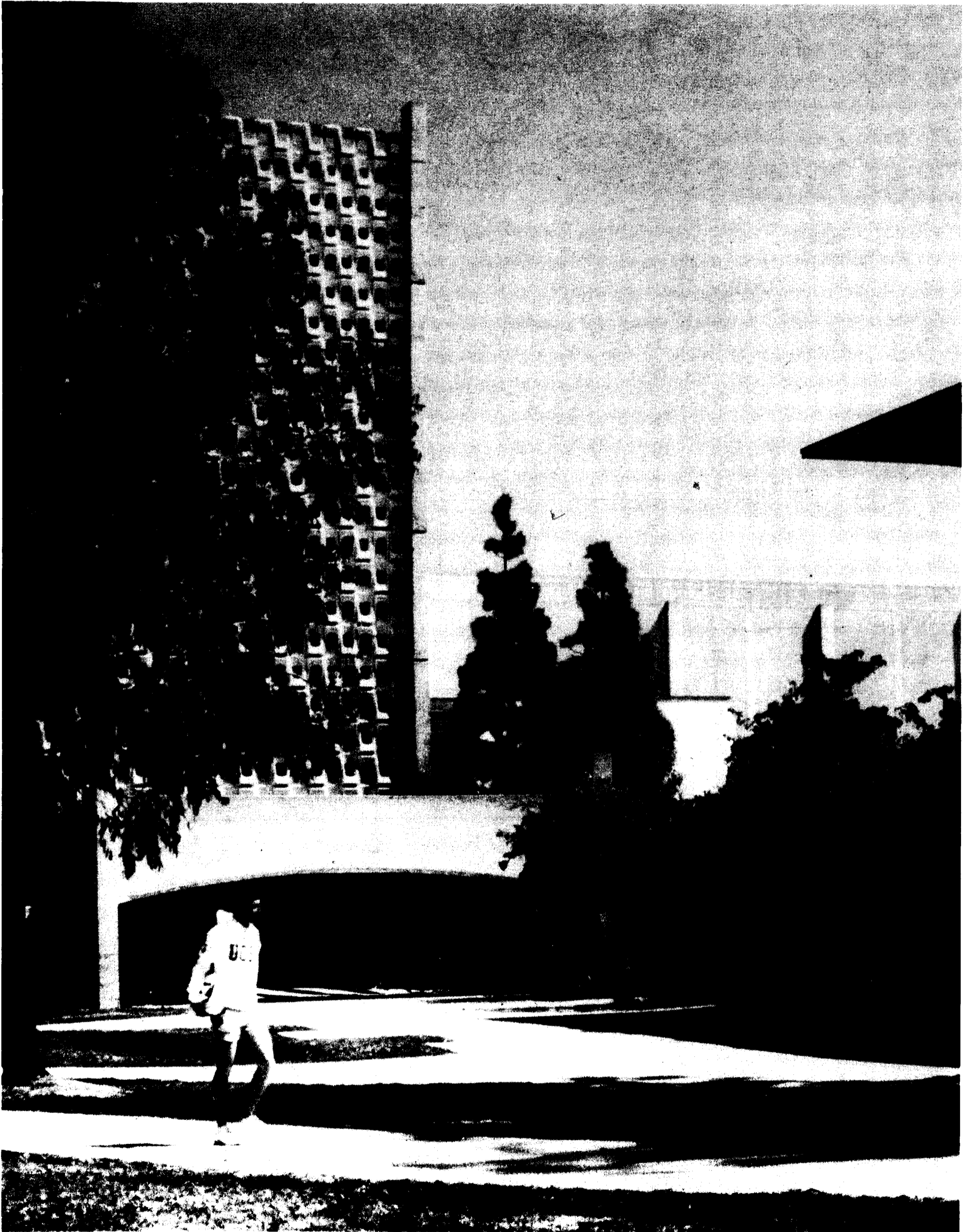
See page 101

### San Diego Supercomputer

See page 104

### The University Library

See page 106





# THE SCHOOL OF MEDICINE

The School of Medicine's unique interdisciplinary approach to medical education enables students to benefit from a diversity of laboratory facilities, clinical opportunities, and faculty talent and knowledge. Because the School of Medicine and the UCSD general campuses are developing simultaneously, a close interdisciplinary cooperation has developed. Teaching and research, therefore, are well integrated on this campus. The medical school faculty includes scientists from the campus Departments of Applied Mechanics and Engineering Sciences, Biology, Chemistry, Mathematics, Sociology, and the Scripps Institution of Oceanography. The medical school curriculum is broadened by the contributions of these faculty members, who create special courses emphasizing the facets of their disciplines which closely relate to medical education. Another feature of the School of Medicine's curriculum is its emphasis on the human being as an inextricable part of the social milieu. All instruction in medicine and related sciences considers humans not merely as physical organisms, but as complex beings who exist in a complex physical, social, and psychological environment.

The settings for clinical instruction and experience comprise a variety of hospitals and clinics ranging from rural, outlying facilities and county urban centers to the UCSD Medical Center. These affiliated hospitals and clinics include the 409-bed University Hospital and a variety of outpatient clinics; the 577-bed Veterans Administration Medical Center adjacent to the La Jolla campus; the 583-bed Naval Hospital, which is the largest military medical complex in the United States, and eight other affiliated medical facilities. Two additional major facilities were completed in 1978: a clinical teaching facility located at the UCSD Medical Center, and a medical teaching facility adjacent to the Basic Science Building.

The goal of the medical curriculum clinical experience and faculty-student interactions is to develop individual, objective, and conscientious physicians

prepared for the changing conditions of medical practice and continuing self-education. Students acquire understanding of the basic medical sciences and clinical disciplines, and are encouraged to choose their own specialized areas of interest for eventual development into careers in the broadly diversified medical community. All students have access to the best facilities and personalized counseling. The curriculum provides flexibility; form and content are adapted to the individual needs and goals of each student.

The curriculum is divided into two major components: the core curriculum and the elective programs. Elective opportunities comprise nearly one-fourth of classes during the first two years, and more than one-third during the last two years. The core curriculum includes those aspects of medical education deemed essential for every medical student regardless of background or ultimate career direction. The integrated core curriculum of the first two years is designed to provide each entering student an essential understanding of the fundamental disciplines underlying modern medicine. The core curriculum of the last two years is composed of the major clinical specialties taught in hospital settings, outpatient situations, and relevant extended-care facilities. A Medical Scientist Training Program provides the opportunity for a limited number of students to earn both the M.D. and Ph.D. degree over a six- to seven-year period of study.

Each student is expected to develop an individualized program of independent study, in conjunction with a faculty member, and describe it in writing. Effective with the class entering in fall quarter 1986, students will be graded on an Honors/Pass/Fail system for required courses. The Honors grade will not be used to numerically rank the class, but will be used to acknowledge students who have demonstrated superior academic performance. Elective courses will be graded on a Pass/Fail system. Students will receive individual evaluations by the faculty.

The School of Medicine enrolled its charter class of undergraduate medical

students in September 1968. Freshman student enrollment is 122 and a total of 501 medical students were enrolled in 1986.

## Selection Factors

Selection is based upon the nature and depth of scholarly and extracurricular activities undertaken, academic record, performance on the MCAT, letters of recommendation, and personal interviews.

The Admissions Committee gives serious consideration only to those applicants with a GPA greater than 3.0 and above average scores on the MCAT. The School of Medicine is actively recruiting students from disadvantaged backgrounds who have shown determination to pursue careers in medicine and who have demonstrated personal promise for becoming dedicated physicians.

A complete catalog and information on the foregoing programs are available upon request.

Write or call:

The Office of Admissions  
School of Medicine, M-021  
University of California,  
San Diego  
La Jolla, California 92093  
(619) 534-3880

## Programs for Prospective Medical Students

UCSD offers no special premedical major. An undergraduate student considering medicine as a career may choose any major or concentration area leading to the bachelor's degree, provided that he or she elects those additional courses which the medical school of his or her choice may require for admission. Admission requirements differ among medical schools, but most desire a solid foundation in the natural sciences — biology, chemistry, physics, mathematics — and a broad background in the humanities, social sciences, and communication skills. A premedical/dental advisory program is available through the campus-wide Career Services Center.





# SCRIPPS INSTITUTION OF OCEANOGRAPHY

Scripps Institution of Oceanography is one of the oldest, largest, and most important centers for marine science research, graduate training, and public service in the world. Its preeminence in the marine sciences is reflective of its excellent programs, distinguished faculty, and outstanding facilities.

In all, Scripps occupies sixty-five buildings on 230 acres along the Pacific coastline below the mesa on which UCSD is located. Its staff numbers approximately 1,200, including approximately 190 graduate students. The institution's budget is approximately \$60 million annually.

Scripps Institution was founded in 1903 as an independent biological research laboratory, which became an integral part of the University of California in 1912. At that time the laboratory was given the Scripps name in recognition of Ellen Browning Scripps and E. W. Scripps.

Research at Scripps encompasses physical, chemical, biological, geological, and geophysical studies of the oceans. Ongoing investigations include the topography and composition of the ocean bottom, waves and currents, and the flow and interchange of matter between seawater and the ocean bottom or the atmosphere. Scripps's research ships are used in these investigations throughout the world's oceans. Among the more than 250 programs that may be under way at any one time are studies of the climate, energy from the sea, earthquake prediction, the formation of manganese nodules on the deep-ocean floor, erosion of beaches, the effects of pollution on the marine food chain, and the geology of the ocean basins.

Scripps operates four ships and two platforms for oceanographic research primarily in support of programs by Scripps researchers, although a significant part of their work is for oceanographers from other institutions throughout the world. Cruises range from local, limited-objective trips to far-reaching expeditions in the world's oceans.

Investigations supported by contracts and grants, primarily federal, cover a wide latitude of marine research. The general research effort is conducted by three divisions: Marine Biology Research Division, Geological Research Division, and Ocean Research Division, which includes the Physical and Chemical Oceanographic Data Facility, the Climate Research Group, and the Satellite-Oceanography Facility. The diversity of Scripps's work is extended by three special purpose laboratories: the Marine Physical Laboratory, the Physiological Research Laboratory, and the Visibility Laboratory. Other specialized groups also are located on campus: the Center for Coastal Studies and the Marine Life Research Group. A ship operations and marine technical support unit provides essential services and facilities to all research units of the institution.

Scripps's educational program has grown hand in hand with the research programs. Instruction is on the graduate level, and students are admitted as candidates for the Ph.D. degree. Academic work is conducted through an organizational segment of the institution known as the Graduate Department of SIO and its seven curricular groups: biological oceanography, physical oceanography, marine biology, geological sciences, marine chemistry, geophysics, and applied ocean sciences. Approximately eighty professors are complemented by an academic staff of more than 100 research scientists, many of whom have a regularly scheduled role in the instructional program.

The Scripps Aquarium-Museum provides a wide variety of educational courses in the marine sciences for students from primary grades to high school level. UCSD students also may become involved in work-study programs, or serve as volunteers or aquarist trainees. A limited number of students can be accommodated for a four-unit course in independent study by arrangement with a faculty member and the aquarium-museum director. The facility's resources include natural habitat groupings of marine life

from local and Gulf of California waters, many of which are on display in the aquarium. The museum exhibits present basic oceanographic concepts and explain research undertaken at Scripps. The aquarium-museum is open from 9:00 a.m. to 5:00 p.m. daily, without charge. A new aquarium and ocean science interpretive center is scheduled to open in 1990.

The La Jolla Laboratory of the University of California's Institute of Geophysics and Planetary Physics, UC's California Space Institute, and UC's Institute of Marine Resources (IMR), although organizationally separate, are closely affiliated with Scripps. In addition to its regular research programs, IMR administers the California Sea Grant College Program, with more than fifty projects and approximately fifty trainees supported on California campuses, and several specialized research units, including the Food Chain Research Group and the Ocean Engineering Research Group. The Southwest Fisheries Center (SWFC), located near the Scripps campus, is one of thirty major laboratories and centers operated by the National Marine Fisheries Service, a component of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. Also, SWFC is the headquarters for the Inter-American Tropical Tuna Commission.

Students enter oceanography with extremely varied interests and backgrounds — naturalists, explorers, engineers, and theorists from the United States and from many foreign countries. One thing they have in common, however, is that they come to Scripps with a very strong understanding of science. Most students select positions as research assistants when they enter the program, which not only gives them an early involvement with research, but also provides salaries. The student-faculty ratio at Scripps is about two-to-one, which means classes are small, and the student has the

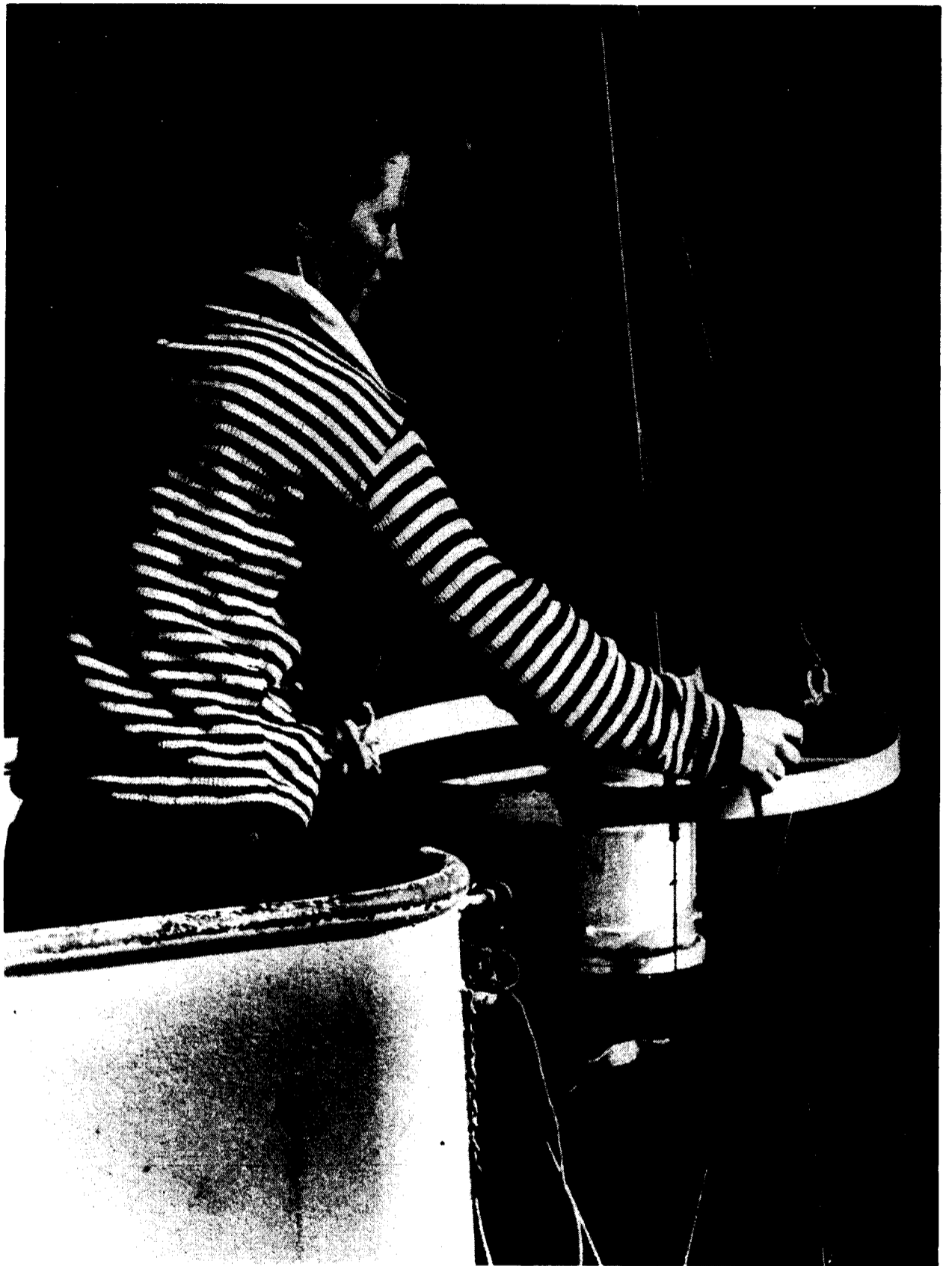
opportunity to work closely with his or her thesis adviser. Oceanography is an interdisciplinary field, which allows for informal exchange and interaction on a variety of levels.

While at Scripps, students have for their use some of the nation's most sophisticated and complete special laboratories and facilities for oceanographic studies covering a wide range of disciplines from biology and physiology to geophysics and atmospheric sciences. A hydraulics laboratory features a unique ninety-foot stratified wave-and-current channel, and an analytical facility has a host of scanning electron microscopes and other high-precision instruments. The Satellite-Oceanography Facility enables researchers to receive and process satellite imagery from earth-orbiting satellites. The Scripps Library is the University of California's major collection of marine science materials, with outstanding collections in oceanography, marine biology, and marine technology. It also specializes in atmospheric sciences, fisheries, geology, geophysics, and zoology. The various marine life and geological specimens housed at Scripps form a vast "library" of oceanographic resources available for investigations. During a student's tenure at Scripps, he or she will have the opportunity to go to sea on any of Scripps's four research vessels, as well as those from other oceanographic institutions.

The combination of the large scientific staff and extensive facilities at Scripps provides an extraordinary opportunity for each student to enjoy close contact with existing oceanographic concepts and active participation in research.

See "Scripps Institution of Oceanography" in "Courses, Curricula, and Programs of Instruction" for further details on study programs, requirements, degrees, and courses. For additional information, write:

Graduate Student Information  
Scripps Institution of  
Oceanography  
1166 Ritter Hall, A-008  
University of California,  
San Diego  
La Jolla, California 92093



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# INTERNATIONAL RELATIONS AND PACIFIC STUDIES GRADUATE SCHOOL

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The Graduate School of International Relations and Pacific Studies (IR/PS) at the University of California, San Diego is an exciting new venture in higher education. The Pacific region shapes our lives and influences decisions made by business managers and government officials. IR/PS has been established to help create professionals who can act effectively in this international arena.

Established in January 1986, the school is the only professional school of international relations in the University of California system and one of only three such schools in the American West. The school has three objectives: 1) training for professional careers; 2) research on the Pacific region; 3) public outreach.

1) The degree programs of the school will provide professional training for careers in international affairs concerning the Pacific region. These careers range across the private sector, the public sector and non-profit organizations. They include jobs in industry, government, international organizations, the news media, foundations, schools, and research institutes. Whatever their career goals, students will be expected to develop a broad training across professional areas, so that those headed for the government have a grasp of decisions in the private sector, and those planning business careers acquire a grasp of decision making in public organizations. A program combining applied social science and professional subjects with courses on Pacific region countries will provide students with both general skills and particular knowledge of the history, culture, language, and contemporary situations in Latin America or Asia.

2) The school will serve as a major center for research on issues of common concern to the nations of the Pacific region. IR/PS is distinctive in its concentration on the Pacific region. Since the Pacific Basin has become an important focus of U.S. economic and security relations, the need for information and research centered on that dynamic region has become urgent. The diversity of

national experiences represented by the countries of Asia and Latin America suggests a research agenda for the school which includes comparisons of different approaches to economic management, foreign relations, policy making, and development.

3) As a component of the University of California, the school has a role to play in developing public awareness and understanding of the Pacific region. Programs of public outreach contribute to the information available to citizens and specialized groups about international issues that affect their lives.

## The Study of International Affairs

International affairs programs will be developed in response to the increasing participation of the United States in global economic and political affairs. The early programs were devoted to the preparation of students for careers in diplomacy, primarily with the United States Department of State. Since European affairs were at the top of the American foreign policy agenda, the early programs concentrated on European studies and emphasized history and the study of institutions in their research and curricula.

The next phase on international affairs as a program of study resulted from expanding American involvement in the developing countries and the spread of United States-based multinational enterprises. With a growing need for individuals who had knowledge of particular parts of the world, international affairs programs tended to produce area specialists with expertise in one region or country. Programs combined social sciences with history, literature, and other cultural disciplines. One consequence of the vigorous growth of area studies programs during this phase was a fragmentation of specializations and of international affairs as a field of study.

The present phase of the field's development builds on, yet differs from, previous development in both training, geographical emphasis, and curriculum. The United States wields less economic and

political influence than it did in the immediate postwar years; at the same time, American industries face increasing competitive pressures in domestic and international markets. As a result, professionals who can understand and work in an internationalized environment are needed in both the public and private sectors: in government agencies, private banks and firms, non-profit organizations, and the media. Moreover, while the United States once looked to Europe as the site of its major commercial, financial, and strategic interests, the United States now has large stakes in the Pacific Basin, a likely source of both our greatest national challenges and opportunities in the next decades. Finally, international affairs curricula have begun to give increasing attention to finding ways of linking social science insights with the training required of professionals in international affairs.

These changes create both a need and an opportunity: a need for new programs of training and research in international affairs; and an opportunity for a new school of international affairs to develop a distinctive, modern program that links professional training with international competence, that gives greater prominence to the Pacific Basin, and that develops professional skills in the context of applied social science.

The school emphasizes the Pacific region as a distinctive area in the international system. It runs from the southernmost tip of Latin America northward, across the United States and Canada, down through the USSR, Japan, China, Korea, the Philippines, Australia, New Zealand, the other nations of East and Southeast Asia, and the many island nations of Oceania (Polynesia, Melanesia, and Micronesia).

In its first development phases, the school will focus on certain countries and regions, namely Japan, China, and Latin America. As soon as possible the school will develop expertise in Southeast Asia, Korea, the Soviet Union, and other Asian countries.

## The Master's and Ph.D. Degrees

In its first phase, the school plans to offer two degree programs: a professional master's degree and a doctoral degree. In the fall of 1987 the first group of students will begin the program for the master's degree in Pacific international affairs (MPIA). The first Ph.D. candidates will be admitted in the fall of 1988. The proposal for these degree programs is currently under administrative review by the University of California. In the next phase, the school will develop mid-career and other intensive short programs.

The MPIA program is distinctive in several respects. The program:

- exposes students to the perspectives of both private business and public policy making;
- offers specialized training in economics, management, international relations, and political analysis and integrates the languages, history, and cultures of the Pacific region into the curriculum;
- creates a laboratory for comparative analysis of economic management, foreign relations, policy making, and development in the diverse countries of the Pacific region.

Ph.D. students are expected to develop a program of study that assures competence in their major field, in their minor field, and in the comparative analysis of Pacific region issues:

- in the major field, students must acquire superior knowledge of the literature of that field and develop the research skills needed to do advanced work in their dissertation;
- in the minor field, students must acquire substantial knowledge of the literature of that field and develop some ability to bring that knowledge to bear in research activities;
- students must further develop substantial ability to analyze comparatively the policy issues of the Pacific region and to understand the historical and cultural roots of these issues.

The master's and Ph.D. programs are distinct and separate. There is little overlap in the structure or requirements of the two programs because their objectives are very different. The master's program provides professional training for graduates who will pursue international careers in business, government, journalism, and other organizations. The Ph.D. program offers an interdisciplinary academic education to a small number of students who will pursue international careers requiring advanced research capabilities in universities, corporations, government agencies, consulting firms, or other research organizations.

The master's and Ph.D. programs do share a common intellectual framework. Both the professional master's curriculum and the academic Ph.D. curriculum are designed to bring the theories, methods, and insights of various disciplines together to analyze policy issues of the Pacific region and to blend the perspectives of public policy-makers and private managers. The same faculty will teach and advise students in both the master's and Ph.D. programs. And some IR/PS courses will serve both master's and Ph.D. students although Ph.D. students will usually be required to do additional research and writing in the courses.

MPIA students who decide to transfer to the Ph.D. program will find that the courses they have taken in the master's program, although not designed for advanced research-oriented Ph.D. training, will be useful and contribute to their progress in the Ph.D. program. There are no formal course requirements for the major and minor fields in the Ph.D. program; therefore there is no issue of formal course credit for courses already taken in the master's program. However, because the knowledge that MPIA students have acquired in these master's courses will aid them in preparing for their Ph.D. comprehensive examinations, the MPIA students can expect to reach this point in the Ph.D. program in less than the usual two years.

## The Faculty

The school has attracted an interdisciplinary faculty from such fields as economics, management sciences, international relations, comparative politics, and public policy. The program draws upon and contributes to research which focuses on the regions of the Pacific Basin and on major issues that affect the region.

The school places special emphasis on

research and pedagogy in areas of particular importance to the program. These topics currently include:

(a) the Pacific Basin as system, including the interaction of the countries and regions within it (e.g., Latin American-Japanese economic relations, U.S. relations with both East Asia and Latin America), and the placement of the Pacific in the global system of international relations, both contemporary and historical.

(b) studies in international economics, management, and finance, including such subject areas as international competition, comparative industrial organization, international trade and development, industrial relations, technological innovation, international financial structures, policies, institutions, and historical patterns of development.

(c) comparison of the trajectories of socio-economic development among the countries of Asia and Latin America, including exploration of differences and similarities in state-society relations, culture, entrepreneurship, linkage to the global economy, and geopolitical position.

(d) expression, analysis, and uses of culture and religion, within countries of the Pacific Basin and exploration of problems in communicating across cultures, including the development of innovative pedagogy for these tasks, making use of the performing arts and cultural artifacts and drawing on cultural anthropology, social linguistics, and other related disciplines in the humanities and social sciences.

(e) comparative analysis of patterns of policy making in the countries of the Pacific region to understand how different governmental structures, economic systems, and social group interests shape the policy process and influence policy choices in such areas as budget allocations, regulation of industry, and foreign trade.

For additional information on the school see the section on International Relations and Pacific Studies Graduate School later in the catalog.

# UCSD FACULTY MEMBERS

| NAME                                | TITLE                  | DEPARTMENT                 | COLLEGE     |
|-------------------------------------|------------------------|----------------------------|-------------|
| <b>Abarbanel, Henry D. I.</b>       | Professor-in-Residence | Physics                    | Revelle     |
| <b>Abramson, Ian S.</b>             | Assistant Professor    | Mathematics                | Muir        |
| <b>Addison, Michael C.</b>          | Professor              | Theatre                    | Warren      |
| <b>Agler, Jim</b>                   | Associate Professor    | Mathematics                | Muir        |
| <b>Alfven, Hannes</b>               | Professor Emeritus     | ECE                        | Muir        |
| <b>Allison, Henry E.</b>            | Professor              | Philosophy                 | Revelle     |
| <b>Allison, William S.</b>          | Professor              | Chemistry                  | SchMed      |
| <b>Anagnostopoulos, Georgios H.</b> | Associate Professor    | Philosophy                 | Warren      |
| <b>Anderson, Donald W.</b>          | Professor              | Mathematics                | Muir        |
| <b>Anderson, Norman H.</b>          | Professor              | Psychology                 | Muir        |
| <b>Anderson, Victor C.</b>          | Professor              | ECE                        | SIO/Muir    |
| <b>Antin, David A.</b>              | Professor              | Visual Arts                | Muir        |
| <b>Antin, Eleanor</b>               | Professor              | Visual Arts                | Muir        |
| <b>Aref, Hassan</b>                 | Associate Professor    | AMES/IGPP                  | Warren/SIO  |
| <b>Armi, Laurence</b>               | Associate Professor    | SIO                        | SIO         |
| <b>Arneson, Richard J.</b>          | Associate Professor    | Philosophy                 | Third       |
| <b>Arnold, James R.</b>             | Professor              | Chemistry                  | Revelle     |
| <b>Arrhenius, Gustaf</b>            | Professor              | SIO                        | SIO         |
| <b>Arthur, Robert S.</b>            | Professor Emeritus     | SIO                        | SIO         |
| <b>Atkinson, Richard C.</b>         | Professor/Chancellor   | Psychology                 | Third       |
| <b>Attiyeh, Richard E.</b>          | Professor/Dean         | Economics/Graduate Studies | Revelle     |
| <b>Backus, George E.</b>            | Professor              | SIO/IGPP                   | SIO         |
| <b>Bada, Jeffrey L.</b>             | Professor              | SIO                        | SIO/Revelle |
| <b>Bailey, Frederick G.</b>         | Professor              | Anthropology               | Muir        |
| <b>Balzano, Gerald J.</b>           | Associate Professor    | Music                      | Muir        |
| <b>Bank, Randolph E.</b>            | Professor              | Mathematics                | Warren      |
| <b>Bates, Elizabeth A.</b>          | Professor              | Psychology                 | Third       |
| <b>Bear, Donald V. T.</b>           | Professor              | Economics                  | Revelle     |
| <b>Beck, Nathaniel L.</b>           | Associate Professor    | Political Science          | Warren      |
| <b>Behar, Jack</b>                  | Associate Professor    | Literature                 | Revelle     |
| <b>Belew, Richard K.</b>            | Assistant Professor    | CSE                        | Third       |
| <b>Bender, Edward A.</b>            | Professor              | Mathematics                | Muir        |
| <b>Benson, Andrew A.</b>            | Professor              | SIO                        | SIO         |
| <b>Berg, Darwin K.</b>              | Professor              | Biology                    | Warren      |
| <b>Berger, Bennett M.</b>           | Professor              | Sociology                  | Muir        |
| <b>Berger, Wolfgang H.</b>          | Professor              | SIO                        | SIO         |
| <b>Berkowitz, Ami E.</b>            | Professor              | Physics                    | Warren      |
| <b>Berman, Francine D.</b>          | Associate Professor    | CSE                        | Revelle     |
| <b>Berman, Ronald S.</b>            | Professor              | Literature                 | Muir        |
| <b>Bertram, H. Neal</b>             | Professor              | ECE                        | Revelle     |
| <b>Blanco, Carlos</b>               | Professor              | Literature                 | Third       |
| <b>Blumberg, Rae L.</b>             | Associate Professor    | Sociology                  | Third       |

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|---------------------------------|-----------------------------|-----------------------------|-------------|
| <b>Bond, F. Thomas</b>          | Associate Professor/Provost | Chemistry/Revelle           | Revelle     |
| <b>Booker, Henry G.</b>         | Professor Emeritus          | ECE                         | Muir        |
| <b>Bowles, Kenneth L.</b>       | Professor Emeritus          | CSE                         | Muir        |
| <b>Boynton, Robert M.</b>       | Professor                   | Psychology                  | Muir        |
| <b>Bradbury, Jack W.</b>        | Professor                   | Biology                     | Muir        |
| <b>Bradley, Laurette</b>        | Assistant Professor         | CSE                         | Muir        |
| <b>Bradner, Hugh</b>            | Professor Emeritus          | AMES/IGPP                   | Revelle/SIO |
| <b>Brian, Adrienne A.</b>       | Assistant Professor         | Chemistry                   | Warren      |
| <b>Brody, Stuart</b>            | Professor                   | Biology                     | Muir        |
| <b>Brown, Willie C.</b>         | Associate Professor         | Biology                     | Third       |
| <b>Brueckner, Keith A.</b>      | Professor                   | Physics                     | Revelle     |
| <b>Brune, James N.</b>          | Professor                   | SIO                         | SIO         |
| <b>Bullock, Theodore H.</b>     | Professor Emeritus          | Neurosciences               | SchMed/SIO  |
| <b>Bunch, James R.</b>          | Professor                   | Mathematics                 | Warren      |
| <b>Burbidge, E. Margaret</b>    | University Professor        | Physics                     | Revelle     |
| <b>Burbidge, Geoffrey R.</b>    | Professor Emeritus          | Physics                     | Revelle     |
| <b>Burkhard, Walter A.</b>      | Professor                   | CSE                         | Warren      |
| <b>Cancel, Robert</b>           | Assistant Professor         | Literature                  | Third       |
| <b>Carpenter, Adelaide T.</b>   | Professor                   | Biology                     | Warren      |
| <b>Carson, Richard T.</b>       | Assistant Professor         | Economics                   | Warren      |
| <b>Casalduero, Joaquin</b>      | Professor Emeritus          | Literature                  | Revelle     |
| <b>Case, Ted J.</b>             | Professor                   | Biology                     | Revelle     |
| <b>Cassedy, Steven D.</b>       | Associate Professor         | Literature                  | Warren      |
| <b>Catalan, Diego</b>           | Professor                   | Literature                  | Revelle     |
| <b>Cespedes, Guillermo</b>      | Professor Emeritus          | History                     | Revelle     |
| <b>Chang, William S. C.</b>     | Professor                   | ECE                         | Warren      |
| <b>Charrad-Brenner, Mounira</b> | Assistant Professor         | Sociology                   | Muir        |
| <b>Chau, Pao C.</b>             | Assistant Professor         | AMES                        | Revelle     |
| <b>Cheatham, James R.</b>       | Sr. Lecturer (SOE)          | Music                       | Third       |
| <b>Chen, Joseph C. Y.</b>       | Professor                   | Physics                     | Revelle     |
| <b>Chen, Matthew Y. C.</b>      | Professor                   | Linguistics                 | Muir        |
| <b>Cheng, Chung-Kuan</b>        | Assistant Professor         | CSE                         | Muir        |
| <b>Chodorow, Stanley A.</b>     | Professor/Dean              | History/Arts and Humanities | Revelle     |
| <b>Chrispeels, Maarten J.</b>   | Professor                   | Biology                     | Muir        |
| <b>Christmas, Eric C.</b>       | Professor Emeritus          | Theatre                     | Muir        |
| <b>Chung, Sandra L.</b>         | Professor                   | Linguistics                 | Third       |
| <b>Churchland, Patricia S.</b>  | Professor                   | Philosophy                  | Muir        |
| <b>Churchland, Paul M.</b>      | Professor                   | Philosophy                  | Warren      |
| <b>Cicerone, Carol M.</b>       | Associate Professor         | Psychology                  | Muir        |
| <b>Cicourel, Aaron V.</b>       | Professor                   | Sociology                   | SchMed      |
| <b>Clark, Leigh B.</b>          | Associate Professor         | Chemistry                   | Revelle     |
| <b>Cohen, Alain J. J.</b>       | Associate Professor         | Literature                  | Muir        |
| <b>Cohen, Harold</b>            | Professor                   | Visual Arts                 | Muir        |
| <b>Cole, Michael</b>            | Professor                   | Communication               | Third       |
| <b>Coles, William A.</b>        | Professor                   | ECE                         | Muir        |
| <b>Comisso, Ellen T.</b>        | Associate Professor         | Political Science           | Warren      |
| <b>Concha, Jaime</b>            | Professor                   | Literature                  | Muir        |
| <b>Conlisk, John</b>            | Professor                   | Economics                   | Revelle     |
| <b>Cooper, Charles R.</b>       | Professor                   | Literature                  | Third       |
| <b>Cornelius, Wayne A.</b>      | Professor                   | Political Science           | Warren      |



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|-----------------------------------|---------------------|-------------------|----------------|
| <b>Corrigan, Mary K.</b>          | Associate Professor | Theatre           | Warren         |
| <b>Cowhey, Peter F.</b>           | Associate Professor | Political Science | Warren         |
| <b>Cox, Charles S.</b>            | Professor           | SIO               | SIO            |
| <b>Cox, Gary W.</b>               | Associate Professor | Political Science | Muir           |
| <b>Cox, Stephen D.</b>            | Associate Professor | Literature        | Revelle        |
| <b>Craig, Ann L.</b>              | Assistant Professor | Political Science | Muir           |
| <b>Craig, Harmon</b>              | Professor           | SIO               | Revelle/SIO    |
| <b>Crawford, Vincent P.</b>       | Professor           | Economics         | Warren         |
| <b>Crowell, John E.</b>           | Assistant Professor | Chemistry         | Revelle        |
| <b>Crowne, David K.</b>           | Associate Professor | Literature        | Revelle        |
| <b>Curray, Joseph R.</b>          | Professor           | SIO               | SIO            |
| <b>D'Andrade, Roy G.</b>          | Professor           | Anthropology      | Warren         |
| <b>Dashen, Roger F.</b>           | Professor           | Physics           | Muir           |
| <b>Dau, Paolo M.</b>              | Assistant Professor | Philosophy        | Warren         |
| <b>Davidson, R. Michael</b>       | Associate Professor | Literature        | Revelle        |
| <b>Davis, Fred</b>                | Professor           | Sociology         | Warren         |
| <b>Davis, Russ E.</b>             | Professor           | SIO               | SIO            |
| <b>Davis, Susan G.</b>            | Assistant Professor | Communication     | Warren         |
| <b>Dayton, Paul K.</b>            | Professor           | SIO               | SIO            |
| <b>Deak, Frantisek, J.</b>        | Associate Professor | Theatre           | Warren         |
| <b>DeLuca, Marlene A.</b>         | Professor           | Chemistry         | Warren/SchMed  |
| <b>Dennis, Edward A.</b>          | Professor           | Chemistry         | Revelle/SchMed |
| <b>Deutsch, J. Anthony</b>        | Professor           | Psychology        | Muir/SchMed    |
| <b>Dharanipragada, Bhaskarrao</b> | Assistant Professor | AMES              | Revelle        |
| <b>Dijkstra, Abraham J.</b>       | Professor           | Literature        | Revelle        |
| <b>Donoghue, Daniel J.</b>        | Assistant Professor | Chemistry         | Revelle/SchMed |
| <b>Doolittle, Russell F.</b>      | Professor           | Chemistry         | Revelle        |
| <b>Doppelt, Gerald D.</b>         | Professor           | Philosophy        | Muir           |
| <b>Dorman, LeRoy M.</b>           | Professor           | SIO               | SIO            |
| <b>Douglas, Jack D.</b>           | Professor           | Sociology         | Muir           |
| <b>Dower, John D.</b>             | Professor           | History           | Third          |
| <b>Drake, Paul W.</b>             | Professor           | Political Science | Warren         |
| <b>Driver, Bruce K.</b>           | Assistant Professor | Mathematics       | Third          |
| <b>Dryden, Deborah M.</b>         | Associate Professor | Theatre           | Warren         |
| <b>Dublin, Thomas L.</b>          | Associate Professor | History           | Third          |
| <b>duBois, Page A.</b>            | Professor           | Literature        | Muir           |
| <b>Dunseath, Thomas K.</b>        | Associate Professor | Literature        | Revelle        |
| <b>Duntley, Seibert Q.</b>        | Professor Emeritus  | SIO               | SIO            |
| <b>Dutton, Richard W.</b>         | Professor           | Biology           | SchMed         |
| <b>Dymond, Patrick</b>            | Associate Professor | CSE               | Warren         |
| <b>Ebbesen, Ebbe B.</b>           | Professor           | Psychology        | Muir           |
| <b>Edelman, Robert S.</b>         | Associate Professor | History           | Revelle        |
| <b>Ellis, Albert T.</b>           | Professor Emeritus  | AMES              | Revelle        |
| <b>Elman, Jeffrey L.</b>          | Associate Professor | Linguistics       | Muir           |
| <b>Engel, Albert E. J.</b>        | Professor           | SIO               | SIO            |
| <b>Engle, Robert F.</b>           | Professor           | Economics         | Third          |
| <b>Enright, James T.</b>          | Professor           | SIO               | SIO            |
| <b>Enright, Thomas J.</b>         | Professor           | Mathematics       | Third          |
| <b>Erickson, Robert</b>           | Professor Emeritus  | Music             | Muir           |

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|---------------------------------|------------------------|---------------------------|----------------|
| <b>Erie, Steven P.</b>          | Assistant Professor    | Political Science         | Third          |
| <b>Evans, John W.</b>           | Professor              | Mathematics               | Muir/SchMed    |
| <b>Evans, Peter B.</b>          | Professor              | IR/PS-Sociology           | IR/PS          |
| <b>Evans, Ronald J.</b>         | Associate Professor    | Mathematics               | Third          |
| <b>Fahey, Robert C.</b>         | Professor              | Chemistry                 | Revelle        |
| <b>Fantino, Edmund J.</b>       | Professor              | Psychology                | Muir           |
| <b>Farber, Manny</b>            | Professor              | Visual Arts               | Muir           |
| <b>Farrell, Peter</b>           | Professor              | Music                     | Warren         |
| <b>Faulkner, D. John</b>        | Professor              | SIO                       | SIO/Revelle    |
| <b>Feher, George</b>            | Professor              | Physics                   | Revelle        |
| <b>Fejer, Jules A.</b>          | Professor Emeritus     | ECE                       | Muir           |
| <b>Felbeck, Horst</b>           | Assistant Professor    | SIO                       | SIO            |
| <b>Fenical, William H.</b>      | Professor-in-Residence | SIO                       | SIO            |
| <b>Fenner-Lopez, Claudio E.</b> | Lecturer (SOE)         | Visual Arts/Communication | Third          |
| <b>Fillmore, Jay P.</b>         | Professor              | Mathematics               | Muir           |
| <b>Firtel, Richard A.</b>       | Professor              | Biology                   | Revelle        |
| <b>FitzGerald, Carl H.</b>      | Professor              | Mathematics               | Revelle        |
| <b>Fitzgerald, William C.</b>   | Associate Professor    | Literature                | Warren         |
| <b>Fonville, John W.</b>        | Assistant Professor    | Music                     | Revelle        |
| <b>Forbes, Douglass Jane</b>    | Assistant Professor    | Biology                   | Muir           |
| <b>Fortes, P. A. George</b>     | Associate Professor    | Biology                   | Third          |
| <b>Francois, Jean-Charles</b>   | Professor              | Music                     | Muir           |
| <b>Frankel, Theodore T.</b>     | Professor              | Mathematics               | Revelle        |
| <b>Frazer, William R.</b>       | Professor              | Physics                   | Third          |
| <b>Fredkin, Donald R.</b>       | Professor              | Physics                   | Revelle        |
| <b>Fredman, Michael L.</b>      | Professor              | Mathematics               | Warren         |
| <b>Freedman, David N.</b>       | Professor              | History                   | Revelle        |
| <b>Freedman, Michael H.</b>     | Professor              | Mathematics               | Revelle        |
| <b>Freifeld, Mary</b>           | Assistant Professor    | Sociology                 | Muir           |
| <b>Frenk, Margit</b>            | Professor Emeritus     | Literature                | Third          |
| <b>Friedkin, Morris E.</b>      | Professor              | Biology                   | Revelle/SchMed |
| <b>Friedman, Richard E.</b>     | Associate Professor    | Literature                | Muir           |
| <b>Frieman, Edward A.</b>       | Prof/V Chan/Dean/Dir   | SIO/Mar Sci/SIO           | SIO            |
| <b>Fung, Yuan-Cheng B.</b>      | Professor              | AMES                      | Revelle/SchMed |
| <b>Fussell, Edwin S.</b>        | Professor              | Literature                | Muir           |
| <b>Gaffney, Floyd</b>           | Professor              | Theatre                   | Third          |
| <b>Galbraith, John S.</b>       | Professor Emeritus     | History                   | Revelle        |
| <b>Garsia, Adriano M.</b>       | Professor              | Mathematics               | Revelle/SchMed |
| <b>Gearhart, Suzanne C.</b>     | Associate Professor    | Literature                | Muir           |
| <b>Geiduschek, E. Peter</b>     | Professor              | Biology                   | SchMed         |
| <b>Getoor, Ronald K.</b>        | Professor              | Mathematics               | Revelle/SchMed |
| <b>Gharib, Morteza</b>          | Assistant Professor    | AMES                      | Muir           |
| <b>Gibson, Carl H.</b>          | Professor              | AMES/SIO                  | Revelle/SIO    |
| <b>Gleskes, Joris M. T.M.</b>   | Professor              | SIO                       | SIO            |
| <b>Gilbert, J. Freeman</b>      | Professor              | SIO/IGPP                  | SIO            |
| <b>Gilpin, Michael E.</b>       | Professor              | Biology                   | Muir           |
| <b>Goldberg, Edward D.</b>      | Professor              | SIO                       | SIO            |
| <b>Goodkind, John M.</b>        | Professor              | Physics                   | Revelle        |
| <b>Goodman, Murray</b>          | Professor              | Chemistry                 | Revelle        |

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|----------------------------------|-------------------------|-------------------------|----------------|
| <b>Gorin, Jean-Pierre</b>        | Associate Professor     | Visual Arts             | Third          |
| <b>Gough, David A.</b>           | Associate Professor     | AMES                    | Third          |
| <b>Gould, Robert J.</b>          | Professor               | Physics                 | Revelle        |
| <b>Gourevitch, Peter A.</b>      | Professor/Dean          | Political Science-IR/PS | IR/PS          |
| <b>Granger, Clive W. J.</b>      | Professor               | Economics               | Warren         |
| <b>Grayson, Matthew A.</b>       | Assistant Professor     | Mathematics             | Warren         |
| <b>Green, Melvin H.</b>          | Professor               | Biology                 | Revelle        |
| <b>Greenstein, Jack M.</b>       | Assistant Professor     | Visual Arts             | Muir           |
| <b>Grobstein, Clifford</b>       | Professor               | Biology                 | Revelle/SchMed |
| <b>Groves, Theodore</b>          | Professor               | Economics               | Revelle        |
| <b>Guasch, J. Luis</b>           | Associate Professor     | Economics               | Revelle        |
| <b>Guest, Clark C.</b>           | Assistant Professor     | ECE                     | Warren         |
| <b>Gusfield, Joseph R.</b>       | Professor               | Sociology               | Muir           |
| <b>Gutierrez, Ramon A.</b>       | Assistant Professor     | History                 | Third          |
| <b>Guza, Robert T.</b>           | Associate Professor     | SIO                     | SIO            |
| <b>Haff, Leonard R.</b>          | Professor               | Mathematics             | Third          |
| <b>Hahn, Steven</b>              | Associate Professor     | History                 | Muir           |
| <b>Haldane, F. Duncan M.</b>     | Professor               | Physics                 | Muir           |
| <b>Halkin, Hubert</b>            | Professor               | Mathematics             | Revelle        |
| <b>Halleck, DeeDee</b>           | Lecturer (SOE)          | Communication           | Warren         |
| <b>Hallin, Daniel C.</b>         | Associate Professor     | Communication           | Third          |
| <b>Halpern, Francis R.</b>       | Professor Emeritus      | Physics                 | Muir           |
| <b>Hamburger, Robert N.</b>      | Professor               | Pediatrics              | Revelle/SchMed |
| <b>Hamilton, Richard S.</b>      | Professor               | Mathematics             | Warren         |
| <b>Hammel, Harold T.</b>         | Professor               | SIO                     | SIO/SchMed     |
| <b>Harkins, Edwin L.</b>         | Professor               | Music                   | Muir           |
| <b>Harper, Elvin</b>             | Professor               | Chemistry               | Third          |
| <b>Harris, William A.</b>        | Associate Professor     | Biology                 | Third          |
| <b>Harrison, Helen M.</b>        | Professor               | Visual Arts             | Revelle        |
| <b>Harrison, Newton A.</b>       | Professor               | Visual Arts             | Revelle        |
| <b>Haubrich, Richard A.</b>      | Professor Emeritus      | SIO                     | SchMed         |
| <b>Hawkins, James W.</b>         | Professor               | SIO                     | Revelle/SIO    |
| <b>Haxo, Francis T.</b>          | Professor               | SIO                     | SIO            |
| <b>Hayashi, Masaki</b>           | Professor               | Biology                 | Revelle        |
| <b>Haygood, Margo G.</b>         | Assistant Professor     | SIO                     | SIO            |
| <b>Hedrick, Stephen M.</b>       | Assistant Professor     | Biology                 | Third          |
| <b>Hegemier, Gilbert A.</b>      | Professor               | AMES                    | Revelle        |
| <b>Heiligenberg, Walter F.</b>   | Professor               | SIO                     | SIO            |
| <b>Helinski, Donald R.</b>       | Professor               | Biology                 | Third          |
| <b>Heller, Walter P.</b>         | Professor               | Economics               | Revelle        |
| <b>Helstrom, Carl W.</b>         | Professor               | ECE                     | Muir           |
| <b>Helton, John W.</b>           | Professor               | Mathematics             | Third          |
| <b>Hendershott, Myrl C.</b>      | Professor               | SIO                     | SIO            |
| <b>Herz, Richard K.</b>          | Acting Assoc. Professor | AMES                    | Warren         |
| <b>Hessler, Robert R.</b>        | Professor               | SIO                     | SIO            |
| <b>Hirsch, Harry N.</b>          | Associate Professor     | Political Science       | Warren         |
| <b>Hirsch, Jorge E.</b>          | Associate Professor     | Physics                 | Revelle        |
| <b>Hock, Louis J.</b>            | Associate Professor     | Visual Arts             | Third          |
| <b>Hodgkiss, William S., Jr.</b> | Associate Professor     | SIO                     | SIO            |
| <b>Holland, John J.</b>          | Professor               | Biology                 | Warren         |

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|-----------------------------------|---------------------|-------------------|----------------|
| <b>Holland, Nicholas D.</b>       | Professor           | SIO               | SIO/Revelle    |
| <b>Hooper, John W.</b>            | Professor Emeritus  | Economics         | Revelle        |
| <b>Horwitz, Robert B.</b>         | Assistant Professor | Communication     | Third          |
| <b>Howden, William E.</b>         | Professor           | CSE               | Muir           |
| <b>Howell, Stephen H.</b>         | Professor           | Biology           | Muir           |
| <b>Hu, Ping C.</b>                | Lecturer (SOE)      | History           | Muir           |
| <b>Hu, Te C.</b>                  | Professor           | CSE               | Warren         |
| <b>Huerta, Jorge A.</b>           | Associate Professor | Theatre           | Third          |
| <b>Hughes, H. Stuart</b>          | Professor Emeritus  | History           | Revelle        |
| <b>Hughes, Judith M.</b>          | Professor           | History           | Warren         |
| <b>Inman, Douglas L.</b>          | Professor           | SIO               | SIO            |
| <b>Intaglietta, Marcos</b>        | Professor           | AMES              | Revelle/SchMed |
| <b>Irons, Peter H.</b>            | Professor           | Political Science | Warren         |
| <b>Israel, Robert A.</b>          | Professor           | Theatre           | Warren         |
| <b>Jackson, Gabriel</b>           | Professor Emeritus  | History           | Revelle        |
| <b>Jacobson, Gary C.</b>          | Professor           | Political Science | Third          |
| <b>James, Luther</b>              | Associate Professor | Theatre           | Muir           |
| <b>Jed, Stephanie H.</b>          | Assistant Professor | Literature        | Revelle        |
| <b>Jolley, S. Nicholas</b>        | Associate Professor | Philosophy        | Revelle        |
| <b>Jones, Barbara</b>             | Associate Professor | Physics           | Muir           |
| <b>Jones, Walton</b>              | Associate Professor | Theatre           | Muir           |
| <b>Jordan, David K.</b>           | Professor           | Anthropology      | Revelle        |
| <b>Jules-Rosette, Bennetta W.</b> | Professor           | Sociology         | Muir           |
| <b>Kahler, Miles E.</b>           | Professor           | IR/PS             | IR/PS          |
| <b>Kahr, Madlyn M.</b>            | Professor Emeritus  | Visual Arts       | Warren         |
| <b>Kamen, Martin D.</b>           | Professor Emeritus  | Chemistry         | Revelle        |
| <b>Kaminsky, Graciela L.</b>      | Assistant Professor | Economics         | Warren         |
| <b>Kaprow, Allan</b>              | Professor           | Visual Arts       | Warren         |
| <b>Kastner, Miriam</b>            | Professor           | SIO               | SIO/Revelle    |
| <b>Kearns, David R.</b>           | Professor           | Chemistry         | Revelle        |
| <b>Keeling, Charles D.</b>        | Professor           | SIO               | SIO            |
| <b>Kernell, Samuel H.</b>         | Professor           | Political Science | Warren         |
| <b>Keyssar, Helene</b>            | Professor           | Communication     | Third          |
| <b>Kirkpatrick, Susan</b>         | Associate Professor | Literature        | Muir           |
| <b>Kitcher, Patricia W.</b>       | Associate Professor | Philosophy        | Muir           |
| <b>Kitcher, Philip S.</b>         | Professor           | Philosophy        | Warren         |
| <b>Klein, Rachel</b>              | Assistant Professor | History           | Warren         |
| <b>Klima, Edward S.</b>           | Professor           | Linguistics       | Muir           |
| <b>Komlos, Janos</b>              | Professor           | Mathematics       | Warren         |
| <b>Konecni, Vladimir J.</b>       | Professor           | Psychology        | Muir           |
| <b>Krause, Lawrence</b>           | Professor           | IR/PS             | IR/PS          |
| <b>Kraut, Joseph</b>              | Professor           | Chemistry         | Revelle        |
| <b>Kristan, William B., Jr.</b>   | Professor           | Biology           | Third          |
| <b>Kroll, Norman M.</b>           | Professor           | Physics           | Revelle        |
| <b>Ku, Walter H.</b>              | Professor           | ECE               | Revelle        |
| <b>Kulik, James A.</b>            | Associate Professor | Psychology        | Warren         |
| <b>Kuroda, Sige-Yuki</b>          | Professor           | Linguistics       | Muir           |

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| <b>Kuti, Julius G.</b>         | Professor           | Physics           | Third          |
| <b>Kyte, Jack E.</b>           | Professor           | Chemistry         | Warren         |
| <b>Laitin, David D.</b>        | Professor           | Political Science | Third          |
| <b>Lakoff, Sanford A.</b>      | Professor           | Political Science | Warren         |
| <b>Lal, Devendra</b>           | Professor           | SIO               | SIO            |
| <b>Langacker, Ronald W.</b>    | Professor           | Linguistics       | Revelle        |
| <b>Langdon, Margaret H.</b>    | Professor           | Linguistics       | Warren         |
| <b>Lau, Silvanus S.</b>        | Professor           | ECE               | Muir           |
| <b>Lawder, Standish D.</b>     | Associate Professor | Visual Arts       | Warren         |
| <b>Lawrance, Emily C.</b>      | Assistant Professor | Economics         | Muir           |
| <b>Ledden, Patrick J.</b>      | Lecturer (SOE)      | Mathematics       | Muir           |
| <b>Lee, Edward N.</b>          | Professor           | Philosophy        | Revelle        |
| <b>Lee, Sing H.</b>            | Professor           | ECE               | Muir           |
| <b>Lettau, Reinhard</b>        | Professor           | Literature        | Revelle        |
| <b>Levy, Robert I.</b>         | Professor           | Anthropology      | Muir           |
| <b>Lewak, George J.</b>        | Associate Professor | ECE               | Muir           |
| <b>Lewin, Ralph A.</b>         | Professor           | SIO               | SIO            |
| <b>Libby, Paul A.</b>          | Professor           | AMES              | Revelle        |
| <b>Liebermann, Leonard N.</b>  | Professor Emeritus  | Physics           | Revelle        |
| <b>Lijphart, Arend</b>         | Professor           | Political Science | Revelle        |
| <b>Lin, James P.</b>           | Professor           | Mathematics       | Muir           |
| <b>Lin, Shao-Chi</b>           | Professor           | AMES              | Revelle        |
| <b>Lindenberg, Katja</b>       | Professor           | Chemistry         | Third          |
| <b>Lindsley, Dan L.</b>        | Professor           | Biology           | Revelle/SchMed |
| <b>Lloyd, Elisabeth A.</b>     | Assistant Professor | Philosophy        | Revelle        |
| <b>Lonidier, Fred S.</b>       | Associate Professor | Visual Arts       | Revelle        |
| <b>Loomis, William F., Jr.</b> | Professor           | Biology           | Revelle        |
| <b>Lopez-Gonzalez, Aralia</b>  | Assistant Professor | Literature        | Revelle        |
| <b>Lord, Charles L.</b>        | Assistant Professor | Visual Arts       | Muir           |
| <b>Lovberg, Ralph H.</b>       | Professor           | Physics           | Revelle        |
| <b>Lowe, Catherine</b>         | Assistant Professor | Literature        | Warren         |
| <b>Lowe, Lisa</b>              | Assistant Professor | Literature        | Muir           |
| <b>Luco, J. Enrique</b>        | Professor           | AMES              | Third          |
| <b>Luft, David S.</b>          | Associate Professor | History           | Revelle        |
| <b>Lugannani, Robert</b>       | Professor           | ECE               | Warren         |
| <b>Lumpkin, Oscar J.</b>       | Associate Professor | Physics           | Revelle        |
| <b>Luo, Huey-Lin</b>           | Professor           | ECE               | Muir           |
| <b>Lyon, James K.</b>          | Professor           | Literature        | Revelle        |
| <b>Lytle, Cecil W.</b>         | Professor           | Music             | Third          |
| <b>Machina, Mark J.</b>        | Associate Professor | Economics         | Revelle        |
| <b>Macdougall, J. Douglas</b>  | Professor           | SIO               | Revelle/SIO    |
| <b>MacLeod, Donald I.A.</b>    | Professor           | Psychology        | Muir           |
| <b>Madsen, Richard P.</b>      | Professor           | Sociology         | Muir           |
| <b>Magde, Douglas</b>          | Professor           | Chemistry         | Warren         |
| <b>Maimberg, John H.</b>       | Professor           | Physics           | Revelle        |
| <b>Manaster, Alfred B.</b>     | Professor           | Mathematics       | Revelle        |
| <b>Mandler, George</b>         | Professor           | Psychology        | Muir           |
| <b>Mandler, Jean M.</b>        | Professor           | Psychology        | Revelle        |
| <b>Maple, M. Brian</b>         | Professor           | Physics           | Revelle        |

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|--------------------------------|--------------------------|-------------------------|---------------|
| <b>Mares, David R.</b>         | Assistant Professor      | Political Science       | Muir          |
| <b>Marino, John A.</b>         | Associate Professor      | History                 | Revelle       |
| <b>Mariscal, George L.</b>     | Assistant Professor      | Literature              | Warren        |
| <b>Marti, Kurt</b>             | Professor                | Chemistry               | Revelle       |
| <b>Masek, George E.</b>        | Professor                | Physics                 | Revelle       |
| <b>Masry, Elias</b>            | Professor                | ECE                     | Muir          |
| <b>Masters, T. Guy</b>         | Associate Professor      | SIO                     | SIO           |
| <b>McCubbins, Mathew D.</b>    | Associate Professor      | Political Science       | Third         |
| <b>McDaniel, Timothy L.</b>    | Associate Professor      | Sociology               | Revelle       |
| <b>McElroy, William D.</b>     | Professor                | Biology                 | Revelle       |
| <b>McGowan, John A.</b>        | Professor                | SIO                     | SIO           |
| <b>McIlwain, Carl E.</b>       | Professor                | Physics                 | Revelle       |
| <b>McMorris, Trevor C.</b>     | Professor                | Chemistry               | Third         |
| <b>Meeker, Michael E.</b>      | Professor                | Anthropology            | Revelle       |
| <b>Mehan, Hugh B., Jr.</b>     | Professor                | Sociology               | Third         |
| <b>Meiners, Larry G.</b>       | Associate Professor      | ECE                     | Third         |
| <b>Mendis, D. Asoka</b>        | Professor                | ECE                     | Muir          |
| <b>Metzger, Thomas A.</b>      | Professor                | History                 | Muir          |
| <b>Middleman, Stanley</b>      | Professor                | AMES                    | Warren        |
| <b>Miles, John W.</b>          | Professor Emeritus       | AMES                    | Warren        |
| <b>Miller, David R.</b>        | Professor                | AMES                    | Revelle       |
| <b>Miller, Jeffrey O.</b>      | Associate Professor      | Psychology              | Revelle       |
| <b>Miller, Stanley L.</b>      | Professor                | Chemistry               | Revelle       |
| <b>Mills, Stanley E.</b>       | Professor                | Biology                 | Muir          |
| <b>Milstein, Laurence B.</b>   | Professor                | ECE                     | Warren        |
| <b>Mitchell, Allan</b>         | Professor                | History                 | Muir          |
| <b>Miyoshi, Masao</b>          | Professor                | Literature              | Muir          |
| <b>Montal, S. Mauricio</b>     | Professor                | Physics/Biology         | Revelle       |
| <b>Monteon, Michael P.</b>     | Associate Professor      | History                 | Muir          |
| <b>Montrose, Louis A.</b>      | Professor                | Literature              | Revelle       |
| <b>Moore, F. Richard</b>       | Professor                | Music                   | Revelle       |
| <b>Moore, Stanley W.</b>       | Professor Emeritus       | Philosophy              | Revelle       |
| <b>Mosshammer, Alden A.</b>    | Professor                | History                 | Revelle       |
| <b>Mukerji, Chandra</b>        | Associate Professor      | Sociology/Communication | Third         |
| <b>Mullin, Michael M.</b>      | Professor                | SIO                     | SIO           |
| <b>Munk, Walter H.</b>         | Professor                | SIO                     | SIO/Warren    |
| <b>Murakami, Hidenori</b>      | Associate Professor      | AMES                    | Revelle       |
| <b>Nachbar, William</b>        | Professor                | AMES                    | Revelle       |
| <b>Nancy, Jean-Luc</b>         | Professor                | Literature              | Muir          |
| <b>Nathanson, Charles E.</b>   | Assistant Professor      | Sociology               | Muir          |
| <b>Nee, Thomas B.</b>          | Professor                | Music                   | Warren        |
| <b>Negyesy, Janos</b>          | Professor                | Music                   | Muir          |
| <b>Nemat-Nasser, Siavouche</b> | Professor                | AMES                    | Revelle       |
| <b>Nesbitt, Muriel N.</b>      | Associate Professor      | Biology                 | SchMed/Warren |
| <b>Newman, William A.</b>      | Professor                | SIO                     | SIO           |
| <b>Newmark, Leonard D.</b>     | Professor                | Linguistics             | Revelle       |
| <b>Newport, John W.</b>        | Assistant Professor      | Biology                 | Muir          |
| <b>Nierenberg, William A.</b>  | Prof/V Chan/Dir Emeritus | Physics/Mar Sci/SIO     | SIO           |
| <b>Niiler, Pearn P.</b>        | Professor                | SIO                     | SIO           |



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|-----------------------------------|---------------------|-------------------|--------------|
| <b>Nodelman, Sheldon A.</b>       | Associate Professor | Visual Arts       | Warren       |
| <b>Norman, Donald A.</b>          | Professor           | Psychology        | Revelle      |
| <b>O'Brien, William A.</b>        | Assistant Professor | Literature        | Muir         |
| <b>O'Connor, Joseph M.</b>        | Assistant Professor | Chemistry         | Third        |
| <b>Oesterreicher, Hans K.</b>     | Professor           | Chemistry         | Muir         |
| <b>Ogdon, Wilbur L.</b>           | Professor           | Music             | Muir         |
| <b>Okamura, Melvin Y.</b>         | Professor           | Physics           | Revelle      |
| <b>Olafson, Frederick A.</b>      | Professor           | Philosophy        | Revelle      |
| <b>Olfe, Daniel B.</b>            | Professor           | AMES              | Revelle      |
| <b>Olshen, Richard</b>            | Professor           | Mathematics       | SchMed       |
| <b>O'Neil, Thomas M.</b>          | Professor           | Physics           | Warren       |
| <b>Orcutt, John A.</b>            | Professor           | SIO               | SIO          |
| <b>Orloff, Marshall J.</b>        | Professor           | Surgery           | SchMed/Muir  |
| <b>Owe, Olaf</b>                  | Assistant Professor | CSE               | Revelle      |
| <b>Padden, Carol A.</b>           | Assistant Professor | Communication     | Third        |
| <b>Paris, Jehan Francois</b>      | Assistant Professor | CSE               | Warren       |
| <b>Parker, Robert L.</b>          | Professor           | SIO               | SIO          |
| <b>Parrish, Michael E.</b>        | Professor           | History           | Muir         |
| <b>Pashler, Harold E.</b>         | Assistant Professor | Psychology        | Muir         |
| <b>Pasler, Jann C.</b>            | Assistant Professor | Music             | Warren       |
| <b>Patterson, Patricia A.</b>     | Associate Professor | Visual Arts       | Muir         |
| <b>Paturi, Ramamohan</b>          | Assistant Professor | CSE               | Warren       |
| <b>Pearce, Roy Harvey</b>         | Professor           | Literature        | Revelle      |
| <b>Pearson, J. Steven</b>         | Associate Professor | Theatre           | Muir         |
| <b>Penn, Nolan E.</b>             | Professor           | Psychiatry        | SchMed/Third |
| <b>Penner, Stanford S.</b>        | Professor           | AMES              | Revelle      |
| <b>Perlmutter, David M.</b>       | Professor           | Linguistics       | Warren       |
| <b>Perrin, Charles L.</b>         | Professor           | Chemistry         | Revelle      |
| <b>Peterson, Laurence E.</b>      | Professor           | Physics           | Revelle      |
| <b>Peterson, Melvin N. A.</b>     | Associate Professor | SIO               | SIO          |
| <b>Phillips, David P.</b>         | Professor           | Sociology         | Revelle      |
| <b>Phillips, Robyn S.</b>         | Assistant Professor | Economics         | Third        |
| <b>Phleger, Fred B</b>            | Professor Emeritus  | SIO               | SIO          |
| <b>Piccioni, Oreste</b>           | Professor Emeritus  | Physics           | Revelle      |
| <b>Pickowicz, Paul G.</b>         | Associate Professor | History           | Muir         |
| <b>Pinkel, Robert</b>             | Associate Professor | SIO               | SIO          |
| <b>Pinon, Ramon, Jr.</b>          | Associate Professor | Biology           | Third        |
| <b>Pippin, Robert B.</b>          | Associate Professor | Philosophy        | Revelle      |
| <b>Plantamura, Carol</b>          | Professor           | Music             | Revelle      |
| <b>Pomeroy, Earl</b>              | Professor Emeritus  | History           | Warren       |
| <b>Poole, Fitz John P.</b>        | Associate Professor | Anthropology      | Muir         |
| <b>Popkin, Samuel L.</b>          | Associate Professor | Political Science | Third        |
| <b>Posakony, James W.</b>         | Assistant Professor | Biology           | Third        |
| <b>Price, Paul A.</b>             | Professor           | Biology           | Muir         |
| <b>Raitt, Russell W.</b>          | Professor Emeritus  | SIO               | SIO          |
| <b>Ramachandran, Vilayanur S.</b> | Assistant Professor | Psychology        | Third        |
| <b>Ramanathan, Ramachandra</b>    | Professor           | Economics         | Revelle      |
| <b>Rand, Sinai</b>                | Associate Professor | AMES              | Revelle      |

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| <b>Randel, Fred V.</b>             | Associate Professor | Literature                | Revelle     |
| <b>Rao, Ramesh</b>                 | Assistant Professor | ECE                       | Revelle     |
| <b>Rauch, James E.</b>             | Assistant Professor | Economics                 | Third       |
| <b>Reid, Joseph L.</b>             | Professor           | SIO                       | SIO         |
| <b>Reissner, M. Erich</b>          | Professor Emeritus  | AMES/Mathematics          | Revelle     |
| <b>Remmel, Jeffrey D.</b>          | Professor           | Mathematics               | Muir        |
| <b>Revelle, Roger R.</b>           | Professor Emeritus  | Political Science         | Revelle     |
| <b>Reynolds, Edward</b>            | Professor           | History                   | Third       |
| <b>Reynolds, George S.</b>         | Professor           | Psychology                | Muir        |
| <b>Reynolds, Roger L.</b>          | Professor           | Music                     | Muir        |
| <b>Rice, John A.</b>               | Professor           | Mathematics               | Revelle     |
| <b>Rickett, Barnaby J.</b>         | Professor           | ECE                       | Muir        |
| <b>Riddell, Richard V.</b>         | Professor           | Theatre                   | Revelle     |
| <b>Ringgold, Faith</b>             | Professor           | Visual Arts               | Warren      |
| <b>Ringrose, David R.</b>          | Professor           | History                   | Revelle     |
| <b>Ritchie, Robert C.</b>          | Professor           | History                   | Muir        |
| <b>Roberson, Robert E.</b>         | Professor           | AMES                      | Revelle     |
| <b>Rodin, Burton</b>               | Professor           | Mathematics               | Muir        |
| <b>Rohrl, Helmut</b>               | Professor           | Mathematics               | Revelle     |
| <b>Rosenblatt, Murray</b>          | Professor           | Mathematics               | Muir        |
| <b>Rosenblatt, Richard H.</b>      | Professor           | SIO                       | SIO         |
| <b>Ross, Lola R.</b>               | Professor           | Comm & Fam Medicine       | SchMed/Muir |
| <b>Rotenberg, Manuel</b>           | Professor           | ECE                       | Muir        |
| <b>Rothschild, Linda</b>           | Professor           | Mathematics               | Warren      |
| <b>Rothschild, Michael</b>         | Professor/Dean      | Economics/Social Sciences | Third       |
| <b>Ruckenstein, Andrei E.</b>      | Assistant Professor | Physics                   | Revelle     |
| <b>Rudee, M. Lea</b>               | Professor/Dean      | ECE/Engineering           | Warren      |
| <b>Ruiz, Ramon E.</b>              | Professor           | History                   | Muir        |
| <b>Rumsey, Victor H.</b>           | Professor Emeritus  | ECE                       | Muir        |
| <b>Russell, Percy J.</b>           | Associate Professor | Biology                   | SchMed      |
| <b>Saier, Milton H., Jr.</b>       | Professor           | Biology                   | Muir        |
| <b>Salmon, Richard L.</b>          | Associate Professor | SIO                       | SIO         |
| <b>Saltman, Paul D.</b>            | Professor           | Biology                   | Revelle     |
| <b>Sanchez, Marta E.</b>           | Associate Professor | Literature                | Third       |
| <b>Sanchez, Rosaura</b>            | Associate Professor | Literature                | Third       |
| <b>Saville, Jonathan</b>           | Associate Professor | Theatre                   | Revelle     |
| <b>Saville, Julie</b>              | Assistant Professor | History                   | Third       |
| <b>Savitch, Walter J.</b>          | Professor           | CSE                       | Muir        |
| <b>Scanga, Italo</b>               | Professor           | Visual Arts               | Muir        |
| <b>Schane, Sanford A.</b>          | Professor           | Linguistics               | Revelle     |
| <b>Scheffler, Immo E.</b>          | Professor           | Biology                   | Revelle     |
| <b>Schiller, Herbert I.</b>        | Professor           | Communication             | Third       |
| <b>Schmid-Schoenbein, Geert W.</b> | Associate Professor | AMES                      | SchMed      |
| <b>Schneider, Alan M.</b>          | Professor           | AMES                      | Warren      |
| <b>Schoen, Richard M.</b>          | Professor           | Mathematics               | Warren      |
| <b>Schrauzer, Gerhard N.</b>       | Professor           | Chemistry                 | Revelle     |
| <b>Schreibman, Laura E.</b>        | Professor           | Psychology                | Warren      |
| <b>Schudson, Michael S.</b>        | Professor           | Sociology/Communication   | Third       |
| <b>Schuller, Ivan K.</b>           | Professor           | Physics                   | Revelle     |
| <b>Schultz, Sheldon</b>            | Professor           | Physics                   | Third       |

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|----------------------------------|-----------------------|--------------------------|----------------|
| <b>Schwartz, Theodore</b>        | Professor             | Anthropology             | Muir           |
| <b>Scull, Andrew</b>             | Professor             | Sociology                | Warren         |
| <b>Sebald, Anthony V.</b>        | Associate Professor   | AMES                     | Third          |
| <b>Seible, Frieder</b>           | Assistant Professor   | AMES                     | Third          |
| <b>Selverston, Allen I.</b>      | Professor             | Biology                  | Warren         |
| <b>Seshadri, Kalyanasundaram</b> | Associate Professor   | AMES                     | Third          |
| <b>Shaiken, Harley</b>           | Associate Professor   | Communication            | Revelle        |
| <b>Sham, Lu Jeu</b>              | Professor/Dean        | Physics/Natural Sciences | Warren         |
| <b>Shank, Adele E.</b>           | Professor             | Theatre                  | Third          |
| <b>Sharpe, Michael J.</b>        | Professor             | Mathematics              | Muir           |
| <b>Shenk, Norman A.</b>          | Associate Professor   | Mathematics              | Revelle        |
| <b>Shevelow, Kathryn</b>         | Assistant Professor   | Literature               | Warren         |
| <b>Shirk, Susan L.</b>           | Associate Professor   | Political Science        | Warren         |
| <b>Shor, George G., Jr.</b>      | Professor             | SIO                      | SIO            |
| <b>Shuler, Kurt E.</b>           | Professor             | Chemistry                | Revelle        |
| <b>Siegel, Jay S.</b>            | Assistant Professor   | Chemistry                | Muir           |
| <b>Silber, John J.</b>           | Professor             | Music                    | Muir           |
| <b>Simon, John D.</b>            | Assistant Professor   | Chemistry                | Muir           |
| <b>Singer, S. Jonathan</b>       | Professor             | Biology                  | Revelle/SchMed |
| <b>Small, Lance W.</b>           | Professor             | Mathematics              | Revelle        |
| <b>Smallwood, Dennis E.</b>      | Associate Professor   | Economics                | Warren         |
| <b>Smith, Donald R.</b>          | Professor             | Mathematics              | Revelle        |
| <b>Smith, Douglas W.</b>         | Professor             | Biology                  | Muir           |
| <b>Smith, Harding E.</b>         | Professor             | Physics                  | Revelle        |
| <b>Smith, Peter H.</b>           | Professor             | Political Science        | Third          |
| <b>Snyder, Jon R.</b>            | Assistant Professor   | Literature               | Warren         |
| <b>Sobel, Joel</b>               | Associate Professor   | Economics                | Revelle        |
| <b>Solis, Faustina</b>           | Professor/Provost     | Comm & Fam Med/Third     | Third          |
| <b>Somero, George N.</b>         | Professor             | SIO                      | SIO            |
| <b>Somerville, Richard C. J.</b> | Professor             | SIO                      | SIO            |
| <b>Sorensen, Harold W.</b>       | Professor             | AMES                     | Revelle        |
| <b>Spector, Deborah H.</b>       | Associate Professor   | Biology                  | SchMed         |
| <b>Spiess, Fred N.</b>           | Professor             | SIO                      | SIO            |
| <b>Spiro, Melford E.</b>         | Professor             | Anthropology             | Muir           |
| <b>Spitzer, Nicholas C.</b>      | Professor             | Biology                  | Muir           |
| <b>Stark, Harold M.</b>          | Professor             | Mathematics              | Muir           |
| <b>Starr, Ross M.</b>            | Professor             | Economics                | Warren         |
| <b>Steinmetz, Philip A.</b>      | Associate Professor   | Visual Arts              | Revelle        |
| <b>Stern, Herbert</b>            | Professor             | Biology                  | Third          |
| <b>Stewart, John L.</b>          | Professor             | Literature               | Muir           |
| <b>Stich, Stephen P.</b>         | Professor             | Philosophy               | Warren         |
| <b>Stiles-Davis, Joan</b>        | Assistant Professor   | Psychology               | Muir           |
| <b>Stinchcombe, Maxwell B.</b>   | Assistant Professor   | Economics                | Third          |
| <b>Stroll, Avrum</b>             | Professor             | Philosophy               | Revelle        |
| <b>Strong, Tracy B.</b>          | Professor             | Political Science        | Third          |
| <b>Strum, Shirley C.</b>         | Associate Professor   | Anthropology             | Revelle        |
| <b>Subramani, Suresh</b>         | Assistant Professor   | Biology                  | Warren         |
| <b>Suess, Hans E.</b>            | Professor Emeritus    | Chemistry                | Revelle/SIO    |
| <b>Sugihara, George</b>          | Assistant Professor   | SIO                      | SIO            |
| <b>Suhl, Harry</b>               | Professor             | Physics                  | Revelle        |
| <b>Swain, Susan L.</b>           | Associate Prof-in-Res | Biology                  | Revelle        |

UCSD FACULTY

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|                                 |                           |                          |             |
|---------------------------------|---------------------------|--------------------------|-------------|
| <b>Swanson, Robert A.</b>       | Professor                 | Physics                  | Revelle     |
| <b>Swartz, Marc J.</b>          | Professor                 | Anthropology             | Muir        |
| <b>Sworder, David D.</b>        | Professor                 | AMES                     | Revelle     |
| <b>Talbot, Jan B.</b>           | Assistant Professor       | AMES                     | Muir        |
| <b>Talke, Frank E.</b>          | Professor                 | AMES                     | Warren      |
| <b>Talley, Lynne D.</b>         | Assistant Professor       | SIO                      | SIO         |
| <b>Tauxe, Lisa</b>              | Assistant Professor       | SIO                      | SIO         |
| <b>Tay, William Shu-sam</b>     | Associate Professor       | Literature               | Muir        |
| <b>Taylor, Susan S.</b>         | Professor                 | Chemistry                | SchMed      |
| <b>Teilhet-Fisk, Jehanne H.</b> | Associate Professor       | Visual Arts              | Muir        |
| <b>Terdiman, Richard</b>        | Professor                 | Literature               | Muir        |
| <b>Terras, Audrey A.</b>        | Professor                 | Mathematics              | Revelle     |
| <b>Terrell, Tracy D.</b>        | Professor                 | Linguistics              | Revelle     |
| <b>Thiemens, Mark H.</b>        | Associate Professor       | Chemistry                | Third       |
| <b>Thiess, Frank B.</b>         | Lecturer (SOE)            | Mathematics              | Third       |
| <b>Thomas, Charles W. II</b>    | Professor                 | Third College (USP)      | Third       |
| <b>Thompson, William B.</b>     | Professor                 | Physics                  | Revelle     |
| <b>Ticho, Harold K.</b>         | Professor/Vice Chancellor | Physics/Academic Affairs | Third       |
| <b>Tilley, T. Don</b>           | Assistant Professor       | Chemistry                | Third       |
| <b>Tokuyasu, Kiyoteru</b>       | Professor-in-Residence    | Biology                  | Revelle     |
| <b>Tomlinson, Barbara</b>       | Assistant Professor       | Literature               | Muir        |
| <b>Toussaint, W. Douglas</b>    | Assistant Professor       | Physics                  | Revelle     |
| <b>Traylor, Teddy G.</b>        | Professor                 | Chemistry                | Revelle     |
| <b>Trogler, William C.</b>      | Professor                 | Chemistry                | Revelle     |
| <b>Tschirgi, Robert D.</b>      | Professor                 | Neurosciences            | SchMed/Muir |
| <b>Turetzky, Bertram J.</b>     | Professor                 | Music                    | Muir        |
| <b>Tuzin, Donald F.</b>         | Professor                 | Anthropology             | Revelle     |
| <b>Uht, Augustus K.</b>         | Assistant Professor       | CSE                      | Revelle     |
| <b>Vacquier, Victor</b>         | Professor Emeritus        | SIO                      | SIO         |
| <b>Vacquier, Victor D.</b>      | Professor                 | SIO                      | SIO         |
| <b>VanAtta, Charles W.</b>      | Professor                 | AMES/SIO                 | Revelle/SIO |
| <b>Van Young, Eric</b>          | Associate Professor       | History                  | Revelle     |
| <b>Varon, Silvio S.</b>         | Professor                 | Biology                  | SchMed      |
| <b>Vehrencamp, Sandra L.</b>    | Associate Professor       | Biology                  | Muir        |
| <b>Vendler, Zeno</b>            | Professor                 | Philosophy               | Muir        |
| <b>Vernon, Wayne</b>            | Professor                 | Physics                  | Revelle     |
| <b>Vianu, Victor D.</b>         | Assistant Professor       | CSE                      | Third       |
| <b>Viturbi, Andrew J.</b>       | Professor                 | ECE                      | Warren      |
| <b>Volcani, Benjamin E.</b>     | Professor Emeritus        | SIO                      | SIO         |
| <b>Vold, Regitze R.</b>         | Professor                 | Chemistry                | Revelle     |
| <b>Vold, Robert L.</b>          | Professor                 | Chemistry                | Revelle     |
| <b>Wadsworth, Adrian R.</b>     | Professor                 | Mathematics              | Warren      |
| <b>Wagner, Arthur</b>           | Professor                 | Theatre                  | Muir        |
| <b>Waisman, Carlos H.</b>       | Associate Professor       | Sociology                | Third       |
| <b>Walens, Stanley</b>          | Assistant Professor       | Anthropology             | Warren      |
| <b>Walk, Cynthia</b>            | Associate Professor       | Literature               | Revelle     |
| <b>Wang, Jean Yin Jen</b>       | Assistant Professor       | Biology                  | SchMed      |

|                               |                            |                                 |                |
|-------------------------------|----------------------------|---------------------------------|----------------|
| <b>Warschawski, Stefan E.</b> | Professor Emeritus         | Mathematics                     | Muir           |
| <b>Watson, Joseph W.</b>      | Assoc Prof/Vice Chancellor | Chemistry/Undergraduate Affairs | Third          |
| <b>Watson, Kenneth M.</b>     | Professor                  | SIO                             | SIO            |
| <b>Wavrik, John J.</b>        | Associate Professor        | Mathematics                     | Muir           |
| <b>Wayne, Don E.</b>          | Associate Professor        | Literature                      | Muir           |
| <b>Weare, John H.</b>         | Professor                  | Chemistry                       | Revelle        |
| <b>Weiss, Laurence</b>        | Associate Professor        | Economics                       | Muir           |
| <b>Weiss, Ray F.</b>          | Professor                  | SIO                             | SIO            |
| <b>Wenkert, Ernest</b>        | Professor                  | Chemistry                       | Revelle        |
| <b>Wertsch, James V.</b>      | Professor                  | Communication                   | Third          |
| <b>Wesling, Donald T.</b>     | Professor                  | Literature                      | Muir           |
| <b>Wheeler, John C.</b>       | Professor                  | Chemistry                       | Revelle        |
| <b>White, Fred N.</b>         | Professor                  | Medicine                        | SchMed/SIO     |
| <b>White, Halbert L.</b>      | Professor                  | Economics                       | Revelle        |
| <b>Wieder, Harry H.</b>       | Professor-in-Residence     | ECE                             | Muir           |
| <b>Wierschin, Martin W.</b>   | Professor                  | Literature                      | Revelle        |
| <b>Williams, Ben A.</b>       | Professor                  | Psychology                      | Muir           |
| <b>Williams, Ruth J.</b>      | Assistant Professor        | Mathematics                     | Warren         |
| <b>Williams, Sherley A.</b>   | Professor                  | Literature                      | Third          |
| <b>Williamson, Stanley G.</b> | Professor                  | Mathematics                     | Revelle        |
| <b>Wills, Christopher</b>     | Professor                  | Biology                         | Warren/SchMed  |
| <b>Wilson, Kent R.</b>        | Professor                  | Chemistry                       | Revelle        |
| <b>Winant, Clinton D.</b>     | Professor                  | SIO                             | SIO            |
| <b>Winterer, Edward L.</b>    | Professor                  | SIO                             | SIO            |
| <b>Wiseman, Jacqueline P.</b> | Professor                  | Sociology                       | Warren         |
| <b>Wolf, Jack K.</b>          | Professor                  | ECE                             | Third          |
| <b>Wong, David Y.</b>         | Professor/Provost          | Physics/Warren                  | Warren         |
| <b>Woo, Savio L-Y.</b>        | Professor                  | Surgery/AMES                    | SchMed         |
| <b>Woodruff, David S.</b>     | Professor                  | Biology                         | Muir           |
| <b>Wright, Andrew</b>         | Professor                  | Literature                      | Revelle        |
| <b>Wulbert, Daniel E.</b>     | Professor                  | Mathematics                     | Third          |
| <b>Xuong Nguyen-Huu</b>       | Professor                  | Biology/Chemistry/Physics       | Revelle/SchMed |
| <b>Yaffe, Michael P.</b>      | Assistant Professor        | Biology                         | Third          |
| <b>Yau, Shing-Tung</b>        | Professor                  | Mathematics                     | Muir           |
| <b>Yguerabide, Juan</b>       | Professor                  | Biology                         | Third          |
| <b>Yip, Wai-Lim</b>           | Professor                  | Literature                      | Muir           |
| <b>York, Herbert F.</b>       | Professor                  | Physics                         | Warren         |
| <b>Yu, Paul K. L.</b>         | Assistant Professor        | ECE                             | Revelle        |
| <b>Yuasa, Joji</b>            | Professor                  | Music                           | Warren         |
| <b>Zamosc, Leon</b>           | Assistant Professor        | Sociology                       | Warren         |
| <b>Zimm, Bruno H.</b>         | Professor                  | Chemistry                       | Revelle        |
| <b>ZoBell, Claude E.</b>      | Professor Emeritus         | SIO                             | SIO            |
| <b>Zuker, Charles</b>         | Assistant Professor        | Biology                         | Revelle        |
| <b>Zweifach, Benjamin W.</b>  | Professor Emeritus         | AMES                            | Warren/SchMed  |





# COURSES, CURRICULA, AND PROGRAMS OF INSTRUCTION

## KEY TO COURSE LISTINGS:

Courses numbered 1 through 99 are lower-division courses and are normally open to freshmen and sophomores.

Courses numbered 100 through 199 are upper-division courses and are ordinarily open only to students who have completed at least one lower-division course in the given subject, or six quarters of college work.

Courses numbered 200 through 299 are graduate courses and are ordinarily open only to students who have completed at least eighteen upper-division units basic to the subject matter of the course.

Sample Course Listing:

**100 (see above) Title of Course (4) (number of quarter hours or units of credit)**

Course Description. Prerequisites: [listed]. (F) [Quarter the course is taught].

## ACADEMIC INTERNSHIP PROGRAM

OFFICE: Building 406, Matthews  
Administrative and Academic Complex

### The Program

The Academic Internship Program (AIP) offers juniors and seniors, in any college at UCSD, the opportunity to earn academic credit while working full- or part-time in an off-campus placement. Placements are designed to match students' major areas of academic study and to correlate with their career goals.

Internships are available in a wide variety of settings: TV and radio stations, law firms, medical research labs and clinics, government agencies, high-tech companies, engineering firms, business organizations, and numerous other fields. Students can also work with the internship office to set up their own placements.

Although most placements are in San

Diego County, the AIP provides internships in Washington, D.C. and Sacramento with congressional and government offices, consumer interest groups, and media organizations. UC-sponsored housing is available in Washington, D.C.

In an internship, students can work from ten to forty hours a week for one or more quarters. They can earn a maximum of sixteen units of credit which may be taken in increments of four, eight, or twelve units per quarter. Internships are available in the summer as well as during the academic year.

A faculty adviser oversees the academic component of the internship, which consists of writing a research paper/project. The faculty adviser may also choose to assign relevant readings.

The Academic Internship Program is a valuable form of professional training which provides students the opportunity to test their career interest in an off-campus setting.

Students planning an academic internship should apply to AIP at least one quarter before they wish to be enrolled in the program. Students have the option of undertaking one or more academic internships during their junior or senior year. Students must have completed ninety units, including some upper-division course work, and have at least a 2.5 G.P.A. at the date of application.

### 197. Academic Internship Program (4-12)

Individual placements for field learning which are integrated with academic programs will be developed and coordinated by the program. A written contract involving all parties will include learning objectives, a project outline, and means of supervision and progress evaluation, and must be received prior to the preenrollment period. Prerequisites: consent of instructor and submission of a written contract.

## AFRO-AMERICAN LITERATURE

See Literature.

## ANTHROPOLOGY

OFFICE: 8004 Humanities and Social Sciences Building, Muir College

### Professors:

F. G. Bailey, Ph.D.  
Roy G. D'Andrade, Ph.D.  
David K. Jordan, Ph.D.  
Robert I. Levy, M.D.  
Michael E. Meeker, Ph.D.  
Theodore Schwartz, Ph.D.  
Melford E. Spiro, Ph.D.  
Marc J. Swartz, Ph.D.  
Donald F. Tuzin, Ph.D. (*Chairman*)

### Associate Professors:

Fitz John P. Poole, Ph.D.  
Shirley C. Strum, Ph.D.

### Assistant Professor:

Stanley G. Walens, Ph.D.

### Associated Faculty:

Susan G. Davis, Ph.D., *Assistant Professor, Department of Communication*  
Lawrence A. Palinkas, Ph.D., *Assistant Adjunct Professor, Community and Family Medicine*  
Lola Romanucci-Ross, Ph.D., *Professor, Community and Family Medicine, UCSD School of Medicine*  
Robert C. Westerman, Ph.D., *Associate Librarian*  
Edwin L. Hutchins, Ph.D., *Research Scientist: Cognitive Science*

Anthropology, is a humanistic social science dedicated to understanding how the diversity of cultural traditions and social institutions issues from frameworks of behavior and experience which all peoples have in common. With the increasing awareness of the importance of sociocultural factors in domestic and international relations, a bachelor's degree in anthropology has become accepted as a valuable preparation for careers in law, medicine, education, business, government,

## ANTHROPOLOGY

and various areas of public service. At UCSD, the concentration is on cultural, social, and psychological anthropology, with theoretical emphasis on such topics as religion, identity, social systems, politics, the family, and — to an extent that is unusual among anthropology departments — cognitive and personality psychology. Courses are also available in primatology and physical anthropology. Courses utilize a comparative perspective, drawing on materials from a wide variety of cultural settings throughout the world. Some courses also focus on specific societies or parts of the world. The department offers undergraduate minor and major programs, a senior thesis program, an undergraduate internship program, and a graduate program leading to the doctoral degree.

### The Undergraduate Program

#### Lower Division

Lower-division offerings in anthropology are concentrated mainly in two series of courses, AN 10, 11, 12 and AN 22, 23, and 24. Collectively, any three of the courses offered in the same year in the same series are designed to provide a comprehensive orientation to the ideas and methods of anthropological investigation and a familiarity with case materials from a number of different societies. The colleges differ in which combinations constitute a "sequence" for purposes of filling college requirements. Consult your provost's office for the rules that currently apply to your college. Students who anticipate majoring in anthropology are particularly advised to take AN 22, which is the prerequisite for most upper-division courses offered by the department.

Students who have already completed AN 105, 106, and 107 may not receive academic credit for AN 22.

Other lower-division courses are offered from time to time and will vary from year to year.

#### The Minor

Students may choose either a general anthropology minor or a minor in biological anthropology. Each consists of six anthropology courses. At least three courses must be upper-division; at least three should be taken at UCSD. The list of courses offered for each minor is available from the department. Transfer credits from other anthropology departments are usually accepted. Education Abroad Program credits are acceptable at the discretion of the undergraduate adviser.

#### The Major

To receive a B.A. degree with a major in anthropology, the student must meet the requirements of Revelle, Muir, Third or Warren College, including the following requirements of the Department of Anthropology:

1. A minimum of twelve upper-division courses in the Department of Anthropology must be completed.
2. AN 105, 106, and 107 must be completed (included as three of the twelve courses required under No. 1, above). All or some of the courses in this sequence are prerequisites for some other upper-division courses. This sequence consists of:  
105 Social Anthropology  
106 Cultural Anthropology  
107 Psychological Anthropology
3. No courses taken in fulfillment of the above requirements may be taken on a Pass/Not Pass (P/NP) basis. (An exception is made for some courses accepted from other schools and for one independent study course (199) and one directed group study course (198). However, this exception does not extend to AN 105, 106 and 107, or to transfer credits accepted in lieu of them. These **must** be taken for a grade.)
4. For the B.A. degree, a minimum average of 2.0 (C) is required, both as an overall average in all anthropology courses and in the AN 105-106-107 sequence considered separately.
5. Majors will be required to have at least seven of their twelve anthropology courses at the University of California, San Diego. The seven normally must include AN 105, 106, and 107. A transfer course may be accepted in lieu of one of these "core" courses if in the opinion of the undergraduate adviser the content is substantially the same. In no case will transfer credit be accepted in lieu of more than one of these courses.
6. Majors are required to obtain a background in basic statistical techniques. Social Science 60 is recommended as one way of fulfilling this requirement.

#### (Optional) Departmental Senior Thesis Program

The senior thesis is prepared during three successive quarters of AN 196: Thesis Research (counted as part of the student's twelve required courses). The thesis will be evaluated by a committee

consisting of the thesis adviser and one other faculty member (or, in event of disagreement, two other faculty members) appointed by the director of the program. The thesis adviser has sole responsibility for the grades the student receives in the three quarters. The reading committee decides whether the thesis merits departmental honors. Students are admitted to the program by approval of the anthropology faculty. Under normal circumstances eligibility for the program requires that the student (1) complete eight upper-division anthropology courses by the end of the junior year, three of which must be the "core" sequence and (2) achieve grade-point averages of at least 3.6 (overall) and 3.6 (anthropology) by the end of the junior year. Interested students should apply to the department's undergraduate adviser by the end of the sixth week of the quarter prior to advancement to senior standing.

#### Internship Program

The department sponsors an internship program that allows students to gain academic credit for supervised work in the Museum of Man, the San Diego Zoo, or the Wild Animal Park. The three tracks of the program allow internship experience in (1) physical anthropology, or (2) ethnology and archaeology at the museum, or (3) in primate behavior and conservation at the zoo or Wild Animal Park. A combination of on-campus and on-site supervision makes these courses intellectually provocative but practical and applied. They are an especially valuable complement to a major or minor in anthropology. Applications to these programs are accepted during the first seven weeks of the quarter before the one in which the internship is to be done.

#### The Graduate Program

The Department of Anthropology offers graduate training in social, cultural, and psychological anthropology. The graduate program is designed to provide the theoretical background and the methodological skills necessary for advanced research in the study of society and culture, for a career in teaching anthropology at the university level, and for the application of anthropological knowledge to contemporary problems. It is assumed that all students enter with the goal of proceeding to the doctoral degree.

Admission to the graduate program occurs in the fall quarter only, save by special waiver.

## Graduate Advising

One member of the departmental faculty functions as the graduate adviser. The role of graduate adviser is to inform students about the graduate program, approve individual registration forms, and give assistance with respect to administrative matters. After completion of the requirements for the master's degree, the chairperson of the student's doctoral committee serves as the student's major adviser.

## THE MASTER OF ARTS DEGREE

Students entering the doctoral program must complete a master's degree before continuing toward the doctorate. Entering students who already have a master's degree in anthropology are not permitted by university regulations to receive a second master's degree, but are required by the department to complete the requirements for the master's degree.

### Requirements for Master's Degree

#### 1. Specific Courses:

280A-B-C: Core Seminars  
(four units each)

281: Introductory Seminar (four units)

282: Ethnological Issues (four units)

230A: Departmental Colloquium (four quarters, one unit each)

261: Bibliographic Resources in Anthropology (one unit)

295: Master's Thesis Preparation (one-twelve units)

500: Apprentice Teaching (two quarters, one-four units each)  
(See below, "Teaching.")

2. Students must take four elective seminars in the department from at least three different faculty members. Required courses may not be counted as elective seminars.

#### 3. The Master's Thesis

Upon completion of the specific courses and four elective seminars, the student may be advanced to master's candidacy (normally at the end of winter quarter of the second year). Upon advancement to master's candidacy, a master's thesis committee of three faculty is appointed by the dean of Graduate Studies. The thesis, normally written during the spring quarter of the second year, must be approved unanimously by the student's master's thesis committee and accepted by the University Librarian.

## THE DOCTORAL DEGREE

Admission to the doctoral portion of the program is open to students who have satisfactorily completed the master's program, and who have completed courses and the master's thesis at a level of excellence which indicates promise of professional achievement in anthropology.

### Requirements for the Doctoral Degree

#### 1. Required Courses

In addition to the courses required in the master's program, students are required to complete three additional elective seminars plus Anthropology 283: Ethnographic Fieldmethods or the equivalent in independent study directed by the student's doctoral committee.

#### 2. Quantitative Methods

Students are required to demonstrate competency in quantitative methods by examination.

#### 3. Foreign Language

Knowledge of one foreign language is required for a doctoral degree. A student planning fieldwork in English-speaking areas is required to pass a departmental examination in a foreign language. The language submitted for examination must receive prior approval by the student's departmental committee. The exam is administered by a member of our faculty appointed by the department chairperson, and consists of an oral translation of part of an anthropology article into English. A student planning fieldwork in a non-English-speaking area is required to submit a written plan describing (1) the linguistic affiliations of the language(s) to be used in fieldwork, (2) the training necessary to attain a level of proficiency adequate for fieldwork in the language(s), and (3) the student's present proficiency. If the student's proficiency is less than that needed, the plan should also describe (4) reasonably available facilities for studying the language(s), and (5) procedures which the student has followed or will follow to attain the necessary proficiency. The written plan is a requirement for Ph.D. candidacy, but proficiency itself is a requirement for the Ph.D. degree. Successful completion of a dissertation based on fieldwork using the language of the plan is accepted as evidence of successful mastery of the language.

#### 4. Formation of the Doctoral Committee

Students are expected to select the chairperson of their doctoral committee before

registration for the winter quarter of the third year. The chairperson of the doctoral committee serves as the student's adviser for the remainder of the student's program. In consultation with the chairperson of the doctoral committee, two more departmental committee members are selected, and two additional faculty members from outside the department. The final composition of the committee must be approved by the Office of Graduate Studies.

#### 5. Prefield Qualifying Examination

After completion of the above requirements, the student stands for the doctoral qualifying examination, as required by the Office of Graduate Studies and Research. This examination may contain questions on any aspect of anthropology, but focuses particularly upon the merits of the student's field research proposal (see below). Successful completion of this examination marks the student's advancement to doctoral candidacy.

### The Fieldwork Proposal

After admission to the doctoral portion of the program, each student prepares a dissertation research proposal to serve as the basis of the prefield oral qualifying examination. The dissertation research proposal sets forth a specific plan of research, normally involving intensive fieldwork. AN 296A,B provide an opportunity for the development of such a proposal. Students typically begin these courses in the fall of their third year to allow the fieldwork proposal to be developed in connection with the deadlines of external fieldwork funding agencies.

When the proposal is informally judged by committee members to be ready to be defended the oral qualifying examination is scheduled. The oral qualifying examination is administered by the student's full doctoral committee. At least two weeks must elapse between the appointment of the doctoral committee and the qualifying examination.

A copy of the student's field research proposal must be in the hands of all doctoral committee members ten days before the oral qualifying examination and a one-page abstract distributed to all members of the faculty. Fieldwork proposals do not normally exceed twenty double-spaced typed pages, plus abstracts. Graduate students may not use department personnel or services to make copies of prefield proposals, dissertations, or dissertation abstracts.

## 6. Dissertation and Dissertation Defense

Upon completion of the dissertation research project, the student writes a dissertation which must be successfully defended in an oral examination, conducted by the doctoral committee, and open to the public. A resume of the student's dissertation must be in the hands of all faculty members ten days before the dissertation hearing. A full copy of the student's dissertation must be in the hands of each of the student's doctoral committee members four weeks before the dissertation hearing. It is understood that the edition of the dissertation given to committee members will not be the final typing, and that the committee members may suggest changes in the text at the defense. This examination may not be conducted earlier than three quarters after the date of advancement to doctoral candidacy. Revisions may be indicated, requiring this examination to be taken more than once. Acceptance of the dissertation by the University Librarian represents the final step in completion of all requirements for the Ph.D.

## Evaluation

An evaluation is made by the faculty in the spring quarter of the student's first year, and at the end of the winter quarter of the student's second year to determine whether the student should continue in the program, based on the student's performance in seminars and other course work. A written progress assessment is given to the student after each evaluation to help the student assess his or her progress.

## Teaching

In order to acquire teaching experience, each student in the graduate program is required to participate as an assistant in the teaching activities designated by the department during one quarter in each of the student's first three years of residence. This obligation is discharged under the auspices of the course entitled "AN 500: Apprentice Teaching."

Any decision to waive a requirement for either the master's degree or the Ph.D. must be made by the full faculty.

Only one 290-level course may be taken in any one quarter until a student attains Ph.D. candidacy. Students are encouraged to take an independent study course taught within a tutorial framework prior to the master's exam.

## Introduction to Required Courses

**AN 280A-B-C: Core Seminars in Anthropology.** This sequence of seminars constitutes the foundation of the first year of graduate study. These seminars are concerned with both contemporary and historical problems in cultural, social, and psychological anthropology. Each seminar will focus upon a series of significant debates concerning anthropological theory and data.

**AN 281: Introductory Seminar.** This seminar is held in the first quarter of the first year of graduate study. Faculty members will present an account of their current research and interests. When appropriate a short preliminary reading list will be given for the particular lecture. In addition there will be readings (mainly but not exclusively of books or essays produced by the speakers). Two weeks will be set aside for integrating discussion.

**AN 282: Ethnological Issues.** An examination of special anthropological issues and problems which have arisen out of ethnographic work in particular regions of the world, e.g., the "potlatch" of the Pacific Northwest, the "cargo cults" of Melanesia, etc. Issues will vary from year to year.

**AN 283: Ethnographic Field-methods.** An opportunity to use several main fieldmethods of social and cultural anthropology and to discuss their strengths and problems. Includes the genealogical method, various types of interviewing and observation, oral history, and maintenance of fieldnotes and indexes.

## The Melanesian Studies Resource Center and Archive

This new venture recognizes the substantial interests in the Pacific Basin that are represented on the UCSD campus and the special prominence of the UCSD Department of Anthropology in the study of cultures and societies of Oceania and especially of Melanesia. In cooperation with the UCSD libraries, the Melanesian Studies Resource Center and Archive has two major projects. First, there is an ongoing effort to create a library collection of monographs, dissertations, government documents, and journals on Melanesia that will make UCSD the premier center for such materials in the United States. This collection is being built upon the already significant library strengths in Pacific studies. Second, there is a new endeavor to collect the extremely valuable unpublished literature on Melanesia, to

catalog such materials systematically, to produce topical bibliographies on these holdings, and to provide microfiche copies of archival papers to interested scholars and to the academic institutions of Melanesia. This innovative archival project may become a model for establishing special collections on the traditional life of tribal peoples as dramatic social change overtakes them. In the near future, anthropological research on tribal peoples will take place largely in archives of this kind. These complementary collections will support a variety of research and teaching activities and are already attracting students of Melanesia to this campus. These undertakings are presently supported by a grant under Title II of the Higher Education Act. All students who are interested in the work of the Melanesian Studies Resource Center and Archive should contact Fitz John Poole or Donald Tuzin of the Department of Anthropology, who are the co-directors of these projects.

## Courses

NOTE: For specific course offerings, check the *Schedule of Classes* issued fall 1987, winter 1988, and spring 1988.

### Lower Division

**10. Human Origins: Human Evolution (4)**  
(Formerly AN 25) An introduction to human evolution from the perspective of physical anthropology, including evolutionary theory and the evolution of the primates, hominids, and modern man. Emphasis is placed on evidence from fossil remains and behavioral studies of living primates.

**11. Human Origins: Archaeological Anthropology (4)**  
(Formerly AN 26) An introduction to the history of human culture from the Neanderthals through the growth of Bronze Age empires, focusing on major cultural inventions such as agriculture, medicine, metallurgy, and writing and on responses to environment and population growth.

**12. Human Origins: Evolution of Society (4)**  
An introduction to theories of sociocultural evolution, with emphasis on the differences in human experience in the transition from hunting and gathering societies through tribal societies to the world of the modern state.

**13. Leadership and Order in Non-Western Societies (4)**  
An anthropological perspective on the means by which activities are coordinated and cooperation made possible in societies quite different from those of the urban, industrial West. Attention will be directed to conflict and its social management as well as to legitimacy and its sources.

**21. The Individual and Society (4)**  
This course explores various ways in which life in different communities influences individuals as revealed in anthropological studies. Such matters as learning, personality formation; shame and guilt; stress, breakdown, and healing will be considered.

**22. Cultural Anthropology: Introduction (4)**  
An introduction to the anthropological approach to understanding human behavior, with an examination of data from a selection of societies and cultures.



**23. Cultural Anthropology: Society (4)**

A cross-cultural perspective on the means by which human activities are socially organized and coordinated. Topics include legitimacy, conflict, and strategizing.

**24. Cultural Anthropology: Symbols (4)**

The study of how individuals use symbolic representations to understand their world, with emphasis on the ways in which symbols are constructed and on their social and psychological functions.

**30. Indigenous Peoples of North America (4)**

An introduction to the cultures of native North America, their histories, institutions, and beliefs. (The particular cultures under discussion and topical focus may change from year to year.)

**31. Peoples of South Asia (4)**

An introduction to the cultural beliefs and social systems of South Asia, with particular reference to India.

**32. Traditional China (4)**

A description and interpretation of the major institutions and culture patterns of traditional China.

**33. Africa: Peoples and Cultures (4)**

The focus of the course is on the richness and variety of African cultures with attention to their history and to the physical setting. Students will be presented with a general overview and a detailed examination of a small sample of societies.

**42. The Study of Primates in Nature (4)**

Some of the major primate field studies will be selected for study to illustrate common features of primate behavior and behavioral diversity within the order. Topics will include mother-infant relations, communication, female hierarchies, proto-cultural behavior, social learning and tool use, play, cognition and self-awareness. Field study materials will be presented in lecture, slides, and films.

**Upper Division**

**100. In Search of Ourselves (4)**

An approach to understanding human behavior through the investigation of the social behavior of living monkeys and apes. Historical review of primate studies with emphasis on changes in interpretation of social patterns. *Prerequisite: AN 10 or 25.*

**101. Human Social Behavior: The Evidence from Animals (4)**

An overview of theories of animal social behavior with attention to new developments in primate behavior. Evaluation of current popular books on human behavior. *Prerequisite: AN 10 or 25.*

**103. Chinese Popular Religion (4)**

The religious world of ordinary Chinese of precommunist times, with some reference to major Chinese religious traditions. Particular emphasis on the relation between popular religion and other aspects of Chinese personality or culture. Background in anthropology or Chinese studies desirable. *Prerequisite: AN 22 or introductory anthropology at another university.*

**104. Traditional African Societies and Cultures (4)**

Attention to three main sociopolitical types of societies: egalitarian hunting and gathering groups; loosely organized agricultural and herding groups; and centrally organized kingdoms. Representatives of all three types considered and societies from all parts of sub-Saharan Africa studied intensively.

**105. Social Anthropology (4)**

A systematic analysis of social anthropology and of the concepts and constructs required for cross-cultural and comparative study of human societies. *Prerequisite: AN 22 or introductory anthropology at another university.* (Required for major in anthropology.)

**106. Cultural Anthropology (4)**

A web of problematic meanings lies behind social relationships and institutional frameworks. This perspective has come to play an important role in the discussion of human affairs since the last century. The course considers the concept of culture in anthropology as a particularly forceful statement of such a perspective. *Prerequisite: AN 22 or 105,*

*or introductory anthropology at another university.* (Required for major in anthropology.)

**107. Psychological Anthropology (4)**

This course considers the interrelationships of aspects of both individual personality and sociocultural systems. Emphasis will be placed on the relation of sociocultural contexts to motives, values, cognition, personal adjustment, stress and pathology, and to qualities of personal experience. *Prerequisites: AN 22 or 105, and 106.* (Required for major in anthropology.)

**108. Peasant Organization and Conflict (4)**

A study of peasant social and political movements with emphasis on the effects of village organization and the relations between village and urban society.

**109. Chinese Familism (4)**

This course explores the ethnography of family life in pre-communist and noncommunist China and the theoretical issues raised by Chinese familism for our understanding of family life in general and for other aspects of Chinese culture.

**110. Perspectives on Human Evolution (4)**

This is a special seminar for students who wish to explore advanced topics in physical anthropology. The course focus will change year to year. May be repeated one time for credit. *Prerequisites: AN 10 or 25, or 100 and one other course in physical anthropology, and consent of instructor and department stamp.*

**111. Modernization and Development (4)**

Survey of theories of social and economic change. Social and economic consequences of technological innovation. The evolution of modern industrial society and its contemporary dilemmas. Application of anthropological theory to case studies of the transformation of rural economy and society. *Prerequisite: AN 22 or introductory anthropology at another university.*

**113. Applications of Anthropology: Wildlife Research, Conservation and Education, the Role of Zoological Parks (4)**

Wildlife conservation is a growing concern as increasing numbers of wild animals and natural habitats face extinction. Zoological parks are trying to meet conservation needs in several ways: improved public education, breeding endangered species in captivity, reintroducing species preserved in captivity to their natural environment. This course will introduce some of the critical issues in wildlife conservation and assess the future direction programs may take. *Prerequisites: upper-division standing and consent of instructor.*

**114. Family, Childhood, and Society (4)**

A comparative and analytic study of the relationships between family structure and childhood experience, and their effects on social and cultural systems.

**115. Marriage and the Family in Cross-Cultural Perspective (4)**

Sources of power, types of relationships including division of labor and the allocation of authority and the means whereby spouses, parents and children, and siblings seek goals in their relations with one another will be examined in a variety of societies, including the U.S.

**118. Cognitive Anthropology (4)**

This course will explore the relation between culture and cognition. Topics to be covered include cultural influences or belief systems, reasoning, perception, and motivation. The teaching style for the course is discussion and lecture, with simple classroom demonstrations. No prerequisites.

**121. Women in Cross-Cultural Perspective (4)**

A comparative and analytic study of the ways women function in a variety of settings. Particular attention will be given to the cultural aspects of women's roles. *Prerequisite: AN 22 or introductory anthropology at another university.*

**124. Sex, Love, and Culture (4)**

This course will deal with cultural and psychological factors in sexual behavior and sex-related roles both within and beyond the social context of the family. The course will have an evolutionary and cross-cultural perspective. The symbolic elaboration of sex and the replacement of "arranged" with "love" relationships will also be explored. *Prerequisite: AN 22 or introductory anthropology at another university.*

**126. Cultures of Native North America (4)**

The ethnology of North American tribes from traditional times to the present. *Prerequisite: AN 22.*

**128. The Anthropology of Medicine (4) (Same as Cont. Issues 136)**

Theoretical approaches to and cross-cultural analyses of the role of the medical profession, the sick and the healers, and culture as communication in the medical event. The theoretical anthropological aspects of medical practice and medical research will include a consideration of the "Great Tradition" of medicine as well as primitive and peasant systems. Western medicine will be considered in the foregoing framework with issues of contemporary concern by way of introduction. *Prerequisite: upper-division standing.*

**129. Female, Male, and Gender: The Cultural Shape and Social Force of Sexual Difference (4)**

This course explores how sexual differences are culturally constructed, and how such gender constructs become socially significant in various domains of community life and psychologically significant in the formation of personal identity. Both anthropological and feminist studies are examined. *Prerequisite: AN 22 or equivalent introductory course at another university.*

**130. Economic Anthropology (4)**

This course will examine the nature of economic systems in preindustrial societies from the standpoint of anthropological theory and development planning. *Prerequisite AN 22 or introductory anthropology at another university.*

**131. Culture Change and Applied Anthropology (4)**

No cultures today are isolated and unchanging. This course offers theory and case studies in cultural evolution, continuity, and change. On this base several applied fields of anthropology will be examined both as to method and the ethics of cultural intervention. *Prerequisite: AN 22 or consent of instructor.*

**134. The Cultures of Mexico (4) (Same as Cult. Trad. 134)**

Various aspects of the multiple cultures of Mexico from the anthropological perspective will include field studies by anthropologists focusing on changing emphases in investigative style and analyses, peasant communities, *ejidos*, studies of elites, indigenous "Indian" cultures, and culture change.

**135. Indian Society (4)**

A study of the social structure of India, with particular reference to caste and political organization. *Prerequisite: upper-division standing.*

**136. Culture and Personality in China (4)**

General introduction to traditional (pre-Communist) China, with special attention to popular culture and local-level social structure seen in relation to personality formation and value orientations. Background in anthropology or Chinese studies is desirable.

**137. Societies and Cultures of Melanesia (4)**

Consideration of the history and development of Melanesia and of selected societies within that area of the Pacific with particular reference to the cultures and social structures which have developed in that area. *Prerequisite: AN 22 or introductory anthropology at another university.*

**140. The Creation and Communication of Meaning (4)**

This course will consider the ways in which different communities structure, symbolize, teach, and communicate a meaningful world out of the flow of events and sensations. Aspects of learning, symbolism, ritual and myth, and meaningful form will be considered. *Prerequisite: upper-division standing.*

**141. Religion and Society (4)**

A comparative study of religion as a cultural system. The analysis will focus on the relationship between religion and its social and psychological determinants, and its social and psychological functions. Materials are drawn from Western and non-Western, primitive and high religions alike. *Prerequisite: AN 22 or introductory anthropology at another university.*

**147. Ritual and Symbolism (4)**

An examination of the place of symbols in the ritual systems of large and small-scale societies, and a critical evaluation of theoretical models commonly applied to their analysis and interpretation. *Prerequisite: AN 22 or introductory anthropology at another university.*

## ANTHROPOLOGY

### 149. Hinduism (4)

This seminar will consider Hinduism from an anthropological and psychological perspective, with an emphasis on the Tantric Hinduism of Nepal. The seminar is restricted to students with an interest in the sociological, historical, and doctrinal aspects of Hinduism in their relationship to Asian Hindu communities. *Prerequisites: instructor's approval and department stamp required.*

### 150. Culture, Communication, and Meaning (4)

An examination of elements of systems of meaning — their acquisition, communication, and pathology in anthropological perspective. *Prerequisite: AN 22 or equivalent.*

### 151. Political Anthropology (4)

An examination of the political processes at the local level with emphasis on examination of supports for various aspects of the processes considered (e.g., leadership, factionalism, etc.). *Prerequisite: AN 22 or introductory anthropology at another university.*

### 153. History of Anthropology (4)

An overview of the development of anthropology with particular emphasis on developments centering around the concepts of "culture," "society," and "personality." *Prerequisite: previous upper-division work in anthropology.*

### 155. Models of Madness: Problems in Ethnopsychiatry (4)

This course explores selected problems of psychiatric etiology, symptomatology, and classification; diagnosis and labeling; prognosis; and therapy — with special attention to the interrelationships of cultural, psychological, and social factors. Emphasis is given to the psychocultural features of illness phenomena. *Prerequisite: AN 22 or introductory course in anthropology at another university.*

### 156. Kinship and Descent (4)

This course reviews the approaches of British, French, and American anthropology to the subjects of kinship and descent, while also incorporating the relevant findings of behavioral biology and developmental psychology. *Prerequisite: AN 22 or equivalent.*

### 157. Culture, Deviance, and Psychopathology (4)

A consideration of the relationship between culture and the definition of, responses toward, and forms of deviant behavior and psychopathology. *Prerequisite: AN 22 or consent of instructor.*

### 158. Psychoanalytic Anthropology (4)

A critical examination of the anthropological works of Freud and of selected Freudian anthropologists and an assessment of their influence on anthropological theory. *Prerequisites: upper-division standing; AN 22 or consent of instructor.*

### 161. Human Origins (4)

The study of human evolution is complex; the interpretation of fossil material, its morphology, variation, phylogenetic relationships, the reconstruction of ecological settings and cultural patterns of early human life, demands the integration of many disciplines. Lectures cover major stages of human evolution, time ranges, distribution, archaeology, distinctive morphology and major problems in their study today. *Prerequisite: AN 22 or introductory anthropology at another university.*

### 162. Peoples of the Near East (4)

An introduction to the social and political traditions of the tribal and peasant peoples of the Near East. Some attention will be devoted to an interpretation of the oral literature of these peoples as a means for understanding these traditions. *Prerequisite: one course in anthropology here or elsewhere.*

### 166. Family and Society in the Near East (4)

An introduction to the historical and sociological study of societies with Islamic traditions and a discussion of the social and political problems associated with such societies. *Prerequisite: AN 22 or introductory anthropology at another university.*

### 169. Art and Artist in Traditional Society (4)

An introduction to the creative arts — visual, verbal, choreographic, dramatic, and ritual in traditional societies. The course will cover principles of aesthetics, ethnopoetics, theories of performance, and the social context of the arts, using ethnographic materials from various cultures around the world. *Prerequisite: AN 22 or equivalent at another university.*

### 170. Language and Culture in Asia (4)

Introduction to anthropological thinking about the relationships between language, culture and society, including the use of "language models" in other areas of anthropology. Examples will be taken largely from Asia and the Pacific Basin. *Prerequisite: AN 22 or equivalent at another university or consent of instructor.*

### 172. Cultural Study of Interpersonal Behavior (4)

A variety of approaches to the study of interpersonal behavior will be examined, with an emphasis on the way in which interpersonal behavior is perceived and understood. Videotape and other recording techniques will be employed. *Prerequisite: AN 22 or introductory anthropology at another university.*

### 173. The Issues of Consciousness in Animals and Humans (4) (Same as Frontiers of Science 140)

This course strives to look at the issue of consciousness as it has been modified by recent advances in several disciplines. Using a comparative perspective, the evidence from animal behavior raises interesting questions about what consciousness is, the uniqueness of human consciousness, and the characteristics that are a part of the animal-human continuum. The course would draw from faculty expertise in several departments. *Prerequisite: AN 10 or 25 or any introductory course in evolution/animal behavior or consent of instructor.*

### 174. Folk Culture and Popular Culture (4)

Cultural performances, such as stories, songs, spectacles, and carnivals, sometimes reveal broad patterns of personal and social experience. In this course, the similarities and differences of cultural performances in face-to-face societies and modern industrial societies will be considered. *Prerequisite: One lower-division or upper-division course in anthropology.*

### 177. Anthropological Research Methods (4)

This course surveys selected research methods used by anthropologists in small-scale societies and communities, and includes non-directive interviewing, life histories, participant observation, and the ethics and pitfalls of fieldwork. Students will be assigned various field projects. *Prerequisites: AN 22 and upper-division standing.*

### 178. Healing Arts in Cultural Perspective (4) (Same as Cont. Issues 140)

We review medical systems in a broader cultural base and their transformation in acculturation, e.g., empirical analysis of non-Western medical practices, social structure and ritual in biomedicine, symbols and healing, psychiatry and its problematics in transcultural application. *Prerequisite: upper-division standing.*

### 179. Holocultural Analysis (4)

This course introduces the Human Relations Area Files as a means of accessing the ethnographic record. Emphasis is on holocultural analysis, i.e., the evaluation of anthropological theories by use of uniform data from statistically balanced samples of human societies. *Prerequisites: two or more upper-division anthropology courses.*

### 180. The Culture of Children (4)

This course explores the interrelationships of cultural, psychological, and social aspects of socialization and enculturation with respect to contemporary views of child development in psychological anthropology. Emphasis is given to examining the cultural world of children's experience. *Prerequisite: AN 22 or introductory course at another university.*

### 181. Northwest Coast Indians (4)

The peoples of the Northwest Coast of North America are famed both for their sophisticated art and myth and for the elaborate social structures that developed based on a hunting and gathering economic base. This course presents an ethnographic survey. *Prerequisite: AN 22 or introductory anthropology at another university.*

### 182. The Anthropological Study of Myth (4)

Myth, viewed as part of a particular cultural repertoire or in cross-cultural perspective, is a major source of information about human culture and psychological systems. This course examines different approaches to the analysis of mythological materials. *Prerequisite: AN 22 or introductory anthropology at another university.*

### 187A. Intern Seminar in Physical Anthropology (2)

This intern seminar is designed to complement students' research experiences in the Academic Internship Program in physical anthropology at the San Diego Museum of Man. Structured readings and discussions will focus on the anatomy, pathology, and classification of skeletal remains and x-ray analyses of skeletal materials. Research paper is required. *Prerequisites: AN 10 or 25 and simultaneous enrollment in Warren 197, Physical Anthropology-Museum of Man. Department stamp required.*

### 187B. Intern Seminar in Ethnography and Archaeology (2)

This intern seminar is designed to complement students' research experience in the Academic Internship Program in ethnography and archaeology at the San Diego Museum of Man. Structured readings and discussions will focus on problems in the analysis of material culture and analysis of classifications of artifacts and site excavations. Research paper is required. *Prerequisites: AN 106 and simultaneous enrollment in Warren 197, Ethnography Archaeology-Museum of Man. Department stamp required.*

### 187C. Intern Seminar in Ethology (2)

This intern seminar is designed to complement students' research experience in the Academic Internship Program in ethology at the San Diego Wild Animal Park and/or the San Diego Zoo. Structured readings and discussions will focus on problems of analysis in the observational study of animal behavior and human behavior (in relation to animals) and problems of wildlife management and conservation in relation to ethological studies. Research paper is required. *Prerequisites: AN 10 or 25 and one upper-division course in animal behavior, either in anthropology or biology. To qualify, must be last quarter junior or senior with a 3.3 G.P.A. Simultaneous enrollment in Warren 197; Ethology Zoo. Department stamp required.*

### 189. Zionism as a Social Movement (4)

This seminar examines the ideological and social bases of the Zionist idea, and the role of the Zionist movement in the Jewish settlement of Palestine, the formation of the state of Israel, and Arab-Jewish relations. *Prerequisites: upper-division standing and department stamp required.*

### 191. Seminar in Medical Anthropology (4)

Seminar in medical anthropology to go beyond principles learned in introductory course: to examine theory and method in the analysis of studies and research projects through surveying the literature and clinical situations (medical anthropological writings, medical grand rounds, epidemiology). *Prerequisite: AN 128/C.I. 136 or AN 178/C.I. 140 or consent of the instructor. Department stamp required.*

### 196. Thesis Research (4)

Independent preparation of a senior thesis under the supervision of a faculty member or committee. Temporary fall and winter quarter grades of I/P will be assigned. Final letter grade for all three quarters will be given in spring quarter based on thesis. May be repeated for credit two times. *Prerequisite: students will be admitted by invitation of the department. Department stamp required.*

### 197. Field Studies (4)

Individually arranged field studies giving practical experience outside the university. *Prerequisites: consent of instructor and department approval. (P/NP grades only.) Department stamp required.*

### 198. Directed Group Study (2-4)

Directed group study on a topic or in a field not included in the regular departmental curriculum by special arrangement with a faculty member. *Prerequisites: consent of instructor and upper-division standing. (P/NP grades only.) Department stamp required.*

### 199. Independent Study (2-4)

Independent study and research under the direction of a member of the staff. *Prerequisite: special permission of instructor. (P/NP grades only.) Department stamp required.*

## Graduate

### 201. Techniques and Methods in Psychological Interviewing (4)

An introduction to a wide range of techniques leading to psychological inferences about groups and individuals in cross-



cultural research. Includes depth interviewing and observation. *Prerequisite: graduate standing in anthropology.*

**202. Cultural Belief Systems: Rationality and Relativism (4)**

This course explores selected problems in anthropology, cognitive psychology, and philosophy that converge in analytic assessments of the "logic" of cultural belief systems as theoretical constructions. *Prerequisite: graduate standing in anthropology.*

**204. Applied Anthropology (4)**

This seminar will deal concretely with the application of anthropological theory and method to issues of public policy and public concern. It will particularly deal with the role of the anthropologist in such settings and the ethical concerns of applied social science. *Prerequisite: graduate standing.*

**214. Quantitative Methods in Anthropology (4)**

This seminar will cover the basic statistical techniques used in the social sciences, as well as selected techniques of multidimensional analysis. Use will be made of computer-based interactive statistical programs, such as minitab.

**217. Current Theoretical Issues in Anthropology (4)**

Discussion and evaluation of theoretical and methodological issues based on selected papers in the current anthropological and related literature. *Prerequisite: completion of first-year graduate program in anthropology.*

**218. Cognitive Anthropology (4)**

This course will consider the relation between cultural behavior and cognitive processes. Selected topics from the fields of ethnoscience, semantic and grammatical analysis, decision making, and belief systems will be discussed. *Prerequisite: graduate standing in anthropology or psychology.*

**219. Computer Applications in Anthropology (4)**

This course will provide an introduction to presently available microcomputer hardware and software, with emphasis on applications of interest to anthropologists. Students will have an opportunity to use several different microcomputer systems. *Prerequisite: graduate standing or consent of instructor. (S/U grades permitted.)*

**222A. Anthropology in Melanesia (4)**

Explores selected aspects of anthropological "theory" in relation to a corpus of Melanesian ethnography and with special attention to "controlled comparison" and to interrelationships of "theory," "ethnographic region," and "single-society studies" within Melanesian ethnography. Individual research is required. *Prerequisite: completion of first year of graduate study in anthropology or consent of instructor. (S/U grades permitted.)*

**222B. Anthropology in Melanesia (4)**

Explores selected aspects of anthropological "theory" in relation to a corpus of Melanesian ethnography and with special attention to "controlled comparison" and to interrelationships of "theory," "ethnographic region," and "single-society studies" within Melanesian ethnography. Individual research is required. *Prerequisite: completion of first year of graduate study in anthropology or consent of instructor. (S/U grades permitted.)*

**222C. Anthropology in Melanesia (4)**

Explores selected aspects of anthropological "theory" in relation to a corpus of Melanesian ethnography and with special attention to "controlled comparison" and to interrelationships of "theory," "ethnographic region," and "single-society studies" within Melanesian ethnography. Individual research is required. *Prerequisite: completion of first year of graduate study in anthropology or consent of instructor. (S/U grades permitted.)*

**228. The Prehistory of Anthropology (4)**

The course will explore topics in the intellectual history of the sixteenth through nineteenth centuries, with emphasis on the ideas which have contributed to the formation of modern anthropology. *Prerequisite: graduate standing or consent of instructor.*

**230A. Department Colloquium (1)**

Forum for presentation of papers by students, faculty, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology at pre-M.A. level.*

**230B. Department Colloquium (1)**

Forum for presentation of papers by students, faculty, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology at pre-fieldwork level (Ph.D. candidacy).*

**230C. Department Colloquium (1)**

Forum for presentation of papers by students, faculty, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology at post-fieldwork level (dissertation write-up level).*

**233. Topics in Chinese Society (4)**

The course will be devoted to a review of current social science research relating to traditional Chinese society. A different theme will be announced for different years.

**234. Dynamics of Culture (4)**

The central issue in this seminar is how culture operates as the basis for social life, and a closely related additional issue is what perspectives of theories allow us to understand both cultural continuity and culture change. Ethnographies will be read to serve as the basis for inferring the views of "culture" taken by the authors as well as reading theoretical statements from cognitive, symbolic, social structural, structural theorists, and personality and culture viewpoints. *Prerequisite: graduate standing.*

**236. Computer Uses in Anthropology (4)**

The techniques of computer programming and the use of operating systems will be covered in course and laboratory work. Problems will be oriented toward anthropological methods of quantitative and linguistic analyses.

**239. Ritual and Religion in Native North America (4)**

A comparative and analytic study of religious systems, thought, and practices in Native North America. A general survey of the varieties of Native American religious thought is combined with in-depth considerations of the religious systems of particular groups. *Prerequisite: AN 126 or graduate standing.*

**243. Anthropology and Folklore (4)**

This course will be concerned with sociological and psychological interpretations of folkloric materials. The approaches of anthropologists, folklorists, and others to this problem will be reviewed. Various kinds of folkloric materials will be examined, and the special problems that they raise will be discussed. *Prerequisite: graduate student standing.*

**245. Anthropological Perspectives on Symbolism and Ritual (4)**

Through a critical review of prevailing anthropological perspectives, this seminar explores the nature of symbols — their social, cultural and psychological dimensions, and their incorporation into ritual performances. *Prerequisite: graduate standing in anthropology or consent of instructor.*

**246. Humans in Evolutionary Perspective (4)**

Human behavior and culture are the result of 60 million years of primate evolutionary history. This seminar will examine the important events in that history with an emphasis on evolutionary processes and adaptive aspects of behavior. *Prerequisite: graduate standing in anthropology.*

**248. Cults and Movements: A Psychocultural Perspective (4)**

This course will approach the study of cults and movements on two levels: 1. the role of cults and movements (religious, ethnic, nationalistic, and ideological) in sociocultural change and genesis; 2. the role and psychological status of individuals mediating between society and culture. *Prerequisite: graduate standing or consent of instructor. (S/U grades permitted.)*

**249. Tantric Hinduism (4)**

This seminar will consider Hinduism from an anthropological and psychological perspective, with an emphasis on the Tantric Hinduism of Nepal. The emphasis is on the symbolic and communicative dimensions of Hinduism and their meanings for community and individual life in Nepal. *Prerequisite: graduate standing in social science or humanities.*

**251. Conflict and Collusion: Some Themes in Political Anthropology (4)**

An examination of political processes at the local level with emphasis on examining supports for various aspects of the processes considered (e.g., leadership, factionalism, etc.).

Readings will stress case studies and theory. *Prerequisites: advanced graduate standing and major in social science.*

**252. Psychocultural Aspects of the Self (4)**

The seminar explores the nexus of notions of self, person, and individual. Special attention is focused on recent developments in anthropology, philosophy, psychoanalysis, and social psychology which articulate aspects of the concept of the self. *Prerequisite: graduate standing.*

**256. Psychological Methods in Field Research (4)**

Research dealing with the relation of cultures and psychology require measures or methods of appraisal of psychological variables. We will survey ways in which such variables have or might be implemented, anticipating needs and means of data analysis. *Prerequisite: second-year anthropology students.*

**258. Selected Topics in Psychoanalytic Theory (4)**

A critical analysis of the psychoanalytic approach to selected topics in anthropology, such as religion, totemism, gender, social character, and symbolism. The topic for each seminar will be posted in advance. *Prerequisite: graduate standing.*

**261. Bibliographic Resources in Anthropology (0-1)**

This course will acquaint students with a wide range of bibliographic sources useful in anthropological research. *Prerequisite: open to graduate students in anthropology and selected undergraduates. (P/INP and S/U grades only.)*

**270. Psychiatry and Anthropology (0-4)**

Introduction to interviewing and diagnostic techniques in psychiatry and their application to anthropological research. Content will vary from quarter to quarter. Course will be offered quarterly but can be taken for credit only twice. Students must begin the program in the fall quarter. (S/U grades only.) *Prerequisites: graduate standing in anthropology and consent of instructor. (S/U grades only.)*

**272. Knowing and Gnosis (4)**

This course explores the way cultures structure and deal with two kinds of knowledge: (1) that which is considered as common sense, rational, or natural; and (2) that which impinges on normal knowledge as inspiration, emotion, intuition, possession, etc. *Prerequisite: graduate standing in anthropology.*

**276. Anthropology and Language (4)**

This course is designed to provide graduate students in anthropology (1) with an overview of linguistic concepts of possible relevance to ethnographic fieldwork, and (2) with an introduction to conceptions of language that have informed the development of anthropological theory.

**279. Holocultural Analysis (4)**

This course introduces the Human Relations Area Files as a means of assessing the ethnographic record. Emphasis is on holocultural analysis, i.e., the evaluation of anthropological theories by use of uniform data from statistically balanced samples of human societies. *Prerequisite: graduate standing in anthropology or consent of instructor. (S/U grades permitted.)*

**280A. Core Seminar in Anthropology (4)**

This seminar represents one of three interconnected core courses that constitute the foundation of the first year of graduate study in the Department of Anthropology. This basic sequence of courses emphasizes both the historical and the contemporary shapes of certain central problems in cultural, psychological, and social anthropology. Each seminar will focus on significant anthropological debates concerning these problems that are phrased in terms of the complex interrelationships of theory and ethnographic data and that attend to fundamental issues of comparative analysis. *Prerequisite: graduate standing in anthropology.*

**280B. Core Seminar in Anthropology (4)**

This seminar represents one of three interconnected core courses that constitute the foundation of the first year of graduate study in the Department of Anthropology. This basic sequence of courses emphasizes both the historical and the contemporary shapes of certain central problems in cultural, psychological, and social anthropology. Each seminar will focus on significant anthropological debates concerning these problems that are phrased in terms of the complex interrelationships of theory and ethnographic data and that attend to fundamental issues of comparative analysis. *Prerequisite: graduate standing in anthropology.*

## APPLIED OCEAN SCIENCE

### 280C. Core Seminar in Anthropology (4)

This seminar represents one of three interconnected core courses that constitute the foundation of the first year of graduate study in the Department of Anthropology. This basic sequence of courses emphasizes both the historical and the contemporary shapes of certain central problems in cultural, psychological, and social anthropology. Each seminar will focus on significant anthropological debates concerning these problems that are phrased in terms of the complex interrelationships of theory and ethnographic data and that attend to fundamental issues of comparative analysis. *Prerequisite: graduate standing in anthropology.*

### 281. Introductory Seminar (4)

This required core seminar is held in the first quarter of the first year of graduate study. Faculty members will present an account of their own interests or of present research. Where appropriate a short preliminary reading list will be given, for the particular lecture. In addition there will be readings (mainly but not exclusively of books or essays produced by the speakers). Two weeks will be set aside for integrating discussion. *Prerequisite: first-year graduate standing in anthropology.*

### 282. Ethnological Issues (4)

An examination of special anthropological issues and problems which have arisen out of ethnographic work in particular regions of the world, e.g., the "pottatch" of the Pacific Northwest, the "cargo cults" of Melanesia, etc. Issues will vary from year to year. *Prerequisite: graduate standing in anthropology.*

### 283. Ethnographic Fieldmethods (4)

An opportunity to use several main field methods of social and cultural anthropology and to discuss their strengths and problems. Includes the genealogical method, various types of interviewing and observation, oral history, and maintenance of fieldnotes and indexes. *Prerequisite: graduate standing in anthropology.*

### 294. Informant Work (1-4)

When available, students will receive training, practice, and experience in working with a member of another culture. Students will elicit and analyze linguistic and cultural information in anticipation of field research in other cultures. *Prerequisite: graduate standing or consent of instructor. (S/U grades only.)*

### 295. Master's Thesis Preparation (1-12)

The student will work on the master's thesis under the direction of the departmental committee chairperson. The course will normally be taken in the spring of the student's second year. *Prerequisites: graduate student in anthropology and permission of master's thesis chairperson. (S/U grades only.)*

### 296A. Fieldwork Proposal Preparation (4)

The student will work in cooperation with his or her departmental committee to develop a research proposal for the doctoral research project. *Prerequisites: graduate standing in anthropology and permission of departmental committee chairperson. (S/U grades only.)*

### 296B. Fieldwork Proposal Preparation (4)

The student will work in cooperation with his or her departmental committee to develop a research proposal for the doctoral research project. *Prerequisites: advanced graduate standing in anthropology and permission of departmental committee chairperson. (S/U grades only.)*

### 297. Research Practicum (1-4)

Supervised advanced research studies with individual topics to be selected according to the student's special interests. *Prerequisite: For anthropology graduate students who have returned from their field research. (S/U grades permitted.)*

### 298. Independent Study (1-4)

Supervised study of individually selected anthropological topics under the direction of a member of the faculty. *Prerequisite: graduate standing. (S/U grades only.)*

### 299. Dissertation Research (1-12)

*Prerequisite: Ph.D. candidacy in anthropology. (S/U grades only.)*

### 500. Apprentice Teaching (1-4)

The course, designed to meet the needs of the graduate students who serve as TA's, includes analyses of texts and materials, discussion of teaching techniques, conducting discussion sections, formulation of topics and questions for papers and examinations, and grading papers and examinations un-

der the supervision of the instructor assigned to the course. Participation in the undergraduate teaching program is required for the Ph.D. degree. The amount of teaching required is equivalent to the duties expected of a 50 percent teaching assistant for one quarter in each of the student's first three years as a graduate student in the department. Enrollment for four units in this course documents the requirement. (S/U grades only.)

## APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)

See Engineering, Division of.

## APPLIED OCEAN SCIENCE

OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

### Associated Faculty:

#### Professors:

Victor C. Anderson, Ph.D. (EECS; MPL)  
LeRoy M. Dorman, Ph.D. (SIO; GRD)  
Carl H. Gibson, Ph.D. (AMES; SIO)  
Douglas L. Inman, Ph.D. (SIO; CCS/MAP)  
George G. Shor, Jr., Ph.D. (SIO; MPL)  
Fred N. Spiess, Ph.D. (SIO; MPL; IMR)  
Charles W. Van Atta, Ph.D. (AMES; SIO)  
Kenneth M. Watson, Ph.D. (SIO; MPL)  
Clinton D. Winant, Ph.D. (SIO, CCS)

#### Professors Emeritus:

Hugh Bradner, Ph.D. (AMES; IGPP)  
Seibert Q. Duntley, Sc.D. (SIO; VL)

#### Associate Professors:

Robert T. Guza, Ph.D. (SIO; CCS)  
William S. Hodgkiss, Ph.D. (SIO; MPL)  
Robert Pinkel, Ph.D. (SIO; MPL)

#### Lecturers:

Fred H. Fisher, Ph.D. (EECS; MPL)  
Dick Seymour, Ph.D. (SIO; FOR)

#### Adjunct Professor:

Reuben Lasker, Ph.D. (SIO; SFC)

#### Associated Research Staff:

#### Research:

Roswell W. Austin, S.B. (SIO; VL)

#### Associated Research Groups:

Marine Physical Laboratory (MPL)  
Institute of Geophysics and Planetary Physics (IGPP)  
Visibility Laboratory (VL)  
Center for Coastal Studies (CCS)  
Institute of Marine Resources (IMR)  
Marine Archaeological Program (MAP)  
Foundation for Ocean Research (FOR)  
Southwest Fisheries Center/NOAA (SFC)  
Geological Research Division (GRD)

## The Graduate Program

Applied Ocean Science (AOS) is an interdepartmental Ph.D. program concerned with man's purposeful and useful intervention in the sea. It is administered by an interdepartmental group composed of members of the faculties of cooperating departments: the Graduate Department of the Scripps Institution of Oceanography (SIO), the Department of Applied Mechanics and Engineering Sciences (AMES), and the Department of Electrical Engineering and Computer Sciences (EECS).

This interdepartmental curriculum combines the resources of these departments to produce oceanographers who are knowledgeable of modern engineering and instrumentation, as well as marine oriented engineering scientists who are familiar with the oceans. Since physical, chemical, geological, and biological aspects of the oceans and all forms of engineering may be involved, the curriculum provides maximum flexibility in meeting the needs of each individual student.

Candidates for admission should apply directly to one of the departments participating in the Applied Ocean Science program, listing Applied Ocean Science as an area of specialization. The choice of department should be based on the individual student's planned area of major emphasis. The necessary undergraduate preparation for admission will be that required by the department to which the student applies.

The program is primarily directed towards the Ph.D. degree. However, both the candidate of philosophy and master of science degree (either Plan I, thesis, or Plan II, comprehensive examination) also will be offered under special circumstances. Students applying for a terminal master's program should be aware of any special requirements for the department to which they apply.

The degrees completed under this program in the Department of SIO will carry the title "Oceanography." Those degrees completed in the other cooperating departments will have the parenthetical title "(Applied Ocean Science)" appended to the appropriate authorized title.

## Courses

All students enrolled in the program are required to take or demonstrate proficiency in the following core courses or their equivalent:

**SIO 210A (Physical Oceanography)**

**SIO 240 (Marine Geology)**

**SIO 260 (Marine Chemistry)**

**SIO 280 (Biological Processes in the Sea)**

**AMES 294A-B-C (Methods in Applied Mechanics) or**

**Math. 210A-B-C (Mathematical Methods in Physics and Engineering)**

The students are expected to enroll in the Applied Ocean Science Seminar (SIO 208) throughout their period of residency. This seminar will make use of outside speakers, faculty members, and students in presenting various topics on applied ocean science and related fields. It provides a central forum in which all AOS students can participate. In addition to these basic requirements, the student will be subject to whatever additional requirements are prescribed by his or her department.

Since the first year's course work is almost entirely devoted to the AOS core courses, that time provides an excellent opportunity for students to investigate the research programs of the various research groups on the campus, and cultivate association with professors and research groups which can provide support and guidance for thesis research in their selected field of specialization. In consultation with an adviser, students will plan a curricular path of courses which will adequately prepare them in their field of specialization. The courses may be selected from the entire catalog of courses available on the UCSD campus or where appropriate from other UC campuses and other universities.

## BIOCHEMISTRY

There is no department of biochemistry at UCSD. There is an undergraduate major in biochemistry and cell biology offered by the Department of Biology and an undergraduate major in chemistry/biochemistry offered by the Department of Chemistry; these majors are described in the biology and chemistry sections of this catalog.

Both the Department of Biology and the Department of Chemistry offer graduate programs with specialization in biochemistry. Those programs are described in the biology and chemistry sections of this catalog.

## BIOLOGY

OFFICE: 2130 Bonner Hall, Revelle College

STUDENT SERVICES OFFICE: 1208 Muir Biology Building  
(619) 534-2580

### Associated Faculty:

#### Professors:

Darwin K. Berg, Ph.D.  
Jack W. Bradbury, Ph.D.  
Stuart Brody, Ph.D.  
Adelaide T. C. Carpenter, Ph.D.  
Ted J. Case, Ph.D.  
Maarten J. Chrispeels, Ph.D.  
Richard W. Dutton, Ph.D. (*Chairman*)  
Richard A. Firtel, Ph.D.  
Morris E. Friedkin, Ph.D.  
E. Peter Geiduschek, Ph.D.  
Michael E. Gilpin, Ph.D.  
Melvin H. Green, Ph.D.  
Clifford Grobstein, Ph.D.  
Masaki Hayashi, Ph.D.  
Donald R. Helinski, Ph.D.  
John J. Holland, Ph.D.  
Stephen H. Howell, Ph.D.  
William B. Kristan, Jr., Ph.D.  
Dan L. Lindsley, Ph.D.  
William F. Loomis, Jr., Ph.D.  
William D. McElroy, Ph.D.  
Stanley E. Mills, Ph.D.  
Maurice Montal, Ph.D.  
Xuong Nguyen-Huu, Ph.D.  
Paul A. Price, Ph.D.  
Paul D. Saltman, Ph.D.  
Milton H. Saier, Ph.D.  
Allen I. Selverston, Ph.D.  
Immo E. Scheffler, Ph.D.  
S. Jonathan Singer, Ph.D.  
Douglas W. Smith, Ph.D.  
Nicholas C. Spitzer, Ph.D.  
Herbert Stern, Ph.D.  
Kiyoteru Tokuyasu, Ph.D.  
Silvio S. Varon, M.D.  
Christopher J. Wills, Ph.D.  
David S. Woodruff, Ph.D.  
Juan Yguerabide, Ph.D.

#### Associate Professors:

Willie C. Brown, Ph.D.  
P.A.G. Fortes, M.D., Ph.D.  
William A. Harris, Ph.D.  
Muriel N. Nesbitt, Ph.D.  
Ramon Piñon, Ph.D.  
Percy J. Russell, Ph.D.  
Deborah H. Spector, Ph.D.  
Susan L. Swain, Ph.D.  
Sandra L. Vehrencamp, Ph.D.

#### Assistant Professors:

Douglass J. Forbes, Ph.D.  
Stephen M. Hedrick, Ph.D.  
John W. Newport, Ph.D.  
James W. Posakony, Ph.D.  
Trevor D. Price, Ph.D.  
Suresh Subramani, Ph.D.  
Jean Y. J. Wang, Ph.D.

Michael P. Yaffe, Ph.D.  
Charles G. Zuker, Ph.D.

\* \* \*

Michael J. Bevan, Ph.D., (*Associate Adjunct Professor*)  
Suzanne Bourgeois, Ph.D., (*Adjunct Professor*)  
Jacques Chiller, Ph.D., (*Adjunct Professor*)  
Melvin Cohn, Ph.D., (*Adjunct Professor*)  
Walter Eckhart, Ph.D., (*Adjunct Professor*)  
Martin Haas, Ph.D., (*Associate Adjunct Professor*)  
Ronald M. Evans, Ph.D., (*Adjunct Professor*)  
Yasuo Hotta, Ph.D., (*Research Biologist*)  
Frank M. Huennekens, Ph.D., (*Adjunct Professor*)  
Anthony R. Hunter, Ph.D., (*Adjunct Professor*)  
Norman R. Klinman, Ph.D., (*Adjunct Professor*)  
Simon LeVay, Ph.D., (*Adjunct Associate Professor*)  
Bartholomew M. Sefton, Ph.D., (*Associate Adjunct Professor*)  
Jonathan Sprent, Ph.D., (*Adjunct Professor*)  
Inder Verma, Ph.D., (*Adjunct Professor*)  
Geoffrey M. Wahl, Ph.D., (*Adjunct Associate Professor*)  
William O. Weigle, Ph.D., (*Adjunct Professor*)

### Major Programs

The UCSD Department of Biology is structured about the different levels of biological organization — biochemical, cellular, physiological, and ecological. The research and the teaching of the department emphasize the fundamentally important processes that occur at each of these levels. On such a solid foundation, future training and study in any area of biology is possible — from plant breeding to genetic counseling, from medical microbiology to ecological epidemiology, from veterinary science to cancer research. The UCSD campus is situated among some of the finest research institutions in the world. The Department of Biology is fortunate in having close ties with the Scripps Institution of Oceanography, the Salk Institute of Biological Studies, and the Scripps Clinic and Research Foundation, all of which open interesting avenues for motivated students.

The department offers six different major programs, each of which provides an excellent background for future graduate or professional study. They are (1) general biology, (2) animal physiology, (3) bio-

## BIOLOGY

chemistry and cell biology, (4) molecular biology, (5) microbiology, and (6) ecology, behavior, and evolution. The requirements of each of the majors are designed to meet the needs of a different group of students. These requirements are quite concordant, reflecting the department's philosophy that familiarity with certain basic aspects of the subject is fundamental to all specialized understanding. Bachelor of arts degrees granted in each of these majors will be so designated.

The Student Services Office, 1208-1218 Muir Biology Building, administers the undergraduate biology program for all four colleges. Students should contact this office with any questions regarding the biology majors or minor.

The lower-division requirements in mathematics, physics, and chemistry are similar for all of the major programs: three quarters of mathematics (the biochemistry/cell biology major and the molecular biology major require Math. 2A, 2B, and 2C); three quarters of physics (the molecular biology major requires Physics 2A, 2B, and 2C), two or three quarters of chemistry, at least one laboratory course in chemistry (8AL is recommended), and one laboratory course in physics. (For ecology, behavior, and evolution majors, Biology 50 is required in lieu of the chemistry and physics laboratories.) The following three integrated sequences are listed in ascending order of rigor:

|             | Sequence<br>1     | Sequence<br>2            | Sequence<br>3            |
|-------------|-------------------|--------------------------|--------------------------|
| Mathematics | 1A-B-C            | 2A-B-C                   | 2B-C                     |
| Physics     | 1A-B-C<br>+ 1 lab | 2A-B-(C or D)<br>+ 1 lab | 2A-B-(C or D)<br>+ 1 lab |
| Chemistry   | 6A-B-C<br>+ 1 lab | 6A-B-C<br>+ 1 lab        | 7A-B<br>+ 1 lab          |

Students with special interests in physical or chemical aspects of biology are urged to opt for Sequence 2 or 3. For Sequences 1 and 2 it is recommended that the mathematics and chemistry be taken in the freshman year and physics in the sophomore year. Sequence 3 is suitable for students who by virtue of their background are able to enroll as first-quarter freshmen in Mathematics 2B or higher; they can begin Physics 2A in the fall quarter of the freshman year and begin Chemistry 7A in the winter quarter of the sophomore year.

All biology major programs require at least two quarters of the three-quarter introductory biology sequence; i.e., Biology 1 plus either Biology 2 or Biology 3. All three quarters are strongly recommended, as they provide exceedingly useful background for upper-division

course work. It is also required that enrollment in Biology 1 be delayed until a student has completed two quarters of introductory chemistry. (Although it is not recommended, the second quarter may be taken concurrently.) Students who have earned a score of 4 or 5 in the Placement Examination in Biology of the College Entrance Examination Board may be excused from the requirement for introductory biology. **Students must provide the Department of Biology with copies of their Advanced Placement scores.**

**All biology majors, except ecology, behavior, and evolution, are required to complete a lower-division physics lab and a lower-division chemistry lab. Students must not delay taking these labs until the final (graduating) quarter. All required courses must be satisfied. Even if a student has completed all of the required upper-division courses for the major, all lower-division requirements must also be satisfied. Students must either complete the required course(s) at UCSD, take an equivalent course at another institution, or take an "Exam for Credit" for the course(s). No course requirement will be waived.**

**Students are expected to complete all of the lower-division course work, including the lower-division physics and chemistry labs, prior to starting the upper-division requirements for the major.**

### Admission to the Majors

At the time this catalog went to print, the Department of Biology's Undergraduate Curriculum Committee was in the process of formulating a possible "pre-major" requirement for each of the six biology majors. This requirement would mandate that students would not be permitted to declare one of the six biology majors without first obtaining departmental approval (via departmental stamp). Students would be required to provide the department with proof of satisfactory completion of the lower-division requirements for the major (this would include the lower-division math, physics, chemistry, and biology courses). No D grades would be acceptable in any of these courses, and the minimum G.P.A. requirement in both the overall UCSD and the lower-division major requirements would be 2.0 (with the exception of the biochemistry/cell biology and the molecular biology majors which would both have significantly higher minimum G.P.A. requirements). Students en-

tering UCSD as of fall quarter, 1987, any continuing UCSD students who have not declared one of the six biology majors, and currently declared biology majors who may want to change to one of the other biology majors would be held responsible for the above requirements. Students must contact the undergraduate adviser, room 1218, Muir Biology Building, 534-2786, to obtain information regarding admission to one of the biology majors.

The different majors variously require thirteen to sixteen four-unit upper-division or four-unit graduate courses in biology. Only one quarter of Biology 195 plus one quarter of Biology 198 or 199 may be applied toward this requirement. With the exception of Biology 195, 198 and 199, all required courses (including prerequisites) must be taken for a letter grade unless specifically exempted from this requirement in the course description. No 199 course, or 195 course, taken outside the Department of Biology may be applied toward any of the biology majors. **Students must take at least nine of these required upper-division courses at UCSD in order to graduate with a major in any of the six programs offered by the Department of Biology.**

No Academic Internship Program 197 may be applied toward any of the biology majors, unless approval to do so, *prior* to the commencement of the internship, has been received by the student, via petition. The deadline for submitting such petitions to the Department of Biology is the eighth week of the quarter preceding the quarter in which the internship will be completed. No petitions, to count an internship toward the major, will be accepted by the Department of Biology after the internship has started or has been completed.

**NOTE: If a student receives departmental approval to have an Academic Internship Program (AIP) 197 counted toward the major, he or she may not then have a Biology 198 or 199 counted for the major, also. Only one special studies course may be applied toward any of the six biology majors.**

### Grade Requirements for the Majors

All courses taken in fulfillment of major requirements must be passed with a grade of C- (C minus) or better. This rule applies to lower-division as well as upper-division courses; and it applies to courses taken from other departments to be used for the biology major as well as transfer



course work to be applied to the major. D grades are **not** acceptable for any courses to be used for the major. In addition, a major G.P.A. and overall UCSD G.P.A. of at least 2.0 is required for graduation. (Note: The biochemistry/cell biology major and the molecular biology major may have a significantly higher G.P.A. requirement. Please refer to the "Admission to the Majors" portion of the biology section in this catalog or contact the undergraduate adviser, room 1218, Muir Biology Building, for information.) **All courses, required for any of the six majors, must be taken for a letter grade with the exception of Biology 195, 198, or 199.**

### Students with Transfer Credit

Courses (including prerequisites to the major) from an institution other than UCSD may not be applied toward the major unless the equivalency to UCSD courses has been determined by the Department of Biology. To have the equivalency verified, students must provide the Department of Biology (Room 1218, Muir Biology Building) with the following:

1. A copy of the transcript(s) from the other institution(s).
2. A copy of the transfer evaluation (this form is sent to students by the UCSD Office of Admissions after that office has reviewed the official transfer transcript).
3. If the transfer work was not completed at a local San Diego area community college, the student must provide the Department of Biology with a copy of the course description of any transfer course, requested to be applied toward the major, in addition to the above items #1 and #2.

In some cases, courses must be petitioned to be applied toward the major, *in addition* to providing the above three items to the department. The need for petitioning would be determined, by the department, after reviewing the above items.

**IT IS THE STUDENT'S RESPONSIBILITY TO PROVIDE THE ABOVE DOCUMENTATION TO THE DEPARTMENT OF BIOLOGY DURING THE FIRST QUARTER OF MATRICULATION AT UCSD.**

**Please note: Only those lower-division transfer courses which have been determined to be equivalent to UCSD courses may be applied toward any of the biology majors' lower-division requirements.** (i.e., No transfer

physics courses will be accepted unless calculus was the prerequisite.) No transfer biology course will be accepted in lieu of UCSD's Biology 1 unless that course dealt only with cell biology and had a college level general chemistry course as a prerequisite. The Biology 2 requirement will be cleared only with a transfer course which covered both the development and the physiological processes of both plants and animals. Usually the Biology 2 requirement may be cleared with both a botany and a zoology course, if the transfer courses are deemed to be "science major" courses.

**No lower-division transfer course may be petitioned to count in lieu of an upper-division course at UCSD.**

### GENERAL BIOLOGY MAJOR

**Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.**

This program allows the most diversified exposure to biology of any of the majors offered by the Department of Biology. It is designed for students with broad interests who do not wish to be constrained by the specialized requirements of the other majors.

#### Lower-Division Requirements

Lower-division requirements are designed to provide the foundations in mathematics, physics, and chemistry that are fundamental to the study of biology. In addition, an introduction to biology is required to provide the appropriate background for upper-division biology courses. The lower-division requirements are subsumed in large part under those of the various colleges.

*Biology:* Biology 1, 2, and 3

*Mathematics, Physics, Chemistry:* Sequence 1, 2, or 3 (refer to lower-division sequence chart)

#### Upper-Division Requirements

Specific requirements have been held to a minimum for this major in order to allow students maximum freedom in fitting course schedules to their particular needs. Because of the central positions of biochemistry and genetics in all of modern biological thought, only Biochemistry I (Biology 101), its organic chemistry prerequisites (Chemistry 140A and B), and Genetics (Biology 131) are prescribed requirements for general biology majors. In addition, general biology majors must take at least ten other four-unit upper-

division or four-unit graduate courses in biology, including at least one four-unit upper-division laboratory course (the laboratory course to be chosen from the following: Biology 103, Biology 112, Biology 123, Biology 132, Biology 137, Biology 138, Biology 142, Biology 152, Biology 154, and Biology 157). Only one quarter of Biology 195 and one of *either* Biology 198 or 199 may be applied toward this fourteen-course requirement. Although students are free to design upper-division curricula which meet their individual educational goals, Molecular Biology (Biology 106) and Cell Biology (Biology 111) are strongly recommended for those contemplating applying to graduate or professional schools.

### ANIMAL PHYSIOLOGY MAJOR

**Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.**

The animal physiology major provides a program for studying the bodily functions of complex organisms. Within this major, a student may concentrate upon more specialized areas of study, such as human biology, neurobiology, endocrinology, reproduction, marine biology, or ethology. This major is most directly applicable to health-related professions such as medicine, nursing, dentistry, veterinary medicine, pharmacy, physical therapy, and medical technology. Animal physiology majors are also well prepared to enter other professions such as physiological research, physical education, agriculture, and wildlife management.

#### Lower-Division Requirements

*Biology:* Biology 1 and 2. In addition, Biology 3 is strongly recommended.

*Mathematics, Physics, Chemistry:* Sequence 1, 2, or 3 (refer to lower-division sequence chart).

#### Upper-Division Requirements

Listed below are the courses required for the animal physiology major. The first four requirements provide exposure to the current understanding of subcellular function that should be at the command of all modern biologists. Requirements 5 through 8 constitute the core of the animal physiology major. By choosing four other four-unit upper-division biology courses (requirement 9), a program geared to the needs of the individual student can be formulated.

## BIOLOGY

1. Organic Chemistry (Chemistry 140A, 140B, and 143A)
2. Biochemistry (Biology 101)
3. Molecular Biology (Biology 106)
4. Genetics (Biology 131)
5. Mammalian Physiology (Biology 151 and 153)
6. Comparative Physiology (Biology 155)
7. Neurobiology (Biology 156)
8. One of three Physiology Laboratories (Biology 152, Biology 154, or Biology 157)
9. Four other four-unit upper-division or four-unit graduate courses in biology. These may include no more than one quarter of Biology 195 and one quarter of either Biology 198 or Biology 199.

### BIOCHEMISTRY AND CELL BIOLOGY MAJOR

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

This major is designed to provide students with the fundamental courses required for entry into a school of medicine or into postgraduate training in a wide variety of areas of biological and biomedical sciences: biochemistry, biophysics, genetics, molecular biology, cell biology, developmental biology, microbiology, virology, human biology (physiology, metabolism, genetic disorders), cancer biology, pharmacology, and others. The emphasis is on basic principles which help us understand those processes unique to living organisms at the molecular level.

The program includes two required upper-division biology laboratory courses to provide practical experience with modern techniques and useful technology for those seeking positions as lab technicians in clinical and basic research laboratories. The opportunity to select five elective courses allows students either to seek a still broader background in a variety of biology courses or to begin specialization in a chosen field of study.

#### Lower-Division Requirements

*Biology:* Biology 1 and either Biology 2 or 3; both are recommended.

*Mathematics:* Math. 2A, 2B, and 2C.

*Physics, Chemistry:* Sequence 1, 2, or 3 (refer to lower-division sequence chart). Sequences 2 and 3 provide the most appropriate background for the biochemistry and cell biology major. Students in-

tending to pursue this major are strongly advised to enroll in the courses in sequence 2 or 3 in preference to those in sequence 1.

#### Upper-Division Requirements

1. Two quarters of Organic Chemistry (Chemistry 140A-B)
2. One Chemistry Laboratory: Organic Chemistry (Chemistry 143A) or Physical Chemistry (Chemistry 105A)
3. Biochemistry I (Biology 101)
4. Biochemical Techniques (Biology 103)
5. Physical Biochemistry (Biology 104)
6. Molecular Biology (Biology 106)
7. Cell Biology (Biology 111)
8. Genetics (Biology 131)
9. One upper-division lab other than Biology 199, to be chosen from the following: Cell Biology (Biology 112), Embryology (Biology 123), Eukaryotic Genetics (Biology 132), Microbial Genetics (Biology 137), Recombinant DNA Techniques (138), Microbiology (142), Mammalian Physiology (Biology 152 or 154), Neurobiology (Biology 157), or Organic Chemistry (Chemistry 143C)
10. At least five more four-unit upper-division or four-unit graduate courses in biology. Only one quarter of Biology 195 and one of Biology 198 or 199 may be applied toward the fulfillment of this requirement.

### MOLECULAR BIOLOGY MAJOR

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

The program for majors in molecular biology is designed to provide an intensive exposure to the theoretical concepts and experimental techniques of molecular biology. As such, it is recommended for those students who have a particularly strong interest in this field of study. Considerable emphasis is placed on chemistry, biochemistry, and genetics for students enrolled in the program.

#### Lower-Division Requirements

*Biology:* Biology 1 and 2. Biology 3 is recommended in addition to 1 and 2.

*Mathematics, Physics, Chemistry:* Sequence 2 or 3 (refer to lower-division sequence chart).

#### Upper-Division Requirements

1. Organic Chemistry (Chemistry 140A and B)
2. Physical Chemistry (Chemistry 131) or Physical Biochemistry (Biology 104)
3. Organic Chemistry Laboratory (Chemistry 143A) or Physical Chemistry Laboratory (Chemistry 105A)
4. Genetics (Biology 131)
5. Biochemistry (Biology 101)
6. Molecular Biology (Biology 106)
7. Cell Biology (Biology 111)
8. Microbial Genetics (Biology 136)
9. Regulation of Gene Activity in Eukaryotic Cells (Biology 125)
10. Biochemistry Laboratory (Biology 103) or Microbial Genetics Laboratory (Biology 137)
11. Laboratory in Recombinant DNA Techniques (Biology 138)
12. At least four more four-unit upper-division or four-unit graduate courses in biology are required. Attention is drawn to Biology 143, Biology 113, and Biology 116. Only one quarter of Biology 199 and one of Biology 195 may be used to fulfill this requirement.

### MICROBIOLOGY MAJOR

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

The microbiology major is designed to prepare students for professional careers in a variety of health-related programs. The specialization in microbiology can provide the basic background for work in medical technology, or for further training in public health or other health-related specialties. The program is also designed to provide a foundation for graduate studies in microbiology, virology, and a variety of allied fields as well as for medical and dental school.

#### Lower-Division Requirements

*Biology:* Biology 1 and either Biology 2 or 3; both are recommended.

*Mathematics, Physics, Chemistry:* Sequence 1, 2, or 3 (refer to lower-division sequence chart).

#### Upper-Division Requirements

1. Two quarters Organic Chemistry (Chemistry 140A-B)
2. Organic Chemistry Laboratory (Chemistry 143A)



3. Biochemistry I (Biology 101)
4. Biochemical Techniques (Biology 103)
5. Molecular Biology (Biology 106)
6. Immunology (Biology 113)
7. Genetics (Biology 131)
8. Bacteriology (Biology 141)
9. Laboratory in Microbiology (Biology 142)
10. Animal Virology (Biology 143)
11. At least four other four-unit upper-division or four-unit graduate courses in biology or related subjects. These may include no more than one quarter of Biology 195 and one quarter of Biology 198 or 199. Other courses of special interest to microbiology majors are listed below:

Cell Biology (Biology 111)  
 Regulation of Gene Activity in Eucaryotic Cells (Biology 125)  
 Membrane Biology (Biology 114)  
 Microbial Genetics (Biology 136)  
 Microbial Genetics Laboratory (Biology 137)  
 Medical Microbiology (Biology 144)

## ECOLOGY, BEHAVIOR, AND EVOLUTION MAJOR

**Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.**

This major includes the fields of population biology, ecology, animal behavior and sociobiology, population genetics, and evolution. Each of these fields consists of a variety of subdisciplines: e.g., ecology includes population ecology, community ecology, biogeography, theoretical ecology, etc. The fields have in common a focus on evolutionary processes and whole animals in relation to each other and to their environments. Research careers in ecology, behavior, and evolution can range all the way from tropical ecology studies through work on the communication signals of marine invertebrates to the design and maintenance of ecological preserves. Applied careers for ecologists are equally varied: recent graduates now work in forestry, wildlife management, as ecological consultants for the government and private industry, or in new fields such as ecological medicine and epidemiology, environmental design and environmental planning, conservation ecology, and restoration ecology (the repair of damaged ecosystems).

Because ecology, behavior, and evolu-

tion span such a variety of topics and methods, this major has been designed to provide the basic fundamentals while allowing maximum flexibility within the general topic areas. Once students have completed a year of introductory biology, they may wish to consult with the ecology, behavior, and evolution faculty coordinator to design a specific track within the major. One of the four general tracks is suggested: a) Mathematics-statistics; b) Ecology and conservation; c) Behavior and communications; d) Evolution. See below for suggested courses in these tracks. All ecology, behavior, and evolution majors regardless of interests must complete the following minimal requirements to graduate.

### Lower-Division Requirements

**Biology:** Biology 1, 2, and 3 (Please note: students should take Biology 3 during the first year at UCSD, if possible.)

**Mathematics:** Three quarters are required. Mathematics 2A, 2B, and 2C are strongly recommended, but 1A, 1B, and 1C are acceptable. Students interested in following the mathematics-statistics track are encouraged to take in addition Mathematics 2D and 2E, Mathematics 80A and 80B, and/or Psychology 60.

**Chemistry:** Chemistry 6A, 6B, 6C or Chemistry 7A, 7B. Laboratories in chemistry are not required. Note that students who intend to take biochemistry will need at least two quarters of Chemistry 6 and two quarters of Organic Chemistry (Chemistry 140A-B). Biochemistry (Biology 101) is strongly recommended for many areas of population biology, particularly those dealing with evolutionary studies. Students who take Biology 101 are then eligible to take many courses in the biology curriculum that are otherwise closed to them.

**Physics:** Three quarters of physics are required, Physics 1A, 1B, 1C or Physics 2A, 2B, 2C. Physics 10 and 11 are not acceptable. Laboratories in physics are not required.

**Computer Programming:** Biology 50 is required for all ecology, behavior, and evolution majors.

### Upper-Division Requirements

1. Genetics (Biology 131). This course should be taken as early as possible, ideally at the end of the second year.
2. Ecology, Behavior, and Evolution. Five quarter-courses to be chosen from the

following: Biology 134, 162, 163, 164, 165, 166, 167, 168, and 181.

3. Seven additional four-unit upper-division or four-unit graduate courses in biology, chemistry, or mathematics. (Four courses would be required in addition to Chemistry 140A, Chemistry 140B and Biology 101, if the student elects to take these three courses.) Particularly recommended are courses in organic chemistry, biochemistry, and physiology.

**Please note: A maximum of four of these courses may be taken outside of the Department of Biology.**

Courses offered outside the Department of Biology that are especially appropriate and that have been approved in the past include:

**Mathematics/statistics track** — Math. 180A-B-C, 181A-B-C, 111A-B-C; SIO 276A.

**Ecology/conservation track** — Chemistry 149A; SIO 256A, 275C-D, 280; Anthropology 113; Earth Science 101.

**Behavior/communication track** — SIO 286, 293A-B; Anthropology 101, 110.

**Evolution track** — Chemistry 122, 140A-B; SIO 273, 274, 288; Anthropology 110, 161; Frontiers of Science 138.

4. The seven required courses listed in item number 3 above must include at least two different laboratory or field courses. Acceptable options include: Biology 103, Biology 112, Biology 123, Biology 132, Biology 137, Biology 138, Biology 142, Biology 152, Biology 154, Biology 165, Biology 166 (winter 1987 only), Biology 168L, Biology 170, Biology 172; SIO 275D, 256A, or a laboratory or field-oriented Biology 199 course.

**Substitutions will rarely be allowed and must be approved (by petition) prior to taking the course to be petitioned.**

Certain intensive summer session courses offered at various universities and field stations throughout the country may be used to satisfy this requirement, partially, if prior approval is obtained from the faculty adviser of the major (by petition). A good example is the field course in tropical biology offered in Costa Rica each spring quarter. (Consult the Education Abroad Program Office at the UCSD International Center for details of this program.)

## HONORS THESIS IN BIOLOGY

Students in any of the major programs who have a 3.7 grade-point average or above in upper-division science courses at the end of their junior year are eligible to undertake the honors thesis. **(NOTE: At the time this catalog went to print, the Undergraduate Curriculum Committee was in the process of formulating a change in the G.P.A. requirement for the Honors Thesis Program. The G.P.A. of at least 3.7 would be required in the biology major and the overall UCSD G.P.A. in addition to the upper-division science courses. Students must contact the undergraduate adviser, room 1218, Muir Biology Building, to verify the G.P.A. requirement for admission to the Honors Program.)** This program covers the senior year of undergraduate study and involves a maximum of twelve units of senior thesis research (Biology 196) taken in addition to the major requirements for graduation. Research is conducted under the supervision of a faculty member of the Department of Biology *only* and cannot be performed in the research labs of other departments such as the School of Medicine, SIO, etc. If there are any questions as to which faculty members are eligible, students should consult with the Honors Thesis adviser. The research will culminate in a senior thesis and an oral report (see below). Students who complete the program satisfactorily will have "Distinction in Biology" recorded on their transcript. Students who fail to make satisfactory progress will be advised to withdraw from the program and, if eligible, will receive four units per quarter of Biology 199. Students may also withdraw voluntarily from the program and, if eligible, receive appropriate credit for Biology 199. Grades for Biology 196 are P, NP, or I only.

Students interested in the program who are eligible at the end of the spring quarter of their junior year need to find a faculty member willing to act in the capacity of thesis adviser. After an adviser is selected, a petition should be sent to the faculty coordinator of the student's major. The petition should contain the research proposal, as defined in consultation with the honors thesis adviser and GPA certification, which may be obtained from the Undergraduate Program Office. Approval may be obtained from the major program faculty coordinator at the beginning of the summer session by students wishing to start the program during the summer preceding the senior year.

Entry into the second quarter of the pro-

gram will require submission to the honors thesis adviser of a written report by the student, summarizing the data obtained in the first quarter. A brief oral interview of the student on this report can also be expected. If the progress made appears reasonable for an Honors Student, then the 196 petition will be signed. If not, conversion of the 196 credit to Biology 199 will be recommended. Entry into the third quarter will also require a report and interview of the student. Completion of the program will require a final written report by the student at the end of the third quarter plus an oral presentation in the middle of the quarter to a group of students plus some faculty, including the honors thesis adviser.

## Minor in Biology

To receive a minor from the Department of Biology, a student must complete at least three, four-unit lower-division biology courses and at least three, four-unit upper-division biology courses. Students may apply transferable biology courses, from another institution, toward the lower-division requirement, after obtaining approval from the biology department (see section on "Students with Transfer Credit" for the major to verify documentation needed). *All* of the upper-division courses must be completed at UCSD. No courses taken outside of the Department of Biology may be applied toward the biology minor.

The lower-division biology courses (Biology 10-50) are intended for nonmajors, but in preparation for upper-division courses, students wishing to minor in biology are advised to take the sequence Biology 1, 2, and 3. This sequence will be adequate preparation for the following upper-division courses: Genetics (Biology 131), Introduction to Human Genetics (Biology 133; restricted to nonmajors), Comparative Physiology (Biology 155), Sociobiology (Biology 164), and Animal Communication (Biology 166). Biology courses with a more molecular orientation require at least biochemistry as a prerequisite, which in turn has organic chemistry as a prerequisite. Students wishing to take such courses as minors may have to take more than the minimum load of courses.

## Students Participating in the Education Abroad Program

Students who will be participating in the Education Abroad Program must counsel with both the undergraduate adviser (Room 1218, Muir Biology Building) and

their faculty adviser **prior** to going abroad. It is the student's responsibility to seek advice from both of the above advisers. Failure to do so may result in the student's need to postpone his or her graduation plans.

While the University of California accepts credit for approved EAP courses, the Department of Biology retains the right to determine the extent to which it will accept units so earned in the fulfillment of the major requirements. The department may accept certain EAP courses as satisfaction of specific required core courses for the major; however, this must be approved by petition. Petitions will be evaluated only *after* EAP courses have been officially recorded on the student's UCSD transcript. A copy of the latest transcript, with EAP courses posted, must be attached to the student's petition(s).

Students, who participate in the Education Abroad Program must complete at least six upper-division courses (four units each) taken through the Department of Biology, UCSD to satisfy the departmental EAP residency requirement for graduation with one of the six biology majors.

## Integrated Bachelor's/Master's Degree Program

An integrated program leading to a bachelor of arts degree and a master of science degree in biology is offered to those undergraduate students who are enrolled in any one of the major programs offered by the Department of Biology. Before the last quarter of their junior year, students interested in obtaining the M.S. degree within one year following receipt of the B.A. degree may apply to the department for admission to the program (Undergraduate Office, 1218 Muir Biology Building). To be eligible, students must have completed the first two quarters of their junior year in residence at UCSD and must have a G.P.A. of 3.2-3.5 **(NOTE: At the time this catalog went to print, the Department of Biology's Graduate Committee was in the process of formulating revisions to the minimum G.P.A. requirement for admission to the Integrated B.A./M.S. Program. The revised minimum G.P.A. requirement would be a figure between 3.2 and 3.5 in both the major and overall. Students must contact the undergraduate adviser, room 1218, Muir Biology Building to obtain information on admission requirements for the B.A./M.S. Program.)** or higher in both the major and overall. It is the responsibility of the prospective B.A./M.S. student to select a

faculty member (from the Department of Biology) who would be willing to serve as the student's adviser and in whose laboratory the student would carry out at least twenty-four units of research over a two-year period as described below. The twelve units of research (Biology 271) which will be completed during the student's senior undergraduate year must be taken IN ADDITION to the requirements for the bachelor's degree; these twelve units will count toward the requirements for the master's degree only. The student must confirm that the selected faculty adviser will not be on sabbatical leave during any quarter of the scheduled B.A./M.S. project. The student will also arrange (with the adviser's guidance) a schedule of courses for the senior year that will fulfill the requirements for the B.A. degree while also serving the program planned for the M.S. degree. Students are expected to meet the requirements for the M.S. degree in one year (three consecutive academic quarters) from the date of receipt of the B.A. degree.

#### Requirements for the master of science degree are as follows:

1. Completion of thirty-six units (**NOTE: At the time this catalog went to print, the Department of Biology's Graduate Committee was in the process of formulating revisions to the number of graduate units required for the Integrated B.A./M.S. Program. The minimum number of units of graduate course work required for the program may be increased to forty-eight. Students must contact the undergraduate adviser, room 1218, Muir Biology Building to obtain the final unit requirement decision.**) of graduate course work (Biology 200-level or higher, or approved courses offered by other departments at a similar level) during the senior undergraduate year and the graduate year. The course of study must be approved by the faculty adviser and must include the following:
  - a. Completion of four units of research during each of the three quarters of the senior year (Biology 271). **NOTE: It is mandatory that students complete three complete, separate, and consecutive academic quarters (with four units of research [Biology 271] during each of the quarters) AFTER THE QUARTER IN WHICH THE STUDENT HAS RECEIVED OFFICIAL ACCEPTANCE INTO THE PROGRAM,** by

the Department of Biology, and prior to the receipt of the B.A. degree.

- b. Completion of at least four units of research during each of the three quarters of the subsequent graduate year (Biology 271).
  - c. Completion of four units of teaching during the graduate year (Biology 500).
  - d. Completion of at least eight (**Note: this figure may be increased to at least twenty, see item #1**) additional units of graduate level course work in biology or related disciplines during the graduate year.
2. Maintenance of a grade-point average (both overall and in the major) of at least 3.0 for all course work, both cumulatively and for each quarter of enrollment in the B.A./M.S. program. If the student's G.P.A. falls below 3.0 (for either overall or in the major), he or she will automatically be dropped from the program. **THERE WILL BE NO EXCEPTIONS TO THIS POLICY.**
  3. Completion of a thesis, with presentation to, and approval of, a three-member committee (the adviser and two other faculty members).
  4. Three quarters of residency beyond the requirement for the bachelor's degree.

The program is open only to UCSD undergraduates. The Department of Biology does not currently have financial aid available for students enrolled in this program.

### The Doctoral Program

Graduate studies for a Ph.D. degree in the Department of Biology are oriented mainly toward the development of the capacity for independent research and for teaching in the biological sciences.

The requirements for entrance to graduate study in the Department of Biology are flexible, but a strong background in mathematics, chemistry, and physics is recommended.

Formal course work and opportunities for dissertation research include most basic areas of experimental biology with emphasis in the general areas of molecular and cell biology, biochemistry and biophysics, genetics and regulation, developmental biology, neurology, population biology, ecology, virology, and immunology.

During the first year of graduate study, each student undertakes a research project in the laboratory of each of four to six different faculty members, and is expected to spend a major portion of his or her academic time on this project. The laboratories are selected by the student in consultation with the graduate committee to provide a broad view of the research interests of the department. The student is also expected to enroll in the first-year graduate biology sequence which includes advanced material in genetics, molecular biology, cell biology, virology, and immunology. The only other general course requirement for the Ph.D. is a minimum of sixteen units of Biology 500 (Apprentice Teaching in Biology.) Graduate students are required to participate in undergraduate teaching under the supervision of the responsible faculty member 50 percent of the time for one quarter in each year of graduate study following the first year. A program of further study, including seminars and courses appropriate to a student's background and interests, is arranged through consultation between the student and the faculty. Much reliance is placed on informal instruction through early and close association of the student with the faculty and research staff, and through regular seminars. After becoming familiar with the research activities of the faculty through the laboratory rotation program, the student begins work on a thesis research problem of his or her choice, no later than the end of the first year. The student is free to choose for the thesis adviser a regular member of the UCSD faculty or an adjunct member of the Department of Biology faculty. By the end of the third year, the student is required to have completed a two-part oral examination in order to be admitted to candidacy for the Ph.D. degree. The purpose of these examinations is for the student to demonstrate competence in the field of major interest and in related fields of biology. The major remaining requirement for the Ph.D. degree is the satisfactory completion of a dissertation consisting of original research carried out under the guidance of a faculty member.

Close collaboration with members of the Department of Chemistry is a vital and stimulating aspect of the biology program. Additional strength and breadth in biology are gained by collaborating with the Department of Marine Biology of the Scripps Institution of Oceanography, with the Scripps Clinic and Research Foundation, and with the Salk Institute for Biological Studies.

## Joint Doctoral Program with San Diego State University

The Department of Biology at UCSD participates in a joint graduate program with the Department of Biology at SDSU, primarily in the areas of cell and molecular biology, and leading to the Ph.D. degree in biology. Graduate student participants in the joint doctoral program are required to spend one year enrolled at UCSD; thesis research is carried out under the supervision of the SDSU faculty.

Information regarding admission is found in the current edition of the Bulletin of the Graduate Division of San Diego State University. Applicants to the UCSD Department of Biology graduate program who check the square marked "joint doctoral program" as well as the one marked "doctorate" will be considered for admission to both programs.

### Courses

**NOTE: The department will endeavor to offer the courses as outlined below; however, unforeseen circumstances sometimes mandate a change of scheduled offerings, especially the quarter offered (F,W,S). Students are strongly advised to check the Schedule of Classes or with the department's Student Services Office (rm. 1208, Muir Biology Bldg., (619) 534-0557) before relying on the following schedule.**

#### Lower Division

##### 1. The Cell (4)

An introduction to cellular structure and function, to biological molecules, bioenergetics, to the genetics of both prokaryotic and eucaryotic organisms, and to the elements of molecular biology. Three hours of lectures and one hour of recitation. *Prerequisites: two quarters of general chemistry; the second quarter of chemistry may be taken concurrently. Required of all biology majors.* (F,W,S)

##### 2. Multicellular Life (4)

An introduction to the development and the physiological processes of plants and animals. Included are treatments of reproduction, nutrition, respiration, transport systems, regulation of the internal environment, the nervous system, and behavior. Three hours of lecture and one hour of recitation. *Prerequisite: Biol. 1.* (W,S)

##### 3. Organismic and Evolutionary Biology (4)

The first principles of evolutionary theory, classification, ecology, and behavior; a phylogenetic synopsis of the major groups of organisms from viruses to primates. Three hours of lecture and one hour of demonstration. *Prerequisite: Biol. 1 or a full year of high school biology.* (F,W)

##### 10. Fundamental Concepts of Modern Biology (4)

An introduction to the biochemistry and genetics of cells and organisms; illustrations are drawn from microbiology and human biology. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. (Students may not receive credit for Biol. 10 after receiving credit for Biol. 1.) (F,S)

##### 11. Introduction to Molecular and Cell Biology (4)

An introduction to the chemical basis of living systems, the chemistry and biology of macromolecules, their organization and function in cells, and the molecular basis of evolution, differentiation, and reproduction. *Prerequisites: Chem. 5A and 5B, or the equivalent.* (S)

##### 12. Neurobiology and Behavior (4)

An introduction to the organization and functions of the nervous system; topics include molecular, cellular, developmental, systems, and behavioral neurobiology. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: Biology 10 or equivalent.* (W)

##### 13. Human Nutrition (4)

A survey of our understanding of the basic chemistry and biology of human nutrition; discussions of all aspects of food: nutritional value, public health, and public policy. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: Biology 10 or equivalent.* (W)

##### 14. Human Physiology (4)

Introduction to the elements of human physiology and the functioning of the various organ systems. A survey of human evolution, nutrition, disease, and environmental adaptation. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: Biology 10 or equivalent.* (S)

##### 15. Biomedicine/Microbes (4)

General principles of microbiology with emphasis on the cell biology of microorganisms and of the cells with which they interact in causing diseases of man and animals. A discussion of infection by bacteria, fungi, and viruses, and host responses to infection. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: Biology 10 or equivalent.* (S)

##### 16. Biology of Human Reproduction (4)

The topics covered are: sexual development in embryo and fetus; the nature and regulation of changes at puberty; the functioning of the mature sexual system. Three hours of lecture. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: Biology 10.* (W)

##### 18. Biomedicine/Cancer (4)

An introduction to molecular, cellular, and immunological aspects of cancer and a consideration of the sociological and psychological impact of cancer on the individual and general society. Three hours of lecture. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: Biology 10.* (S)

##### 23. Horticulture and Animal Husbandry (4)

The practical and theoretical aspects of plant and animal propagation, maintenance, and behavior in a typical Southern California farm community. Animals to be studied include bees, rabbits, sheep, goats, pigs, horses, chickens, ducks, geese, and turkeys. Behavioral and social aspects will be emphasized. Plants to be studied include a variety of fruit trees, bushes, and vegetables. Emphasis will be on propagation and culture conditions. Each student will choose a principal project and area of study. One hour lecture and fourteen hours farm work, research and/or study per week. Oral reports and final paper required. (Not offered in 1987-88.)

##### 50. Information Programming for Life Scientists (4)

This course relates computer programming to life science concepts such as evolution, population dynamics, and communication. Students learn the BASIC language and carry out projects centering on learning, DNA, coding, optimization, and ecological simulation. Three hours of lecture and two hours of laboratory. (F,W)

#### Upper Division

### BIOCHEMISTRY

##### 101. Biochemistry 1 (4)

An introduction to biochemistry covering: protein structure, enzyme catalysis, and allosteric regulation; energy-

producing pathways — glycolysis, the TCA cycle, oxidative phosphorylation, and fatty acid oxidation; and biosynthetic pathways — gluconeogenesis, glycogen synthesis and fatty acid biosynthesis. Three hours of lecture and one hour of recitation. *Prerequisites: two quarters of organic chemistry (second quarter may be taken concurrently).* (NOTE: Students may not receive credit for both Biol. 101 and Chem. 114B.) (F,W,S)

##### 102. Biochemistry 2 (4)

Continuation of Biochemistry 1. Topics will include biosynthesis and oxidation of amino acids and nucleotides, the urea cycle, nitrogen fixation, and photosynthesis; serine proteases and blood coagulation; macromolecular assembly and biochemistry of collagen, elastin, and complex carbohydrates; and hormonal regulation of calcium and skeletal homeostasis. Three hours of lecture and one hour of recitation. *Prerequisite: Biol. 101.* (W)

##### 103. Biochemical Techniques (4)

A laboratory-lecture course in the application of biochemical methods to biological problems. Two hours of lecture per week during first five weeks only (ten hours altogether during the quarter) and ten hours of laboratory. *Prerequisite: Biol. 101 (may be taken concurrently).* (NOTE: Students may not receive credit for both Biol. 103 and Chem. 112A.) (F,W,S) **Note: Students will be admitted to Biology 103 on a priority basis only. Go to room 1208, Muir Biology Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office on their preferred enrollment date will not be considered for priority preference.**

##### 104. Physical Biochemistry (4)

The theory and applications of physical chemistry to biological molecules, process and systems and techniques used in biochemistry and physiology. Topics include reversible and irreversible thermodynamics, bioenergetics, energy coupling and transduction, solutions of macromolecules, sedimentation, chromatography, electrophoresis, passive and active membrane transport, spectroscopy and chemical kinetics. Three hours of lecture and one hour of recitation. *Prerequisites: calculus and organic chemistry.* (F)

##### 106. Molecular Biology (4)

Molecular analysis of gene action: DNA structure, replication, transcription, protein synthesis. Regulation of gene activity. Recombination, mutation, and introduction to genetic engineering. Emphasis on prokaryotes, but with discussion of eucaryotes. Three hours of lecture and one hour of recitation. *Prerequisites: Biology 101 and 131.* (NOTE: Students may not receive credit for both Biol. 106 and Chem. 114C.) (W,S)

##### 107. Nutrition (4)

Emphasis is on the biochemical aspects of nutrition. The known functions of vitamins, minerals, fats, carbohydrates, and protein will be discussed in terms of experiments in nutrition and an evaluation of the relation of the knowledge to nutrition in man. Three hours of lecture. *Prerequisite: Biol. 101.* (W)

##### 108. Immunochemistry (4)

Discussion of antibodies, antigens, complement, and their interactions. Three hours of lecture. *Prerequisites: Biol. 101 and senior status.* (S)

##### 109. Topics in Biophysics/Photobiology (4) (Same as Physics 153.)

Basic principles of photobiology and photochemistry. Photochemical mechanisms in photosynthesis. Photoreceptor pigment systems and photobiological control mechanisms in living organisms. *Prerequisite: upper-division standing in biology, chemistry or physics, or consent of instructor.* (S)

### CELL BIOLOGY

##### 111. Cell Biology (4)

The structure and function of cells and cell organelles, cell growth and division, motility, cell differentiation and specialization. Three hours of lecture and one hour of recitation. *Prerequisites: Biol. 101 and Biol. 131; Biol. 106 recommended.* (F,S)

##### 112. Cell Biology Laboratory (4)

A laboratory course in the application of cellular techniques to biological problems. Ten hours of laboratory. *Prerequisite: consent of instructor and Biol. 111 (may be taken concurrently).* (F) **Note: Students will be admitted to Biology 112**



on a priority basis only. Go to room 1208, Muir Biology Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office on their preferred enrollment date will not be considered for priority preference.

#### 113. Immunology (4)

This course will cover both cellular and humoral aspects of the immune response. Topics include antibody structure, function and gene regulation, T cell regulation of antibody production, T cell responses including transplantation reactions, delayed hypersensitivity and antigen recognition, antigen presentation and immune tolerance. Three hours of lecture. *Prerequisites: Biol. 101, Biol. 106, upper-division standing.* (W)

#### 114. Membrane Biology (4)

Biophysical and biochemical properties of membranes in prokaryotic and eukaryotic cells. Membrane structure and dynamics. Biosynthesis and assembly of membrane components. Molecular mechanisms of solute transport. Biophysics of excitable membranes and membrane receptors. Mechanisms of energy coupling and active transport. Regulation of membrane enzymes. Cellular motility and chemotaxis. Emphasis on certain subjects will vary from year to year to discuss the most recent developments. Three hours of lecture. *Prerequisite: Biol. 101; Biol. 104 is strongly recommended.* (W)

#### 115. Endocrinology (4)

Topics will be: hormone biosynthesis, metabolism and mechanisms of action; neuroendocrinology, regulation of intermediary metabolism and body size, water and electrolyte, calcium and phosphate homeostasis. This course is restricted to upper-division students. Three hours of lecture and one hour of discussion. *Prerequisite: Biology 101 (may be taken concurrently).* (S)

#### 116. Molecular Basis of Disease (4)

An examination of the molecular bases for specific diseases including genetic and physiological disorders as well as bacterial and viral infections. The emphasis will be upon applying the principles of biochemistry and molecular biology to an understanding of disease. Medical considerations will be covered by substantial participation in the lecture schedule by faculty from the School of Medicine. Three hours of lecture. *Prerequisite: Biol. 111 (may be taken concurrently).* This course will be restricted to upper-division biology majors. (S)

## DEVELOPMENTAL BIOLOGY

#### 121. Developmental Biology (4)

The basic processes in embryogenesis will be considered in a variety of organisms at the levels of tissue, cellular, and molecular differentiation. The mechanisms of development will be explored. More detailed analyses of a few processes such as fertilization, sex determination, and pattern formation in *Drosophila* will be discussed. This course open to upper-division students only. Three hours of lecture and one hour of recitation. *Prerequisites: Biol. 101, Biol. 106, Biol. 131.* (S)

#### 122. Human Reproduction and Development (4)

This course is addressed to the development of the human sexual system including gametogenesis, fertilization, and embryo implantation. Emphasis is placed on the physiology of reproductive functions. Three hours of lecture. *Prerequisites: Biol. 101 and Biol. 131.* (F)

#### 123. Embryology Laboratory (4)

Descriptive and experimental embryology of marine organisms and of vertebrates. One and one-half hours of lecture and eight hours of laboratory. *Prerequisites: upper-division standing, Biol. 1 and Biol. 2 or the equivalent, and consent of the instructor.* (F) **Note: Students will be admitted to Biology 123 on a priority basis only. Go to room 1208, Muir Biology Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office on their preferred enrollment date will not be considered for priority preference.**

#### 124. Developmental Physiology of Plants (4)

The development of plants is examined from embryogenesis through reproduction and aging. Emphasis is placed on those aspects of development which can be understood in biochemical terms. Embryogeny, seed formation, germination, the action of plant hormones, photosynthesis, and senescence are studied. Three hours of lecture. *Prerequisite: Biol. 101; Biol. 111 is helpful.* (W)

#### 125. Regulation of Gene Activity in Eucaryotic Cells (4)

This course will explore problems in the regulation of gene activity in eucaryotic cells approached at the molecular level. The course will include the organization, structure, transcription, and regulation of eucaryotic genes, mechanism of hormonal regulation in controlling gene activity, induction of gene expression in eucaryotic cells, and regulation of gene activity during differentiation in developing systems. Examples will be taken from eucaryotic microorganisms, invertebrates, as well as mammalian and other vertebrate systems. Three hours of lecture. *Prerequisite: Biol. 106.* (S)

## GENETICS

#### 131. Genetics (4)

An introduction to the principles of heredity in diploid organisms, fungi, bacteria, and viruses. Mendelian inheritance; population genetics; quantitative genetics; linkage; sex determination; meiotic behavior of chromosome aberrations; gene structure, regulation, and replication; genetic code. Three hours of lecture and one hour of recitation. *Prerequisite: Biol. 1 or the equivalent.* (F,W,S)

#### 132. Eucaryotic Genetics Laboratory (4)

This course emphasizes the principles of Mendelian inheritance and will require the student to apply both cytological and genetic analysis to the solution of problems of transmission genetics. One hour of lecture and seven hours of laboratory. *Prerequisite: Biol. 131 (may not be taken concurrently).* (S) **Note: Students will be admitted to Biology 132 on a priority basis only. Go to room 1208, Muir Biology Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office on their preferred enrollment date will not be considered for priority preference.**

#### 134. Topics in Human Genetics (4)

An advanced course covering aspects of human genetics in detail, and using papers from the scientific literature as the major source of information. The exact topic will change from time to time. Recent examples are sex chromosomes, sex determination, developmental genetics, and the structure of the genome. *Prerequisite: Biol. 131 (may not be taken concurrently).* (F)

#### 136. Microbial Genetics (4)

Organization and function of prokaryotic genetic systems including sex factors, transduction, transformation, phage genetics, transposons, genetic engineering. Three hours of lecture. *Prerequisites: Biol. 106, Biol. 131, and consent of instructors.* (W)

#### 137. Microbial Genetics Laboratory (4)

A laboratory lecture course emphasizing the genetics of bacteria, bacterial viruses, and principles of genetic engineering. One hour of lecture, one hour of discussion, and eight hours of laboratory. *Prerequisites: Biol. 131 and Biol. 136 or consent of instructor.* (S) (Not offered in 1987-88.)

#### 138. Recombinant DNA Techniques (4)

Theory and practice of DNA cloning. This course aims at providing practical knowledge in the field of genetic engineering. Techniques covered include: construction of plasmid and phage DNA libraries, screening libraries for desired DNA clones by hybridization methods, plasmid and phage DNA preparation and DNA sequencing. Two hours of lecture, one hour of discussion, and eight hours of laboratory. *Prerequisites: Biol. 136 and consent of instructor.* (S) **Note: Students will be admitted to Biology 138 on a priority basis only. Go to room 1208, Muir Biology Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office on their preferred enrollment date will not be considered for priority preference.**

## MICROBIOLOGY

#### 141. Bacteriology (4)

A discussion of the structure, growth, genetics, and physiology of prokaryotic microorganisms with emphasis on the diverse activities of bacteria and on the interaction of various bacterial species with their environment. Three hours of lecture and one hour recitation. *Prerequisites: organic chemistry; Biol. 101 (may be taken concurrently).* (F)

#### 142. Laboratory in Microbiology (4)

This course emphasizes fundamental principles of microbiology. Studies with bacteria include comparative morphology

and physiology; pure culture techniques; bacterial growth; spore germination; and bacteriophage infection, replication, and release. Studies with fungi include analysis of vegetative morphology and of heterokaryons of *Neurospora*. One hour of demonstration and seven hours of laboratory. *Prerequisites: Biol. 141 and consent of instructors.* (W) **Note: Students will be admitted to Biology 142 on a priority basis only. Go to room 1208, Muir Biology Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office on their preferred enrollment date will not be considered for priority preference.**

#### 143. Virology (4)

An introduction to prokaryotic and eukaryotic virology with emphasis on animal virus systems. Topics discussed include the molecular structure of viruses, the multiplication strategies of the major virus families, and viral latency, persistence, and oncology. Three hours of lecture. *Prerequisite: Biol. 106.* (W)

#### 144. Medical Microbiology (4)

This course covers basic principles and detailed aspects of microbial infectious diseases. Biochemical properties underlying microbial spread, host response, immunity, and recovery will be emphasized. Emphasis is placed upon viral and bacterial diseases including molecular principles of antibody action, drug resistance, and viral and plasmid replication. Three hours of lecture. *Prerequisites: Biol. 106 and Biol. 141; recommended: Biol. 113.* (S)

## PHYSIOLOGY

#### 151. Mammalian Physiology 1 (4)

Lecture course covering nervous, muscular, cardiovascular, hormonal, and reproductive systems. Three hours of lecture. This course will be restricted to upper-division students. *Prerequisites: Biol. 1, Biol. 2 and Biol. 101.* (F)

#### 152. Mammalian Physiology Laboratory 1 (4)

Topics covered will include membrane physiology, nerve-muscle function, cardiovascular physiology, and endocrine physiology. Cell and organ functions are studied in humans and experimental animals. One hour of lecture and ten hours of laboratory. *Prerequisite: consent of instructor and Biol. 151 (may be taken concurrently).* (F) **Note: Students will be admitted to Biology 152 on a priority basis only. Go to room 1208, Muir Biology Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office on their preferred enrollment date will not be considered for priority preference.**

#### 153. Mammalian Physiology 2 (4)

Lecture course covering respiratory, excretory, and gastrointestinal systems. Emphasis is placed on interactions of organ systems for the regulation of body functions. Three hours of lecture. This course will be restricted to upper-division students. *Prerequisite: Biol. 151 or consent of instructor.* (W)

#### 154. Mammalian Physiology Laboratory 2 (4)

Experiments are performed on the respiratory, excretory, and gastrointestinal systems in experimental animals and humans. Two hours of lecture and ten hours of laboratory. *Prerequisite: consent of instructor and Biol. 153 (may be taken concurrently).* (W) **Note: Students will be admitted to Biology 154 on a priority basis only. Go to room 1208, Muir Biology Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office on their preferred enrollment date will not be considered for priority preference.**

#### 155. Comparative Physiology (4)

Structure and function of invertebrate and vertebrate physiological systems. Three hours of lecture and one hour of section. *Prerequisites: Biol. 1, Biol. 2, and Chem. 6A-B-C or Chem. 7A-B.* (W)

#### 156. Neurobiology (4)

An examination of the properties and functions of individual nerve cells as well as mechanisms of sensory and motor integration. This course open to upper-division students only. Three hours of lecture. *Prerequisites: Biol. 1, Biol. 2, and Biol. 101.* (S)

#### 157. Neurobiology Laboratory (4)

Current electrophysiological techniques used to study nervous systems will be taught through exercises and individual projects. One hour of lecture and ten hours of laboratory. Stu-

## BIOLOGY

dents must be interviewed by instructors before registering in this course. *Prerequisite:* Biol. 156 (may be taken concurrently). (S)

## ECOLOGY, BEHAVIOR, AND EVOLUTION

### 162. Ecology (4)

An examination of the interactions between species in biotic communities, covering theory and laboratory and field studies. Emphasis will be on evolutionary ecology and how natural selection has shaped competitive, predator-prey, and symbiotic relationships in natural communities. Three hours of lecture and two hours of section. *Prerequisite:* Biol. 3; Biol. 131 recommended. (W)

### 163. Population Genetics (4)

The course will cover principles of population and evolutionary genetics. Specific topics to be covered will include selection, finite population size and genetic drift, and pedigree analysis. An introduction to ideas in quantitative genetics will be illustrated with applications to evolutionary problems such as life histories, sexual selection, and macroevolution. Course structure will include a mid-term, final exam, and homework problem sets. *Prerequisite:* Biol. 131. (F)

### 164. Sociobiology (4)

A survey of the patterns of social behavior in invertebrates and vertebrates, including man, and a discussion of the ecological principles underlying the evolution of animal societies. Three hours of lecture and one hour of recitation. *Prerequisite:* Biol. 3. (Offered in even years only.) (W)

### 165. Systems Biology (4)

Introduction to the mathematical and systems analysis modeling of dynamic biological systems, such as growth, development, disease transmissions, genes in populations, and ecological interactions. Three hours of lecture. *Prerequisite:* Biol. 50 or the equivalent. (S)

### 166. Animal Communication (4)

The study of the evolution of communication in animals, including ethological approaches to communication, mechanisms of signal generation, propagation and detection, and economic theories of signal function and evolution. Laboratories will demonstrate methods of signal analysis and field study. Three hours lecture and four hours of lab. *Prerequisite:* Biol. 3. (Offered in odd years only.) (W) NOTE: Biology 166 will satisfy a lab requirement for the ecology, behavior, and evolution major only. For all other biology majors this course will count as an upper-division elective.

### 167. Evolution (4)

Evolutionary processes are discussed in their genetic and ecological contexts. Microevolution, macroevolution, molecular evolution, population genetics, the evolution of adaptations. Three hours of lecture and one hour of recitation. *Prerequisite:* Biology 131 or equivalent. (S)

### 168. Field Ecology and Behavior (4)

Derivation and applications of quantitative methods in field behavior and ecology including analysis of spatial pattern, population size, allometry, demography, and behavioral sequencing. Three hours' lecture and one hour workshop. Statistics background recommended but not required. *Prerequisite:* one upper-division course in ecology, behavior, or evolution; must be taken concurrently with Biology 168L. (F)

### 168L. Lab in Field Ecology and Behavior (4)

Field and laboratory projects using methods outlined in Biology 168. Course emphasizes sampling methods in field conditions, computer competence, and fluency with statistical packages such as Minitab. Two scheduled labs per week, but twenty hours' lab/field time more typical. *Prerequisite:* must be taken concurrently with Biology 168. (F)

### 170. Research in Field Ecology (16)

An intensive course designed to 1) acquaint students with the biota of natural communities in the southwestern U.S. and Mexico; 2) equip them with the methods necessary to solve ecological problems; and 3) refine their abilities to conduct independent research in the field in spite of climate, demanding logistics, and the web of entangling and uncontrolled variables. Students will be away from the campus on field trips for most of the quarter. Enrollment limited to eight students. *Prerequisites:* Biol. 161, Biol. 162, Biol. 168 and consent of instructor. (S)

### 172. Research in Field Behavior (8-12)

This course provides an opportunity for experienced students to participate in a team study of sage grouse mating behavior in the eastern Sierras. Students are presumed to have background in statistics and field techniques, and are expected to develop and direct one sub-area of the study themselves. The course requires full residence in the study site for most of the quarter, with some time on campus for analysis of data and write-up at the end of the quarter. The study will include exposure to radio-tracking, field sampling of behavior, energetic studies, and statistics. Enrollment limited to six students per quarter. *Prerequisites:* any of Biol. 161-171 and consent of instructor. (S)

## SPECIAL COURSES

### 181. Computer Programming in Biology (4)

Use of computer programming in the analysis and presentation of biological data (computation of best value and standard deviation, histogram, least squares fitting procedure, simulation of genetic experiments, etc.) Students will learn the FORTRAN computer language and will run their programs at the Computer Center. There will be some visits to laboratories and hospitals to see applications of computers in biology and medicine. Three hours of lecture and about ten hours of homework per week; limited enrollment. *Prerequisites:* Math. 2A and 2B, or equivalent. (NOTE: Students may not receive credit for both Biol. 181 and Chem. 134.) (F)

### 185. Marine Biochemistry (4)

Examines the effect of low temperatures and high pressure on life processes. Effect of life without oxygen on metabolic and enzymatic mechanisms. Extensive summary of the enzymology of light-emitting organisms in the oceans. Factors affecting primary productivity of the oceans will be presented. *Prerequisite:* Biol. 101 or Chem. 114B (may be taken concurrently). (W)

### 190. Advanced Biology Seminars for Seniors (2)

Experts in diverse areas of biology from major universities in the U.S. and abroad will describe current research activities being conducted in their laboratories. Relevant readings will be assigned. P/NP grades only. *Prerequisites:* seniors only, concurrent enrollment in Biol. 199, or consent of instructor. (F,W,S)

### 195. Introduction to Teaching in Biology (4)

Introduction to the teaching of the basic course in biology. A student under the direction of the instructor of the course will be assigned one class section and will meet one time per week with the section. A student will also be required to attend the lecture in the course and to meet at least one time per week with the instructor of the course. Limited to upper-division students who have a B average or higher. Three hours' lecture. (P/NP grades only.) *Prerequisites:* consent of instructor and approval of department chairperson. NOTE: Applications for a Biology 195 are to be submitted to, and approved by, the Department of Biology prior to the eighth week of the quarter preceding the quarter in which the Biology 195 will be completed. No requests to be a teaching assistant will be accepted after that date. (F,W,S)

### 196. Honors Thesis in Biology (4)

Senior thesis research program. Research is conducted under the supervision of a biology faculty member. This one-year program is taken in addition to the major requirements for graduation. Upon satisfactory completion of the program students will receive "Distinction in Biology" on their transcripts. *Prerequisites:* senior standing, 3.7 GPA or above; prior selection for the program by a faculty member and approval by program coordinator. A department stamp will be used to monitor during registration. (F,W,S)

### 198. Directed Group Study (2 or 4)

This course will cover a variety of directed group studies in areas not covered by formal departmental courses. (P/NP grades only.) *Prerequisite:* upper-division standing. (F,W,S)

### 199. Independent Study for Undergraduates (4)

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisites:* overall UCSD G.P.A. of at least 3.0, minimum of 90.0 units, consent of instructor, and approval by department chairperson. NOTE: Applications for a Biology 199 must be submitted to, and approved by, the Department of Biology prior to the eighth week of the quarter preceding the quarter in which the Biology 199 will be completed. No Biology 199 application forms will be accepted after that date. (F,W,S)

## Graduate

### 200. Seminar in Biology (1)

Invited speakers from the U.S. and abroad, who are leaders in various aspects of biological research, will describe their current research. *Prerequisite:* graduate standing. (S/U grades only.) (F,W,S)

### 201. Seminar in Genetics (1)

Different restricted aspects of genetics will be discussed in detail each quarter; students will participate in the presentation of material; student presentations being prepared in consultation with the responsible faculty member. *Prerequisite:* consent of instructor. (S/U grades permitted.) (F,W,S)

### 202. Seminar in Developmental Biology (1)

Seminars presented by graduate students which will explore topics in specialized areas of developmental biology and provide opportunities for students to gain experience in the organization, critical evaluation, and oral presentation of information from the literature. *Prerequisite:* consent of instructor. (S/U grades permitted.) (Quarter offered is variable, and course is not offered every year.)

### 203. Seminar in Immunology (1)

The course involves weekly seminars given by faculty, post-doctoral research fellows, and advanced graduate students concerning current research in immunology and immunology-chemistry. One hour of lecture. *Prerequisite:* consent of instructor. (S/U grades only.) (W)

### 204. Seminar in Population Biology (1)

Weekly meetings to review current literature on a specified topic in ecology, evolution, or population genetics. Interested students should check with Population Biology office prior to each quarter for topic. Open to qualified undergraduates as well as graduate students with consent of instructor. (F,W,S)

### 205. Seminar in Microbial Physiology (1)

Weekly seminars and discussions led by faculty, post-doctoral fellows, and graduate students concerning recent research in the areas of structure and function of microbial cell surfaces and morphogenesis in microorganisms. *Prerequisite:* consent of instructor. (S/U grades permitted.) (S)

### 206. Topics in Biophysics and Physical Biochemistry (4)

(Same as Physics 206, Chemistry 206.) Selection of topics of current interest. Examples: primary processes of photosynthesis; membrane biophysics; applications of physical methods to problems in biology and chemistry, e.g., magnetic resonance, X-ray diffraction, fluctuation spectroscopy, optical techniques (fluorescence, optical rotary dispersion, circular dichroism). Topics may vary from year to year. *Prerequisite:* consent of instructor. (S/U grades permitted.) (W)

### 207. Seminar Topics in Molecular Biology (1)

Weekly presentation of recent research and developments in molecular biology by faculty, research fellows, graduate students and visitors. *Prerequisite:* graduate standing. (S/U grades only.) (F,W,S)

### 208. Genetics Journal Club (1)

Presentation in historical perspective of current papers of their own choice from the literature of genetics (broadly interpreted) by the participants; presentation of at least one paper required. *Prerequisites:* graduate standing and admission to doctoral research or consent of instructor. (S/U grades only.) (F,W,S)

### 211. Special Topics in Genetics (3)

Provides in-depth coverage of broad topics in the area of genetics. Topics covered in recent years include chromosome behavior, chromosome organization, developmental genetics, and human genetics. Designed for graduate students but open to qualified undergraduates. *Prerequisite:* Biol. 131. (S/U grades only.) (Quarter variable and not offered every year.)

### 212. Special Topics in Microbiology (3)

Recent developments in prokaryotic and eukaryotic microbial research. Topics vary from year to year but may include the following subjects: the molecular basis of (a) sex determination, expression and interconversion; (b) differentiation, morphogenesis, and programmed death; (c) transcriptional and metabolic regulation; and (d) chemical macromolecular and energy-mediated reception, transmission and response proc-



esses. The main thesis of the course is that examples of complex regulatory phenomena in higher organisms can be found in single celled organisms. This course is open to enrollment by undergraduates. *Prerequisites: Biol. 101 and Biol. 131.* (S/U grades permitted.)

**213. Topics in Conservation Biology (3)**

Provides in-depth coverage of topics in population genetics and ecology, community ecology, biogeography, human ecology, and ecosystem management relevant to conservation biology. Topics vary from year to year and have included pedigree analysis, inbreeding depression, minimum viable population size, problems of overabundance, fragmented populations, key-stone species, in-situ and ex-situ conservation techniques. One two-hour meeting weekly. *Prerequisite: graduate standing or consent of instructor.* (S/U grades only.) (S)

**214. Workshop in Behavioral Ecology (3)**

Hands-on experience in the analysis, modelling, and testing of hypotheses in behavioral ecology. Weekly group discussions and out-of-class projects will focus on a different theme (e.g., sexual selection, quantitative genetics, game theory, etc.) each year. Open to qualified undergraduates and graduate students with consent of instructors. (S/U grades only.) (F)

**221A. Advanced Genetics (3)**

Provides a broad, advanced-level coverage of molecular and formal aspects of genetics for first-year graduate students.

Topics covered include bacterial genetics, recombination in prokaryotes and eucaryotes, mammalian somatic-cell genetics, developmental genetics, sex determination, dosage compensation, immunogenetics, etc. Eight hours of lecture-discussion. *Prerequisites: Biol. 101, Biol. 106, and Biol. 131 or the equivalent.* (S/U grades only.) (F)

**221B. Advanced Molecular Biology I (3)**

Provides a broad, advanced-level coverage of modern molecular biology for first-year graduate students. Topics covered include prokaryotic and eucaryotic gene structure and regulation, chromatin structure, DNA replication, translation, mechanisms of transcription, and an introduction to viruses. Three hours of lecture and three hours of discussion. *Prerequisites: Biol. 101, Biol. 106, and Biol. 131 or the equivalent.* (S/U grades only.) (F)

**222A. Advanced Molecular Biology II (3)**

Continuation of Biology 221B and will include, in addition, selected topics in protein chemistry. (S/U grades only.) (W)

**222B. Advanced Virology (3)**

The course will be devoted primarily to animal virology and will consist of a review of fundamental concepts together with an in-depth analysis of the structure, genetics, multiplication and oncogenicity of animal viruses. Particular emphasis will be given to the DNA and RNA tumor viruses. The format of this section will include lectures and discussion of selected papers. (S/U grades only.) (W)

**223A. Advanced Cell Biology (3)**

A coverage of modern cell biology for first-year graduate students. There is an up-to-date discussion of topics such as: structure and function of membranes; structure and function of integral membrane proteins involved in transport, ion pumps, voltage and ligand controlled ion gates, transmembrane signaling; receptor mediated endocytosis; protein synthesis and protein targeting; the role of RER and Golgi apparatus; the biosynthesis of mitochondria, lysosomes, and other intracellular organelles in animal and plant cells; the cytoskeleton and the role of its components in cell structure, motility, cell-cell interactions, and mitosis; the control of cell division (the cell cycle). Six hours of lecture and one hour of discussion of recent papers complementing the lectures. *Prerequisites: Biol. 101, 106, 111, and 131 or the equivalent.* (S/U grades only.) (S)

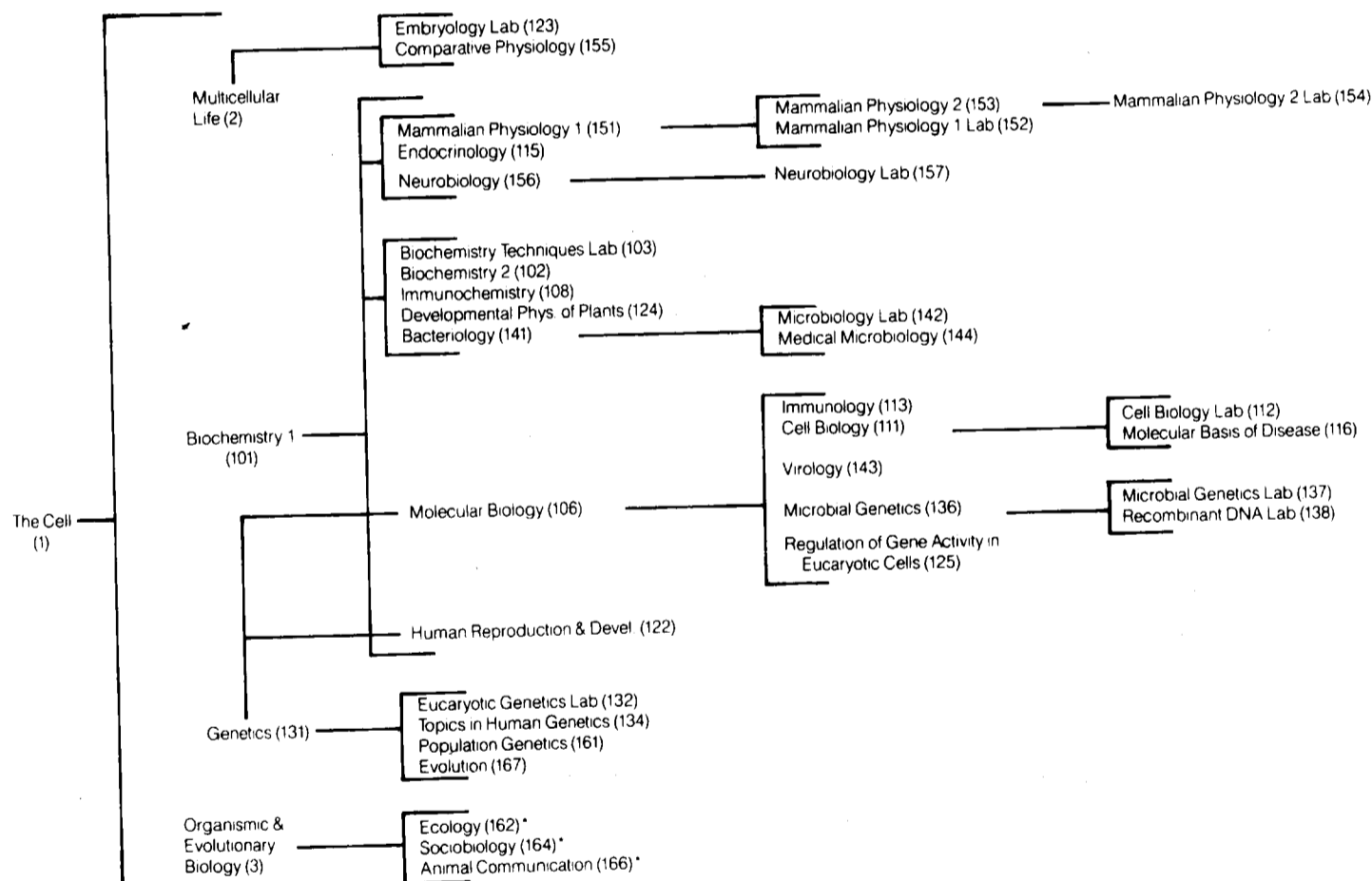
**223B. Advanced Immunology (3)**

The course will be devoted to immunology and will be organized as a combined lecture-tutorial course stressing classical as well as current literature. Each week will compose an independent section. Topics will include cellular interactions involved in the immune response, and the molecular biology unique to lymphoid factor and receptors. (S/U grades only.) (S)

**231. Techniques in Electron Microscopy (3)**

Theoretical aspects of electron microscopy and practical training in basic techniques, including photography. Two or four hours of lecture and ten hours of laboratory. Students

**Prerequisite Flow Chart for Undergraduate Biology Courses**



\*While it is not required, it is recommended that students take Information Programming for Life Scientists (50) and Genetics (131) prior to taking these courses.

Information Programming for Life Scientists (50) — Systems Biology (165)

Population Genetics (163)  
Ecology (162)  
Field Ecology and Behavior (168) — Research in Field Ecology (170)

Any one of the following courses:  
Population Genetics (163)  
Ecology (162)  
Sociobiology (164)  
Systems Biology (164)  
Animal Communication (166) — Research in Field Behavior (172)

In addition to satisfying the prerequisites, students must also have the instructor's consent to enroll in the following courses: Biol. 142, Biol. 157, Biol. 170, and Biol. 172.

NOTE: Students are admitted to the upper-division lab courses on a priority basis. For additional information, please call (619) 534-2580, or go to room 1208 of the Muir Biology Building.

**Students are expected to satisfy the prerequisite requirement prior to enrolling in a course. The only exceptions are those courses in which the prerequisites may be taken concurrently.**

## BIOPHYSICS

may be interviewed before registering in this course. Enrollment limited to eight. Prerequisite: consent of instructor. (S/U grades only.) (W)

### 232. Virology (3)

This course consists of an in-depth review of selected topics in virology with emphasis on the molecular biology of animal virus multiplication. The format will include lectures and discussion of selected papers. Six hours of class meeting for five weeks. Prerequisite: *Biol. 106 or the equivalent.* (S/U grades permitted.) (W)

### 233. Cellular Immunology (3)

This course covers the molecular and cellular events in the humoral and cellular response to antigen, transplantation biology, the structure and function of the major histocompatibility gene complex, the T-cell receptor, lymphokines, and the induction of immunological tolerance. It serves as the second course in a two-part sequence. May be taken by undergraduates who have taken Part 1 (Biology 113), and by graduate students. (S/U grades permitted.) (S)

### 234. Advanced Cellular Neurobiology (3)

Neural cell types and systematic relationships. Developmental concepts and survey of selected parts of the nervous system. Determination versus expression of neuronal characteristics. Extrinsic cues from cellular and humoral environments, cultural approaches. Bioelectric and biochemical properties of neurons and glia. Axonal growth and formation of synapses. Neuroglia interactions. Prerequisite: *consent of instructor.* (S/U grades permitted.)

### 235. Biology and Biochemistry of Cancer Cells (2)

This course will cover recent advances in cell biology, biochemistry, immunology, and virology as they relate to cancer cells and their interaction with the host. Cancer research specialists from outside will be brought in to discuss the most recent evidence and interpretations in key areas of cancer research. This course will meet two hours per week for lecture and discussion. It will be at an advanced graduate level but will be open to a limited number of seniors (with permission of instructor) on a P/NP basis. (S/U grades only.) (W)

### 241. Membrane Neurophysiology and Biophysics (3)

Morphological, biochemical molecular, and physiological basis for testing potentials, receptor potentials, synaptic potentials, and action potentials. (S/U grades only.) (S) (Offered in a three-year cycle with Biology 242 and 243.)

### 242. Cellular and Synaptic Neurophysiology (3)

Factors which influence the establishment and maintenance of cellular and synaptic function in the nervous system. Emphasis on cellular, developmental, and molecular neurobiology. (S/U grades only.) (F) (Offered in a three-year cycle with Biology 241 and 243.)

### 243. Systems Neurophysiology (3)

Ways in which neurons are assembled into circuits to achieve perception and patterned movement. (S/U grades only.) (S) (Offered in a three-year cycle with Biology 241 and 242.)

### 244. Topics in Developmental Neurobiology (3)

Weekly presentations of recent papers on the development of the nervous system. (S/U grades only.) (W)

### 245. Readings in Neurobiology (3)

Weekly presentation by faculty and students of recent journal articles. (S/U grades only.) (F,S)

### 246. Neurobiology Seminar (3)

Presentation of current research by local and visiting neurobiologists. (S/U grades only.) (F,W,S)

### 251. Molecular Biology (3)

The first section of this course consists of a review of fundamental concepts in molecular biology together with an in-depth analysis of molecular biological topics of medical importance. The second section covers the structure, genetics, and multiplication of animal viruses with particular emphasis on the DNA and RNA tumor viruses. Other subjects discussed will include viral persistence, latency, and approaches to viral chemotherapy. Three hours of lecture. Prerequisite: *biochemistry.* (Not open to undergraduates.) (S/U grades only.) (F)

### 252. Genetics (3)

Human genetics with emphasis on basic principles. Topics covered include chromosome abnormalities, the mechanisms of dominant and recessive diseases, pedigree analy-

sis, ascertainment of linkage, the interaction of genotype with diseases. Mechanisms of maintaining genetic diversity in human populations will be discussed along with recent approaches to genetic counseling and intervention. Prerequisite: *consent of instructor.* (Not open to undergraduates.) (S/U grades only.) (F)

### 253. Immunology (3)

Graduate students will explore topics in specialized areas of immunochemistry and cellular immunology, antigenic and molecular structure of immunoglobulin molecules; antigen-antibody interactions; cellular events in the humoral and cellular immune responses; translation immunology. Prerequisite: *consent of instructor.* The course is similar in content to Biology 113 but is accelerated in pace. (S/U grades permitted.) (F)

### 254. Cell and Membrane Physiology (3)

This course is a survey covering current subjects in membrane biology relevant to medicine. Subjects to be included: 1) membrane isolation, composition, and structure; 2) consequences of membrane fluidity (mode of action of anesthetics; intercellular communication, exo- and endo-cytosis biogenesis); 3) sensory perception and response (chemo- and energy reception, cellular neurophysiology, muscle physiology); 4) regulation of membrane function (hormone reception, intercellular adhesion, neoplastic transformation). Prerequisites: *biochemistry and genetics.* (S/U grades only.) (F)

### 255. Clinical Correlates (2)

Clinical correlates will stress the close ties between clinical medicine and basic science and the two-way interactions among practicing doctors and research scientists. Most sessions will start with the presentation of a clinical case by an attending practitioner and an analysis by the clinician of the basic principles demonstrated by each case. There will follow an extended period of open discussion between basic scientist, clinicians, and students. Prerequisites: *graduate students only, Biol. 251, Biol. 252, Biol. 253, and Biol. 254 to be taken simultaneously.* (S/U grades only.) (F)

### 271. Advanced Experimental Methods in Biology (4-12)

Advanced laboratory and/or field experience in contemporary biological methodology. Open only to students enrolled in the Integrated Bachelor's/Master's Degree Program. Prerequisites: *consent of instructor and approval of department chairperson.* (Letter grades only.) (F,W,S) NOTE: Applications for a Biology 271 are to be submitted to, and approved by, the Department of Biology prior to the eighth week of the quarter preceding the quarter in which the Biology 271 will be completed. No Biology 271 application forms will be accepted after that date.

### 297. Research Conference (1-3)

Group and individual discussion of research activities and of current literature. Prerequisite: *graduate standing.* (S/U grades only.) (F,W,S)

### 298. Laboratory Projects in Biology (3-12)

An introduction to contemporary laboratory techniques and research interests through independent, original projects under the direction of individual faculty members. Prerequisite: *consent of instructor.* (F,W,S)

### 299. Thesis Research in Biology (1-12)

(F,W,S)

### 500. Apprentice Teaching (4)

This course involves participation in upper-division undergraduate teaching at the level of assuming responsibility for recitation sections or laboratories under the supervision of the responsible faculty member. Some experience in lecturing to upper-division classes will occasionally be provided. (S/U grades only.) (F,W,S)

## BIOPHYSICS

OFFICE: 3430 Mayer Hall,  
Revelle College

The Department of Physics offers an undergraduate and graduate program

which prepares students for a career in biophysics and which leads to the following degrees:

B.S. in physics with specialization in biophysics

B.S. in physics with specialization in biophysics-premedical

C.Phil. in physics (biophysics)

Ph.D. in physics (biophysics)

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation.

## The Undergraduate Program

### Physics Major with Specialization in Biophysics

The upper-division program for physics majors with specialization in biophysics is essentially the same as the standard physics major, with some modification to provide the education in biology and chemistry needed for advanced work in biophysics. Students entering the program with deficient backgrounds in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent rearrangement of the upper-division program will be devised by consultation between the student and the departmental adviser for biophysics.

The following courses are required for the physics major with specialization in biophysics.

(a) Lower-division:

(1) Physics 2A-B-C-D and 2CL-DL; or Physics 3A-B-C-D, 3CL or 2CL, and 2DL. (2) Chemistry 6A-B-C or 7A-B; and Chemistry 8AL-BL. (3) Biology 1. (4) Mathematics 2D-E-F, or 2DA-EA-F, or 3C-D-E.

(b) Upper-division:

(1) Physics 100A-B-C, 105, 110A, 120A-B, 130A-B, 153. (2) Chemistry 131, 140A-B, 143A. (3) Biology 101, 103, 106, 111, 131. (4) Mathematics 110.

(c) Suggested schedule is:

| Fall               | Winter     | Spring     |
|--------------------|------------|------------|
| <b>Junior Year</b> |            |            |
| Phys. 100A         | Phys. 100B | Phys. 100C |
| Phys. 105          | Biol. 131  |            |
| Phys. 110A         | Math 110   | Phys. 120A |
| Chem. 140A         | Chem. 140B | Chem. 143A |
| <b>Senior Year</b> |            |            |
| Phys. 130A         | Phys. 130B | Phys. 153  |
| Phys. 120B         | Chem. 131  | Biol. 103  |
| Biol. 101          | Biol. 106  | Biol. 111  |

## Physics Major with Specialization in Biophysics-Premedical

The upper-division program for physics majors with specialization in biophysics-premedical is essentially the same as the standard physics major, with some modification to provide the education in biology and chemistry needed for the study of medicine. Students entering the program with deficient backgrounds in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent arrangement of the upper-division program will be devised by consultation between the student and the physics departmental adviser for biophysics.

The following courses are required for the physics major with specialization in biophysics-premedical:

- (a) Lower-Division  
 (1) Physics 2A-B-C-D and 2CL-DL; or Physics 3A-B-C-D, 3CL or 2CL, and 2DL. (2) Chemistry 6A-B-C, or 7A-B; and Chemistry 8AL-BL. (3) Biology 1. (4) Mathematics 2D-E-F, or 2DA-EA-F, or 3C-D-E.
- (b) Upper-division:  
 (1) Physics 100A-B-C, 105, 110A, 120A-B, 130A, 153. (2) Chemistry 126 or 131, 140A-B, 143A. (3) Biology 101, 106, 111, 131. (4) Mathematics 110. (5) Restricted elective: one biology course (Biology 121, 122, or 125).
- (c) Suggested schedule:

| Fall               | Winter           | Spring       |
|--------------------|------------------|--------------|
| <b>Junior Year</b> |                  |              |
| Phys. 100A         | Phys. 100B       | Phys. 100C   |
| Phys. 105          | Math. 110        |              |
| Phys. 110A         | Biol. 131        | Phys. 120A   |
| Chem. 140A         | Chem. 140B       | Chem. 143A   |
| <b>Senior Year</b> |                  |              |
| Phys. 120B         |                  | Phys. 153    |
| Phys. 130A         | Chem. 126 or 131 | Restr. Elec. |
| Biol. 101          | Biol. 106        | Biol. 111    |

## The Graduate Program

Research in biophysics is being actively pursued in several departments (e.g., physics, chemistry, biology), which also offer courses in or relevant to biophysics. Students interested in working toward a graduate degree in an area of biophysics receive their degrees from the department of their thesis supervisor.

Graduate students specializing in the area of biophysics within the Department of Physics receive the Ph.D. in physics (biophysics).

## Doctoral Degree Program

The Ph.D. program consists of three components: graduate courses, apprenticeship in research, and thesis research. In addition, all students are expected to participate in the physics undergraduate teaching program. After passing the departmental examination and course requirements, and before completing a dissertation, students are expected to take a total of no fewer than two units of Physics 500 (Physics Instruction). Each unit corresponds to approximately five hours per week for one quarter in laboratory sections, recitation sections, or problem sessions.

Entering students are assigned a faculty adviser to guide them in their program. Many students spend their first year as teaching assistants or fellows and begin apprentice research in their second year. After three years of graduate study, or earlier, they complete the departmental examinations and begin thesis research. There is no foreign language requirement.

### Entrance Testing

An entrance test covering undergraduate physics is given to entering graduate students during registration week for the purpose of enabling the faculty to give them better guidance in their graduate work. Performance on this test has no bearing on the students' status in graduate school.

### Requirements for the Ph.D.

Students are required to pass a written examination, advanced graduate courses, an oral topic examination, a qualifying examination, and a final defense of the thesis as described below.

#### 1. Departmental Written Examination

Biophysics students are required to take a written examination after completing two years of graduate work at UCSD. The examination is on the level of material usually covered in upper-division courses and the graduate courses listed below:

##### Fall

- Phys. 200A (Theoretical Mechanics)
- Phys. 203A (Adv. Classical Electrodynamics)
- Math. 210A (Mathematical Methods)

##### Winter

- Phys. 200B (Theoretical Mechanics)
- Phys. 203B (Adv. Classical Electrodynamics)
- Phys. 212A (Quantum Mechanics)

##### Spring

- Phys. 210A (Statistical Mechanics)
- Phys. 212B (Quantum Mechanics)
- Math. 210C (Mathematical Methods)

The examination is offered twice a year, at the beginning of the fall and spring quarters, and lasts two days, four hours per day. The examination may be repeated once, the next time it is offered.

#### 4. Qualifying Examination and Advancement to Candidacy

In order to be advanced to candidacy, students must have met the departmental requirements and obtained a faculty research supervisor. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council. The committee conducts the Ph.D. qualifying examination during which students must demonstrate the ability to engage in thesis research. Usually this involves the presentation of a plan for the thesis research project. The committee may ask questions directly or indirectly related to the project and questions on general physics which it determines to be relevant. Upon successful completion of this examination, students are advanced to candidacy and are awarded the C.Phil. degree.

#### 2. Advanced Graduate Courses

Biophysics students are required to take six courses from biology, biochemistry, chemistry, or physics in consultation with their adviser no later than the end of the third year of graduate work. At least three of these courses must be graduate courses. A 3.0 average in five of the six courses is required. (In lieu of the course requirement, students may petition to take an oral examination covering three areas of physics.)

#### 3. Oral Topic Examination

Biophysics students are required to take an oral topic examination no later than the spring of the third year of graduate work. Three topics of current interest in physics or biophysics are announced two weeks prior to the examination week, and a list of relevant references is supplied. Students select one of the topics and present a one-half hour talk on it to a faculty examination committee. The oral presentation is followed by approximately one hour of questioning generally related to the topic. This examination is offered twice a year, at the beginning of the fall and spring quarters, and may be repeated once, the next time it is offered.

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### 5. Thesis Defense

When students have completed their theses, they are asked to present and defend them before their doctoral committees.

### Courses

Please refer to listings in the Departments of Biology, Biochemistry, Chemistry, and Physics.

## CHEMISTRY

Chairman's Office  
2116 Urey Hall  
Revelle College  
(619) 534-3575  
Student Affairs:  
1001 Urey Hall  
Revelle College  
(619) 534-6870

### Professors:

William S. Allison, Ph.D.  
James R. Arnold, Ph.D.  
Marlene A. DeLuca, Ph.D.  
Edward A. Dennis, Ph.D.  
Russell F. Doolittle, Ph.D.  
Robert C. Fahey, Ph.D.  
Murray Goodman, Ph.D.  
Elvin Harper, Ph.D.  
Martin D. Kamen, Ph.D.  
(*Professor Emeritus*)  
David R. Kearns, Ph.D.  
Joseph Kraut, Ph.D.  
Jack Kyte, Ph.D.  
Katja Lindenberg, Ph.D.  
Douglas Magde, Ph.D.  
Kurt Marti, Ph.D.  
Trevor C. McMorris, Ph.D.  
Stanley L. Miller, Ph.D.  
Hans Oesterreicher, Ph.D.  
Charles L. Perrin, Ph.D.  
Gerhard N. Schrauzer, Ph.D.  
Kurt E. Shuler, Ph.D. (*Chairman*)  
Hans E. Suess, Ph.D.  
(*Professor Emeritus*)  
Susan Taylor, Ph.D.  
Teddy G. Traylor, Ph.D.  
William C. Trogler, Ph.D.  
Regitze R. Vold, Ph.D.  
Robert L. Vold, Ph.D.  
John H. Weare, Ph.D.  
Ernest Wenkert, Ph.D.  
John C. Wheeler, Ph.D.  
Kent R. Wilson, Ph.D.  
Xuong Nguyen Huu, Ph.D.  
Bruno H. Zimm, Ph.D.

### Associate Professors:

F. Thomas Bond, Ph.D.  
(*Provost, Revelle College*)  
Leigh B. Clark, Ph.D.

Mark Thiemens, Ph.D.  
Joseph W. Watson, Ph.D. (*Vice  
Chancellor, Undergraduate Affairs*)

### Assistant Professors:

Adrienne Brian, Ph.D.  
John E. Crowell, Ph.D.  
Daniel J. Donoghue, Ph.D.  
Daniel F. Harvey, Ph.D.  
Joseph O'Connor, Ph.D.  
Jay Siegel, Ph.D.  
John D. Simon, Ph.D.  
T. Don Tilley, Ph.D.

### Adjunct Professors:

Robert W. Holley, Ph.D.  
Frank M. Huennekens, Ph.D.  
Leslie E. Orgel, Ph.D.  
Frederick T. Wall, Ph.D.

### Introduction

The UCSD Department of Chemistry was founded in the 1950s by the late Professor Harold Urey and a group of colleagues who strove to create a department that would stress the fundamentals of chemistry and, at the same time, embrace diverse applications of those principles at the frontiers of knowledge.

The department is divided into two divisions: the Division of Biochemistry and the Division of Chemistry.

Degrees offered include:

#### Division of Biochemistry:

B.A. Chemistry/Biochemistry  
M.S. Chemistry  
Ph.D. Chemistry

#### Division of Chemistry:

B.A. Chemistry  
B.A. Chemistry/Chemical Physics  
B.A. Chemistry/Earth Sciences  
M.S. Chemistry  
Ph.D. Chemistry

(The department normally does not accept students who desire a terminal M.S. degree.)

### Chemistry-Premedical Majors

Either a chemistry/biochemistry major or a chemistry major with appropriate choice of electives provides a strong background for students intending to pursue careers in the medical sciences. Pre-medical students are encouraged to complete the three-quarter 141 organic sequence in their sophomore year. Most medical schools require a full year of organic chemistry. Biology 1 is strongly recommended, along with certain upper-division biology courses, which can be counted toward the major requirements in chemistry.

### General Chemistry

Chem. 5A, 5B is a terminal sequence for non-science/non-engineering majors. Chem. 10 is a one-quarter terminal course. The Chemistry 6 sequence (6A-6B-6C) is intended for science and engineering majors as well as others who need a quantitative course. It satisfies all preprofessional programs. Chem. 4 is a one-quarter preparation for 6A which should be taken only by those whose college adviser so recommends. The Chemistry Honors sequence (7A-7B) is designed for science and engineering majors with strong preparation in science and mathematics who can work at a very rapid pace and complete the introductory curriculum in two quarters. A student intending to major in chemistry can thus begin with 4, 6A or 7A, depending on the level of preparation. A student intending to major in a discipline other than chemistry should consult his or her adviser in the appropriate department to determine which chemistry sequence is recommended.

### Undergraduate Major Programs

#### Lower-Division Requirements for Both Divisions

The following courses must be taken for a letter grade:

1. General Chemistry (Chem. 6A-B-C or Chem. 7A-B) including laboratory (Chem. 8AL-BL) or equivalent.
2. One year of physics (Phys. 2A-B-D\* preferably, or Phys. 1A-B-C). Two units of physics laboratory. Phys. 1AL, 1CL is recommended because of the diversity of topics treated. Phys. 1CL is accessible without Phys. 2C.
3. Calculus through Math. 2D (differential equations), either Math. 2A, 2B, 2C, 2D or Math. 1A, 1B, 1C, 2C (two units), 2D.
4. Chemical physics has additional lower-division requirements. See below.
5. Recommended, but not currently required: Math. 2E and a course in computer programming.

\*Phys. 2C is not required.

#### Upper-Division Requirements

The minimum passing grade is a D, and a minimum of a 2.0 average in the major is required for the degree. Except for inde-

pendent research (Chem. 199) and Chemistry Instruction (Chem. 195), majors may not take chemistry courses on a P/NP basis. Chem. 195 and Chem. 199 must be taken on a P/NP basis.

Transfer students must pass at least sixteen units of upper-division courses at UCSD.

## Division of Biochemistry Chemistry/Biochemistry Major

The following program is designed for biochemistry and premedical students desiring a strong background in chemistry. The core biochemistry offering is a sequence of three quarters of lecture plus one laboratory in the junior year. This is followed by four advanced biochemistry courses in the senior year. These four latter courses may be substituted by certain courses in biology and chemistry.

The complete upper-division requirements are:

- Two quarters of physical chemistry (Chem. 126, 127 recommended; 131, 132 acceptable).
- Three quarters of organic chemistry (normally Chem. 141A-B-C).
- One quarter of inorganic chemistry (Chem. 120A).
- Three quarters of biochemistry (Chem. 114A-B-C).
- Four laboratory courses (Chem. 143A-B, 105A, and one of the following: Chem. 112A, 143C, or 105B).
- Two elective courses from the following list: Chem. 112B, 113, 116, 117, 121, 122, 147.
- Two additional elective courses chosen from among all of the upper-division and graduate courses offered by the Department of Chemistry (in particular Chem. 112B, 113, 213, 116, 117, 121, 122, 147) or from the following list of courses offered by the Department of Biology: Biol. 108, 111, 113, 114, 131, 141, 143, 151, 153, 156. Other electives may be arranged by petition.

Chem. 199 may not be used as a required or elective course for the major. Students are encouraged, however, to take Chem. 199 in their senior year in addition to the above required courses. Any departure from these requirements must be approved by petition. The following schedule is only an example.

## Suggested Program for Division of Biochemistry:

| Fall                                 | Winter  | Spring  |
|--------------------------------------|---|---|
| <b>Freshman Year</b>                 |   |   |
| Chem. 6A                             | Chem. 6B<br>Chem. 8AL                             | Chem. 6C<br>Chem. 8BL                           |
| Math. 2A                             | Math. 2B  | Math. 2C  |
| <b>Sophomore Year</b>                |   |   |
| Chem. 141A<br>Chem. 143A<br>Math. 2D | Chem. 141B<br>Chem. 143B<br>Phys. 2A<br>Phys. 1AL | Chem. 141C<br>Biol. 1*<br>Phys. 2B<br>Phys. 1CL |
| <b>Junior Year</b>                   |   |   |
| Chem. 114A<br>Chem. 126<br>Phys. 2D  | Chem. 114B<br>Chem. 127<br>Chem. 112A             | Chem. 114C<br>Chem. 105A                        |
| <b>Senior Year</b>                   |   |   |
| Chem. 120A<br>Elective               | Elective<br>Elective                              | Elective  |

\*Recommended for premedical students, but not required

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## Division of Chemistry Chemistry Major

The upper-division requirements for the chemistry major are:

- One year of physical chemistry (130, 131, 132). The 126, 127, 128 sequence, although of comparable difficulty, is not intended for chemistry majors.
- One year of organic chemistry (141A-B-C).
- Two quarters of inorganic chemistry (120A, 120B).
- Four laboratory courses (Chem. 143A-B, 105A and one of the following: Chem. 112A, 143C, or 105B).
- Five additional upper-division or graduate courses in chemistry or related areas. At least four of these courses must be other than 195 or 199.

## Suggested Program for Division of Chemistry:

### Chemistry Major:

| Fall                                 | Winter  | Spring                              |
|--------------------------------------|---|-------------------------------------|
| <b>Freshman Year</b>                 |   |                                     |
| Chem. 6A                             | Chem. 6B<br>Chem. 8AL                             | Chem. 6C<br>Chem. 8BL               |
| Math. 2A                             | Math. 2B  | Math. 2C                            |
| <b>Sophomore Year</b>                |   |                                     |
| Chem. 141A<br>Chem. 143A<br>Math. 2D | Chem. 141B<br>Chem. 143B<br>Phys. 2A<br>Phys. 1AL | Chem. 141C<br>Phys. 2B<br>Phys. 1CL |
| <b>Junior Year</b>                   |   |                                     |
| Phys. 2D<br>Chem. 120A               | Chem. 131<br>Chem. 120B                           | Chem. 132<br>Chem. 143C**           |
| <b>Senior Year</b>                   |   |                                     |
| Chem. 130<br>Chem. 105A<br>Elective  | Elective<br>Elective                              | Elective<br>Elective                |

\*\*or 105B or 112A

## Chemistry/Chemical Physics Major

Chemical physics applies the concepts and quantitative methods of physics to the descriptions of atoms and molecules, analyzes matter as a statistical assembly of molecular building blocks, and develops and exploits physical (largely spectroscopic) experimental tools with which to test and refine such theories.

The chemistry/chemical physics major is designed as a preparation for graduate work. It requires completion of Phys. 2A-2D or Phys. 3A-3D, Chem. 7A-7B or Chem. 6A-6C, and the Math. 2 sequence through 2F or 3E by the end of the sophomore year, along with the lower-division labs Chem. 8AL, 8BL and Physics 1AL, 1CL, or equivalent. The upper-division requirements are the same as for the chemistry major, except: Chem. 141C is not required. The four upper-division chemistry labs are: Chem. 105A, 105B, 143A, and 143C. Math. 110, and Phys. 110A, 110B or 100A, 100B, and Chem. 133 or 135 are required, plus two additional courses in physical chemistry or related areas as approved by an adviser.

### Chemical Physics Major:

| Fall  | Winter   | Spring                               |
|---|--|--------------------------------------|
| <b>Freshman Year</b>                                  |  |                                      |
| Chem. 6A<br>Chem. 8AL                                 | Chem. 6B<br>Phys. 2A<br>Phys. 1AL                      | Chem. 6C<br>Phys. 2B<br>Phys. 1CL    |
| Math. 2A  | Math. 2B   | Math. 2C                             |
| <b>Sophomore Year</b>                                 |  |                                      |
| Chem. 141A<br>Math. 2D<br>Phys. 2C                    | Chem. 141B<br>Math. 2E<br>Phys. 2D                     | Chem. 143A<br>Math. 2F               |
| <b>Junior Year</b>                                    |  |                                      |
| Chem. 130<br>Chem. 8BL<br>Phys. 110A<br>or Phys. 100A | Chem. 131<br>Chem. 105A<br>Phys. 110B<br>or Phys. 100B | Chem. 132<br>Chem. 143C<br>Math. 110 |
| <b>Senior Year</b>                                    |  |                                      |
| Chem. 120A<br>Chem. 105B                              | Chem. 120B<br>Elective                                 | Chem. 135<br>Elective                |

## Chemistry Major with Specialization in Earth Sciences

A chemistry major with specialization in earth sciences is also available for undergraduates. See "Earth Sciences" for description of this program, which may be arranged by consultation with advisers in the Department of Chemistry and Scripps Institution of Oceanography.

Normally the student does course work for a major in chemistry, physics or mathematics, plus additional enrichment courses in geology. The required upper-division chemistry courses are: Chem.



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141A, 141B; Chem. 130, 131, 132; Chem. 120A, 120B; Chem. 143A, and Chem. 105A, 105B. The specifically required earth sciences courses are: ES 101, Introduction to Earth Sciences; ES 103, Introduction to Geophysics; ES 102, Introduction to Geochemistry; ES 120, Mineralogy; and SIO 256A, Field Geology. At least two other courses from the following list are required: SIO 244, 245A, 245B, 253, Chem. 120C, 170, 171. Petrology (SIO 253) is essential for geology students. SIO 253 and 245A should be taken by students planning to go on to graduate school or to do professional geologic work with their undergraduate degrees. The courses should be taken in the order given in the suggested program.

### Earth Sciences Major:

| Fall                               | Winter                              | Spring                              |
|------------------------------------|-------------------------------------|-------------------------------------|
| <b>Freshman Year</b>               |                                     |                                     |
| Chem. 6A                           | Chem. 6B<br>Chem. 8AL               | Chem. 6C<br>Chem. 8BL               |
| Math. 2A                           | Math. 2B                            | Math. 2C                            |
| <b>Sophomore Year</b>              |                                     |                                     |
| Chem. 141A<br>Math. 2D             | Chem. 141B<br>Phys. 2A<br>Phys. 1AL | Chem. 143A<br>Phys. 2B<br>Phys. 1CL |
| <b>Junior Year</b>                 |                                     |                                     |
| E.S. 101<br>Phys. 2D<br>Chem. 120A | E.S. 103<br>Chem. 131<br>Chem. 120B | E.S. 102<br>Chem. 132<br>Chem. 105A |
| <b>Senior Year</b>                 |                                     |                                     |
| Chem. 130<br>E.S. 120<br>Elective  | Chem. 105B<br>SIO 256A              | Elective                            |

### Minor Programs in Chemistry

A typical minor in chemistry consists of three lower-division courses, such as Chem. 6A-B-C, followed by a sequence of three upper-division courses focused in physical, inorganic, organic, or environmental chemistry or biochemistry. Courses required by a student's major may not be applied toward a minor. The Warren College program of concentration is similar, but not identical to, a minor.

### Office Contact

The departmental Student Affairs Office is located in 1001 Urey Hall. Majors and prospective majors are encouraged to contact this office.

### The Graduate Program

The department accepts students for study toward the Ph.D. in either the Division of Chemistry or the Division of Biochemistry. The doctoral program is designed to encourage initiative on the part of the student and to develop habits of independent study. Students with normal preparation start research early.

There are some small differences between the Divisions of Chemistry and Biochemistry. Such details, along with comprehensive descriptions of research activities in both divisions, can be found in the Department of Chemistry's graduate brochure.

Students whose native language is not English must submit TOEFL scores. A student must demonstrate a mastery of English adequate to permit him or her to satisfy the teaching requirement. A foreign student must remedy any deficiency before the middle of the second year of residency. There is no foreign language requirement, but it is recommended that a student acquire at least a reading knowledge of one foreign language, preferably German or Russian.

In order that they may participate effectively in this program, entering graduate students will be required to have a mastery of the subjects usually presented in an undergraduate chemistry curriculum. So that students may be properly advised, their mastery of these undergraduate subjects will be tested by written examination on their arrival. Deficiencies in undergraduate preparation must be remedied during the first year of graduate study.

In the first year the student will usually take at least six of the graduate courses listed below, plus Chem. 250, which is required. The student may also take upper-division undergraduate courses. Depending on the student's special interests, he or she may take courses in other departments. In the second year the student will usually carry a lighter load of formal courses, but will continue to participate in seminars and informal study groups.

In the winter quarter of the second year, there is an oral departmental exam covering an area of current research interest. This exam, along with the course work, will usually qualify the student for receipt of the M.S. degree. The oral qualifying exam covering the student's Ph.D. thesis project is taken before the end of the third year. Successfully passing the oral qualifying examination advances the student to candidacy for the Ph.D. The candidate then devotes most of his or her time to thesis research and study. A final examination is conducted by the student's doctoral committee upon completion of the dissertation. The examination is oral and deals with the dissertation and its relation to the general field of study.

All graduate students are required to participate in the graduate teaching program as a part of their educational experi-

ence. Course credit is obtained for this teaching by registration in Chem. 500.

The interdisciplinary tradition is strong on the San Diego campus. The chemistry faculty has close ties with the Departments of Applied Mechanics and Engineering Sciences, Biology and Physics, as well as with the Scripps Institution of Oceanography and the School of Medicine. Facilities are thus available to the graduate student for study or collaboration in a wide variety of interdisciplinary fields.

### Joint Doctoral Program with San Diego State University

The Department of Chemistry at UCSD cooperates with the Department of Chemistry in the Division of the Physical Sciences, San Diego State University, in offering a joint program of graduate study leading to the Ph.D. degree in chemistry.

Information regarding admission is found in the current edition of the Bulletin of the Graduate Division of San Diego State University. Requirements for the Ph.D. are the same as those above except that only one quarter of teaching is required during the first year of residence at UCSD.

## Courses

### Lower Division

#### 4. Basic Chemistry (4)

Chem. 4 is a one-quarter introductory chemistry course for science majors with insufficient preparation for the Chem. 6 sequence. Topics include stoichiometry, kinetic theory, atomic structure, and chemical bonding. Cannot be taken for credit after any other college chemistry course. *Prerequisite:* Math. 4C or Math. 1A (may be taken concurrently). (F,W)

#### 5A. Introductory Chemistry (4)

Chemistry 5A-5B is a two-quarter sequence designed primarily for nonscience majors. Topics include atomic and molecular structure, as well as some organic and biochemistry. Chemistry 5A cannot be taken for credit after Chemistry 4. *Prerequisite:* Math. 4C or Math. 1A (may be taken concurrently). (W)

#### 5B. Introductory Chemistry (4)

Second quarter of a two-quarter sequence designed primarily for nonscience majors. Topics include thermodynamics, chemical equilibria, ionic equilibria, and chemical kinetics. Three hours' lecture, one hour recitation. *Prerequisite:* Chem. 5A. (S)

#### 6A. General Chemistry (4)

First quarter of a three-quarter sequence intended for science and engineering majors. Topics include: stoichiometry, kinetic theory of gases, liquids and solids, equilibrium constants, ionic equilibria. Three hours' lecture, one hour recitation. *Prerequisite:* proficiency in high school chemistry or physics and in high school mathematics; Math. 2A or Math. 1A (may be taken concurrently). (F,W,S)

#### 6B. General Chemistry (4)

Second quarter of a three-quarter sequence intended for science and engineering majors. Topics include: thermodynamics, electrochemistry, chemical kinetics, quantum theory, and atomic structure. Three hours' lecture, one hour recitation. *Prerequisites:* Chem. 6A; Math. 2B or Math. 1B (may be taken concurrently). (F,W,S)



**6C. General Chemistry (4)**

Third quarter of a three-quarter sequence intended for science and engineering majors. Topics include: chemical bonding, chemistry of representative elements and transition metals, introduction to organic, nuclear, and biochemistry. Three hours' lecture, one hour recitation. *Prerequisites:* Chem. 6B, 8AL; Math. 1C or Math. 2C (may be taken concurrently). (F,W,S)

**7A. Honors Chemistry (4)**

First quarter of a two-quarter honors sequence, for science and engineering majors with strong preparation in mathematics and science. Topics include: models for the behavior of gases, liquids and solids, principles of thermodynamics and chemical equilibrium, and representative applications. *Prerequisites:* Math. 2A (may be taken concurrently) and strong high school chemistry and physics. (F)

**7B. Honors Chemistry (4)**

Second quarter of the honors sequence, for science and engineering majors with strong preparation in mathematics and science. Topics include: principles of chemical bonding, with representative application, rates and mechanisms of chemical reactions, and comparisons between theoretical and experimental approaches to solving chemical problems. *Prerequisites:* Chem. 7A and Math. 2B (may be taken concurrently). (W)

**8AL. Quantitative Chemical Analysis (2)**

A laboratory course that introduces the student to laboratory techniques, analytical procedures, and physical measurements. The course includes gravimetric, volumetric, and instrumental methods of chemical analysis with emphasis on accuracy and precision. One lecture and two three-hour laboratories. Registration is usually concurrent with registration in Chem. 6B or in Chem. 7A. (F,W,S)

**8BL. Quantitative Chemical Analysis (2)**

A continuation of Chemistry 8AL. One hour lecture and two three-hour laboratories. Registration is usually concurrent with registration in Chem. 6C or in Chem. 7B. *Prerequisite:* Chem. 8AL. (F,S)

**10. Overview of Chemistry (4)**

This course is intended for nonscience majors. It introduces some of the fundamental concepts and theories of chemistry, including atomic and molecular structure, the nature of chemical reactions and an introduction to organic and biological chemistry. May not be taken for credit after any other college chemistry course. (W)

## Upper Division

**102A. Thermodynamics (4)**

Thermodynamics of chemical systems, the three laws, with emphasis on the formal structure of thermodynamics. Chemical equilibrium, stability theory, heterogeneous equilibrium. Solutions. Intended as a preparation for Chem. 204A. *Prerequisites:* Chem. 131, 132, or equivalent.

**105A. Physical Chemistry Laboratory (2)**

Laboratory course in experimental physical chemistry. *Prerequisites:* Chem. 8BL and Phys. 1CL or equivalent, Chem. 130 or 131 or 126 or 127. (F,W,S)

**105B. Physical Chemistry Laboratory (2)**

Laboratory course in experimental physical chemistry. *Prerequisites:* Chem. 105A and 130. (F,W,S)

**107. Synthetic Macromolecules (4)**

The organic and physical chemistry of high polymers with emphasis on synthesis, structure, characterization, and properties. Polymers as materials are important as films, fibers, and elastomers. They play an ever-increasing role in science, technology, and medicine. *Prerequisites:* Chem. 126 or 131 and 140B or 141B. (W)

**112A. Molecular Biochemistry Laboratory (4)**

The application of techniques, including electrophoresis, peptide mapping and sequencing, affinity chromatography, amino acid analysis, gas-liquid chromatography, and enzyme functions and the chemistry of lipids, carbohydrates, and nucleic acids. *Prerequisites:* Chem. 141A-B-C, 143A-B, 114A-B. (Some of these courses may be taken concurrently.) (NOTE: Students may not receive credit for both Chem. 112A and Biology 103.) (W)

**112B. Molecular Biochemistry Laboratory (4)**

This laboratory will introduce the students to the tools of mo-

lecular biology and will involve experiments with recombinant DNA techniques. *Prerequisites:* Chem. 112A, and 114A-B-C. (Some of these courses may be taken concurrently.) (S)

**113. Chemistry of Biological Macromolecules (4)**

A discussion of the structural principles governing biological macromolecules, the techniques used in their study, and how their functional properties depend on three-dimensional structure. *Prerequisites:* elementary organic and physical chemistry. (S)

**114A. Biochemical Structure and Function (4)**

Introduction to biochemistry from a structural and functional viewpoint. *Prerequisite:* elementary organic chemistry (which may be taken concurrently). (F)

**114B. Biochemical Energetics and Metabolism (4)**

This course is an introduction to the metabolic reactions in the cell which produce and utilize energy. The course material will include energy-producing pathways: glycolysis, Krebs cycle, oxidative phosphorylation, fatty-acid oxidation. Biosynthesis — amino acids, lipids, carbohydrates, purines, pyrimidines, proteins, nucleic acids. *Prerequisite:* Chem. 114A. (NOTE: Students may not receive credit for both Chem. 114B and Biology 101.) (W)

**114C. Biosynthesis of Macromolecules (4)**

This course is a continuation of the introduction to biochemistry courses (114A and 114B). This quarter reviews the mechanisms of biosynthesis of macromolecules — particularly proteins and nucleic acids. Emphasis will be placed on how these processes are controlled and integrated with the metabolism of the cell. *Prerequisite:* Chem. 114B. (NOTE: Students may not receive credit for both Chem. 114C and Biology 106.) (S)

**116. Chemistry of Enzyme Catalyzed Reactions (4)**

A discussion of the chemistry of representative enzyme catalyzed reactions is presented. Enzyme reaction mechanisms and their relation to enzyme structure are emphasized. *Prerequisites:* elementary physical chemistry, organic chemistry, and biochemistry. (W)

**117. Biochemistry of Human Disease (4)**

An advanced course in biochemistry which will deal primarily with the molecular basis of human disorders. *Prerequisite:* elementary biochemistry. (S)

**120A. Inorganic Chemistry (4)**

The chemistry of the main group elements is presented in terms of atomic structure, ionic and covalent bonding. Structural theory involving s, p, and unfilled d orbitals is described. Thermodynamic and spectroscopic criteria for structure and stability of compounds are presented and chemical reactions of main group elements discussed in terms of molecular structure and reactivity. *Prerequisites:* a general chemistry course. Chem 141A or equivalent course is recommended. (F)

**120B. Inorganic Chemistry (4)**

A continuation of the discussion of structure, bonding, and reactivity with emphasis on transition metals and other elements using filled d orbitals to form bonds. Coordination chemistry is discussed in terms of valence bond, crystal field, and molecular orbital theory. The properties and reactivities of transition metal complexes including organometallic compounds are discussed. *Prerequisite:* Chem. 120A. (W)

**120C. Inorganic Chemistry (4)**

The reactivity of molecules is examined from a kinetic and mechanistic point of view. Properties affecting reactivity are examined and case studies of reactions are discussed in detail. *Prerequisite:* Chem. 120B or consent of instructor. (S)

**121. Energy Transduction (4)**

Discussion of current understanding of mechanisms of muscle contractions, photosynthesis, bioluminescence, chemiluminescence, and active transport will be presented. *Prerequisites:* organic chemistry and introductory biochemistry. (S)

**122. Biochemical Evolution (4)**

This course emphasizes the chemical aspects of evolution, including the origin of living systems on earth, primitive energy acquisition devices, the coupling of information storage and replication catalysis, protein evolution, and the biochemical unity and diversity of extant organisms. *Prerequisites:* organic chemistry and introductory biochemistry.

**126. Physical Chemistry (4)**

Thermodynamics, first and second laws, thermochemistry,

chemical equilibrium, phase equilibrium, solutions. *Prerequisites:* Chem. 7B or Chem. 6C, Math. 2C or consent of instructor. (NOTE: Students may not receive credit for both 126 and 131.) (F)

**127. Physical Chemistry (4)**

Electrochemistry, kinetic theory, and reaction kinetics. *Prerequisites:* Chem. 7B or Chem. 6C, Math. 2C and 2D, Chem. 126 or consent of instructor. (W)

**128. Physical Chemistry (4)**

Statistical mechanics, atomic and molecular structure, spectroscopy, solids, x-ray diffraction. *Prerequisites:* Chem. 7B or Chem. 6C, Math. 2C and 2D, Chem. 127, or consent of instructor. (S)

**130. Physical Chemistry (4)**

Quantum mechanics, atomic and molecular spectroscopy, molecular structure. *Prerequisites:* Chem. 7B or Chem. 6C, Math. 2C and 2D, Phys. 2D or equivalent, or consent of instructor. (F)

**131. Physical Chemistry (4)**

Thermodynamics, chemical equilibrium, phase equilibrium, chemistry of solutions. *Prerequisites:* Chem. 7B or Chem. 6C, Math. 2C, 2D, or consent of instructor. (NOTE: Students may not receive credit for both 126 and 131.) (W)

**132. Physical Chemistry (4)**

Chemical statistics, kinetic theory, reaction kinetics. *Prerequisites:* Chem. 7B or Chem. 6C, Math. 2C, 2D, Chem. 131, or consent of instructor. (NOTE: Students may not receive credit for both 127 and 132.) (S)

**133. Elementary Statistical Thermodynamics (4)**

Equilibrium, distribution functions, development of partition functions; derivation of thermodynamic properties of simple systems from partition functions. *Prerequisites:* Chem. 130, 131, 132, Math. 2D. (F)

**134. Computer Programming in Chemistry (4)**

Use of computer programming in the analysis and presentation of chemical data (statistical analysis, least squares fitting procedures, titration curve interpretation, analysis of radioactive decay series, chemical kinetics, organic synthesis, etc.) *Prerequisites:* Math. 2A and 2B or equivalent. (NOTE: Students may receive credit for only one of the following: AMES 10, Biology 181, Chemistry 134.) (W)

**135. Spectroscopy and Structure (4)**

The interaction of electromagnetic radiation with molecules and bulk matter, x-ray and optical scattering; electronic, vibrational and rotational spectroscopy; nuclear and electron magnetic resonance. Emphasis will be placed on the quantum mechanical interpretation of experimental data. *Prerequisite:* Chem. 130. (S)

**140A. Organic Chemistry (4)**

An introduction to organic chemistry, with emphasis on material fundamental to biochemistry. Topics include bonding theory, isomerism, stereochemistry, chemical and physical properties, and an introduction to substitution, addition, and elimination reactions. *Prerequisite:* Chem. 6C or 7B or equivalent course in general chemistry. (NOTE: Students may not receive credit for both 140A and 141A.) (F,W)

**140B. Organic Chemistry (4)**

A continuation of 140A; acid/base reactions, chemistry of the carbonyl group, sugars, peptides, nucleic acids and other natural products. *Prerequisite:* Chem. 140A (a grade of C or higher in Chem. 140A is strongly recommended). (NOTE: Students may not receive credit for both 140B and 141B.) (W,S)

**140C. Organic Chemistry (4)**

A continuation of Chemistry 140A-B. Organic chemistry of biologically important molecules: carbohydrates, proteins, fatty acids, biopolymers, natural products, drugs; models for enzymatic reactions, synthetic methods, and methods of analysis. *Prerequisite:* Chem. 140B. (F,S)

**141A. Organic Chemistry (4)**

Chem. 141A introduces theoretical and experimental studies of structure and properties of covalent molecules. Both resonance and simple molecular orbital descriptions of organic compounds are introduced and spectroscopic methods for determining electronic and molecular structure are discussed. Organic reactions are introduced with synthetic and mechanistic examples. *Prerequisites:* Chem. 7B or 6C (6C may be taken concurrently by good students). Prior or concurrent physics recommended. (F)

## CHEMISTRY

### 141B. Organic Chemistry (4)

A continuation of 141A, this course applies the structure-reactivity, spectroscopy, and electronic theories introduced in 141A to organic reactions. *Prerequisite:* Chem. 141A. (W)

### 141C. Organic Chemistry (4)

A continuation of 141A-B, this course treats selected topics such as carbon-metal bonds, organometallic chemistry, electrophilic reactions, free radical reactions, alkane chemistry, polymerization, molecular orbital theory and electrocyclic reactions, photochemistry, unstable intermediates such as carbenes, benzyne, etc. and metal oxidation reactions, and an introduction to carbohydrate and protein chemistry. *Prerequisite:* Chem. 141B. (S)

### 142. Natural Products Chemistry (4)

An outline of the chemistry of terpenes, steroids, alkaloids, and plant phenols developed on the basis of modern biogenetic theory. Special emphasis will be given to biologically active substances such as hormones and antibiotics. *Prerequisites:* Chem. 140A-B-C, or 141A-B-C. (Not offered every year.)

### 143A. Organic Chemistry Laboratory (2)

Introduction to laboratory techniques needed in organic chemistry. Stresses physical methods including separation and purification, spectroscopy, product analysis and effects of reaction conditions. *Prerequisites:* Chem. 8AL, Chem. 141A or Chem. 140A (may be taken concurrently). (F,W,S)

### 143B. Organic Chemistry Laboratory (2)

Continuation of 143A, emphasizing synthetic methods of organic chemistry. *Prerequisites:* Chem. 143A, 141B or 140B (may be taken concurrently). (W)

### 143C. Organic Laboratory (4)

Identification of unknown organic compounds by a combination of chemical and physical techniques. *Prerequisites:* Chem. 8BL, 143A, 141C (may be taken concurrently). (S)

### 147. Mechanisms of Organic Reactions (4)

A qualitative approach to the mechanisms of various organic reactions; substitutions, additions, eliminations, condensations, rearrangements, oxidations, reductions, free-radical reactions, and photochemistry. Includes considerations of molecular structure and reactivity, synthetic methods, spectroscopic tools, and stereochemistry. The topics emphasized will vary from year to year. This is the first quarter of the advanced organic chemistry sequence. *Prerequisite:* Chem. 141C or 140C. (F)

### 148. Synthetic Methods in Organic Chemistry (4)

A survey of reactions of particular utility in the organic laboratory. Emphasis is on methods of preparation of carbon-carbon bonds and oxidation reduction sequences. *Prerequisite:* Chem. 141C or consent of instructor.

### 149A. Environmental Chemistry (4)

The chemical basis of air and water pollution, solid waste disposal, energy and mineral resource usage, agricultural productivity and biological toxicity. *Prerequisite:* introductory chemistry. (F)

### 167. Biochemistry of Lipid Diseases (4)

The metabolism of lipids from the basic biochemistry to human disease implications will be the central theme of this course. The aim will be first to develop a broad understanding of the basic biochemical aspects of lipid metabolism including structural aspects of lipids and lipoproteins and mechanistic aspects of the enzymes that act upon them. Then the regulation of lipid metabolism and the implications for disease states will be considered. Finally, the application of these ideas to the treatment of specific human diseases will be discussed.

### 170. Cosmochemistry (4)

Composition of stars, of planets, of meteorites, and the earth and moon. Nuclear stability rules and isotopic composition of the elements. Chemical properties of solar matter. Origin of the elements and of the solar system. *Prerequisite:* general chemistry sequence.

### 171. Nuclear and Radiochemistry (4)

Radioactive decay, stability systematics, neutron activation, nuclear reactions. Szilard-Chalmers reactions, hot-atom chemistry, radiation chemistry, effects of ionizing radiation. *Prerequisite:* general chemistry sequence.

### 190. Mathematical Methods of Chemistry (4)

Applied mathematics useful for kinetics, thermodynamics,

statistical mechanics and quantum mechanics. Topics include ordinary and partial differential equations, special functions, probability and statistics, vector functions and operators, linear algebra, and group theory. *Prerequisites:* general chemistry, one year of calculus. (Not offered every year.)

### 195. Chemistry Instruction (1-4)

Introduction to the teaching of elementary college chemistry. Each student will be responsible for and teach a class section of one of the lower-division chemistry courses. Limited to upper-division chemistry majors who have maintained a B average or better in their major course work. One meeting per week with instructor, one meeting per week with assigned class section, and attendance at lecture of the lower-division course in which the student is participating. (P/NP grades only.) *Prerequisite:* consent of instructor. (F,W,S)

### 199. Senior Reading and Research (2-4)

Independent literature or laboratory research by arrangement with, and under the direction of, a member of the Department of Chemistry faculty. Students must register on a P/NP basis. *Prerequisite:* consent of instructor and department. (F,W,S)

## Graduate

### 200A-B. Molecular Quantum Mechanics (4-4)

The fundamental concepts and techniques of quantum mechanics which are useful for problems of chemical interest are developed and applied to the structure, spectra, and properties of molecules. *Prerequisite:* an introduction to quantum mechanics as in a physical chemistry course, for example Chem. 130. A good background in mathematics is helpful, for example Chem. 190. (W,S)

### 202A. Thermodynamics (4)

Thermodynamics of chemical systems; the three laws, with emphasis on the formal structure of thermodynamics. Chemical equilibrium, stability theory, heterogeneous equilibrium, solutions. Intended as a preparation for Chem. 204A. *Prerequisites:* Chem. 131, 132, or equivalent. (F)

### 204A. Statistical Mechanics of Chemical Systems (4)

Equilibrium statistical mechanics, derivation of the formal ensemble equations and the laws of thermodynamics from the principles of classical and quantum mechanics, the relations between the different ensembles, the use of the equations for various chemical systems, gases, crystals, and liquids. *Prerequisite:* Chem. 133 or equivalent, or consent of instructor.

### 206. Topics in Biophysics and Physical Biochemistry (4)

Selection of topics of current interest. Examples: Primary processes of photosynthesis; membrane biophysics; applications of physical methods to problems in biology and chemistry, e.g., magnetic resonance, x-ray diffraction, fluctuation spectroscopy, optical techniques (fluorescence, optical rotary dispersion, circular dichroism). Same as Physics 206. *Prerequisite:* consent of instructor. (S/U grades permitted.) (W)

### 207. Modern NMR Methods (4)

Treats varied pulse sequences, one- and two-dimensional methods, interpretation of relaxation rates, spin-decoupling, multiple quantum filtering, and solvent suppression with application to liquid crystals, membranes, small molecules, proteins, and nucleic acids.

### 209. Special Topics in Chemical Physics (4)

Topics of special interest will be presented. Examples include NMR, solid-state chemistry, phase transitions, stochastic processes, scattering theory, nonequilibrium processes, and advanced topics in statistical mechanics, thermodynamics, and chemical kinetics. (S/U grades permitted.) (F,W,S)

### 210. Seminar in Biochemistry (2)

Seminars presented by graduate students which will explore topics in specialized areas of biochemistry and provide opportunities for students to gain experience in the organization, critical evaluations, and oral presentation of information from the literature. Each quarter a different topic is discussed; recent topics have included: lipids, membranes, oxidative phosphorylation, nucleic acid structure, function, and synthesis, protein structure and function, history of biochemistry. (F,W,S)

### 211. Biochemistry (4)

A comprehensive course in biochemistry emphasizing metabolic and human biochemistry. *Prerequisites:* physical and organic chemistry; graduate-student standing. (F)

### 213. Chemistry of Macromolecules (4)

A discussion of the structural principles governing biological macromolecules, the techniques used in their study, and how their functional properties depend on three-dimensional structure. *Prerequisites:* elementary physical and organic chemistry. (F)

### 214. History of Biochemistry (2)

A summary of the contributions which led to the major concepts in the field of biochemistry. Emphasis will be placed on the research approach taken by eminent individuals. *Prerequisite:* Chem. 211.

### 215. Nutritional Biochemistry (2)

The biochemical basis of human nutrition will be emphasized. *Prerequisites:* Chem. 211, which may be taken concurrently; graduate-student standing. (F)

### 216. Chemistry of Enzyme Catalyzed Reactions (4)

A discussion of the chemistry of representative enzyme catalyzed reactions is presented. Enzyme reaction mechanisms and coenzyme chemistry are emphasized. *Prerequisite:* organic chemistry. (W)

### 218. Biochemistry II (4)

A comprehensive course in biochemistry emphasizing structural biochemistry. *Prerequisites:* physical and organic chemistry; graduate-student standing. (F)

### 219A-B-C. Special Topics in Biochemistry (4-4-4)

This special topics course is designed for first-year graduate students in biochemistry. Topics presented in recent years have included protein processing, the chemical modification of proteins, the biosynthesis and function of glycoproteins, lipid biochemistry and membrane structure, and bioenergetics. *Prerequisites:* undergraduate courses in biochemistry.

### 220. Advanced Inorganic Chemistry (4)

Introduction to theoretical inorganic chemistry. Chemistry of typical main group and transition elements; coordination compounds; organometallic chemistry, catalysis, experimental techniques. *Prerequisites:* Chem. 120B, 141C, and 131.

### 221. Energy Transduction (4)

A discussion of the mechanisms for the generation and utilization of ATP in biological systems will be discussed. Specific topics will include oxidative phosphorylation, photophosphorylation, active transport muscle contraction, bioluminescence, and chemiluminescence. *Prerequisites:* organic chemistry and introductory biochemistry.

### 222. Biochemical Evolution (4)

The course emphasizes the chemical aspects of evolution, including the origin of living systems on earth, primitive energy acquisition devices, the coupling of information storage and replication catalysis, protein evolution, and the biochemical unity and diversity of extant organisms. *Prerequisites:* organic chemistry and introductory biochemistry. (W)

### 223. Organometallic Chemistry (4)

A survey of this field from a synthetic and mechanistic viewpoint. Reactivity patterns for both main group and transition element organometallic compounds will be discussed and organized to periodic trends.

### 224. Spectroscopic Techniques (4)

Application of physical techniques to the elucidation of the structure of inorganic complex ions and organometallic compounds. Topics covered include group theory, and its application to vibrational, magnetic resonance and Raman spectroscopy.

### 226. Mechanistic Aspects of Catalytic Reactions (4)

Mechanisms of substitution and electron transfer reaction of inorganic complexes will be examined from an experimental point of view. A quantitative treatment of rate laws, the steady state approximation and multistep mechanisms of reactions that are catalyzed by soluble transition metal complexes.

### 227. Seminar in Inorganic Chemistry (2)

Seminars presented by faculty and students on topics of current interest in inorganic chemistry, including areas such as bioinorganic, organometallic and physical-inorganic chemistry. The course is designed to promote a critical evaluation of

the available data in specialized areas of inorganic chemistry. Each quarter three or four different topics will be discussed. *Prerequisite: graduate standing or consent of instructor.*

## 229. Special Topics in Inorganic Chemistry (2-4)

### 235. Spectroscopy and Structure (4)

The interaction of electromagnetic radiation with molecules and bulk matter: x-ray and optical scattering; electronic, vibrational, and rotational spectroscopy; nuclear and electron magnetic resonance. Emphasis will be placed on the interpretation of experimental data.

### 236. Atherosclerosis (2)

This multidisciplinary course integrates the studies of the pathogenesis of atherosclerosis, with emphasis on lipoprotein metabolism, and the cellular and biochemical mechanisms of lesion development. Topics will include: A review of basic lipid and lipoprotein metabolism; phospholipid metabolism and the prostaglandins; the relationship of coronary heart disease to genetic hyperlipoproteinemia, and possible therapeutic approaches to atherosclerosis. Two-hour lectures. Same as Medicine 236. *Prerequisite: biochemistry.* (S)

### 242. Natural Products Chemistry (4)

An outline of the chemistry of terpenes, steroids, alkaloids, and plant phenols developed on the basis of modern biogenetic theory. Special emphasis will be given to biologically active substances such as hormones and antibiotics. *Prerequisites: Chem. 140A-B-C or 141A-B-C.*

### 244. Synthesis of Complex Molecules (4)

In order to plan the most economic synthesis of an organic molecule, one must consider many possible routes. The arguments used to weigh one route against another will be discussed in detail. The uses of specific reagents and protecting groups will be outlined. The control of stereochemistry during a synthesis will be emphasized. Examples will be selected from the recent literature. *Prerequisite: Chem. 148 or 248.*

### 245. Structure and Properties of Organic Molecules (4)

Introduction to the measurement and theoretical correlation of the physical properties of organic molecules. Topics to be covered include molecular orbital theory, bond lengths, bond energies, dipole moments, ionization potentials, infrared and ultraviolet spectra, nuclear magnetic resonance, and electron spin resonance.

### 246. Kinetics and Mechanism (4)

Methodology of mechanistic organic chemistry: integration of rate expressions, determination of rate constants, transition state theory; catalysis, kinetic orders, isotope effects, substitute effects, solvent effects, linear free energy relationship; product studies, stereochemistry; reactive intermediates; rapid reactions.

### 247. Mechanisms of Organic Reactions (4)

A qualitative approach to the mechanism of various organic reactions; substitutions, additions, eliminations, condensations, rearrangements, oxidations, reductions, free-radical reactions, and photochemistry. Includes considerations of molecular structure and reactivity, synthetic methods, spectroscopic tools, and stereochemistry. The topics emphasized will vary from year to year. This is the first quarter of the graduate organic chemistry sequence. *Prerequisite: Chem. 141C.*

### 248. Synthetic Methods in Organic Chemistry (4)

A survey of reactions of particular utility in the organic laboratory. Emphasis is on methods of preparation of carbon-carbon bonds and oxidation-reduction sequences. *Prerequisite: Chem. 141C or consent of instructor.*

## 249. Special Topics in Organic Chemistry (2-4)

### 250. Seminar in Chemistry (2)

Regularly scheduled seminars by first-year graduate students provide opportunities for practice in seminar delivery and for the exploration of topics of general interest. (S/U grades only.) (S)

### 251. Research Conference (2)

Group discussion of research activities and progress of the group members. *Prerequisite: consent of instructor* (S/U grades only.) (F,W,S)

### 253. Current Topics in Chemistry (2)

This course is designed to present recent publications in ar-

reas of chemistry which are related to the field in which graduate students are doing thesis work. Original papers are presented by both faculty and students, followed by discussion of the material presented. *Prerequisite: consent of instructor.* (S/U grades only.) (F,W,S)

### 267. Biochemistry of Lipid and Lipoprotein Diseases (2)

This course will cover the metabolism of lipids and lipoproteins from the basic biochemistry to human disease implications. The aim of the course will be to first develop a broad understanding of the basic biochemical aspects of lipid metabolism including structural aspects of lipids and lipoproteins and mechanistic aspects of the enzymes that act upon them. Then the regulation of lipid metabolism and the implications for disease states will be considered. Finally, the application of these ideas to the treatment of specific human diseases will be discussed. (S)

### 272. Nuclear and Cosmochemistry (4)

Introduction to cosmochemistry with emphasis on nuclear aspects. Structure and properties of nuclei. Nuclear reactions. Radioactive decay processes. Abundance and synthesis of the elements. Chronology of events in the early solar system. Origin and early history of the solar system. Effects of cosmic-ray bombardment. *Prerequisite: consent of instructor.*

### 293. Cosmochemistry Seminar (2)

Formal seminars or informal sessions on topics of current interest in cosmochemistry as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

### 294. Organic Chemistry Seminar (2)

Formal seminars or informal puzzle sessions on topics of current interest in organic chemistry, as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

### 295. Biochemistry Seminar (2)

Formal seminars or informal puzzle sessions on topics of current interest in biochemistry, as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

### 296. Chemical Physics Seminar (2)

Formal seminars or informal sessions on topics of current interest in chemical physics as presented by visiting lecturers, local researchers, or students. *Prerequisite: advanced graduate-student standing.* (S/U grades only.) (F,W,S)

### 298. Special Study in Chemistry (1-4)

Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. (S/U grades only.) Credit is limited to four units per quarter. (F,W,S)

### 299. Research in Chemistry (1-12)

*Prerequisites: graduate standing and consent of instructor.* (S/U grades only.) (F,W,S)

### 500. Teaching in Chemistry (4)

A doctoral student in chemistry is required to assist in teaching undergraduate chemistry courses. One meeting per week with instructor, one or more meetings per week with assigned class sections or laboratories, and attendance at the lecture of the undergraduate course in which he or she is participating. *Prerequisites: graduate standing and consent of instructor.* (S/U grades only.) (F,W,S)

## CHICANO STUDIES

OFFICE: 121 Third College  
Humanities Building

### Faculty:

Carlos Blanco, Ph.D. (*Professor of Literature and Third World Studies*)  
Claudio Fenner-Lopez, M.F.A. (*Lecturer in Communication with Security of Employment*)

Ramon Gutierrez, Ph.D. (*Assistant Professor of History*)

Jorge Huerta, Ph.D. (*Associate Professor of Drama*)

David Mares, Ph.D. (*Assistant Professor of Political Science*)

George Mariscal, Ph.D., (*Assistant Professor of Literature*)

Michael P. Monteon, Ph.D. (*Associate Professor of History*)

Ramon Ruiz, Ph.D. (*Professor of History*)

Marta Sanchez, Ph.D. (*Associate Professor of Literature and Third World Studies*)

Rosaura Sanchez, Ph.D. (*Associate Professor of Literature and Third World Studies*)

Faustina Solis, M.S.W. (*Professor of Urban Studies; Community and Family Medicine/Third College Provost*)

## The Major

The Chicano studies major is a joint major. As such, it has a disciplinary emphasis, i.e., it is worked out jointly with a UCSD department. The disciplinary emphasis will be the foundation for systematic study of the Chicano experience. Knowledge of the total context of the Chicano experience will also be developed through study in other disciplines and study of the Spanish language. Students may enter the program with a basic knowledge of Spanish (as obtained, for instance, in the language program), but a fluent knowledge of Spanish will be expected of all majors.

Majors will be advised by the Chicano studies staff and departmental staff.

At present it is possible to receive the following degrees in Chicano studies at UCSD:

B.A. degree in history and Chicano studies

B.A. degree in Chicano studies with a literature emphasis

## History/Chicano Studies Major

Two sets of requirements are necessary:

### 1. History requirements

Three lower-division courses:

7A-7B-7C Sequence in Race & Ethnicity

Twelve upper-division history courses:

seven in field of concentration (Western-Hemisphere)

three in different field (i.e., Europe, Non-Western)

two in remaining field (i.e., Europe, Non-Western)

## CHICANO STUDIES

- Chicano studies requirements  
Spanish fluency  
Three upper-division courses in history (as part of twelve courses required by Department of History)  
Three upper-division Chicano studies courses outside of history

### Literature/Chicano Studies Major

Two sets of requirements are necessary:

- Literature requirements  
Lower-division courses:  
These will vary depending on the program of concentration.  
Twelve upper-division literature courses:  
These will vary depending on program of concentration.
- Chicano studies requirements  
Spanish fluency  
Three upper-division Chicano studies courses in literature (as part of twelve courses required by Department of Literature)  
Three upper-division Chicano studies courses outside of literature

A limited number of independent studies, based on consultation with a faculty member or program adviser, are applicable toward the majors.

### The Minor

The Chicano Studies Program has a minor program, which is interdisciplinary and provides students with a breadth of understanding of Chicano issues.

Students will be able to satisfy their minor by taking six courses. At least three of the courses must be upper-division. The following courses are applicable toward the minor.

#### Lower-Division Courses

- Theatre-Chicano Studies 15: Introduction to Chicano Theatre  
Literature-Spanish 25: Composition and Conversation  
Literature-Spanish 10: Readings and Interpretations  
History-Chicano Studies 7C: Race and Ethnicity in the U.S.

#### Upper-Division Courses

- Literature-Chicano Studies 132: La Chicana  
Theatre-Chicano Studies 142: Chicano Dramatic Literature  
Literature-Chicano Studies 162/143: Spanish Language in the U.S.  
Lit/Sp-Chicano Studies 150: Development of Chicano Literature  
Lit/Sp 151: Themes and Motifs in Chicano Literature

- Lit/Sp-Chicano Studies 152: Chicano Prose  
Lit/Sp-Chicano Studies 153: Chicano Poetry  
Lit/Sp 154: Chicano Theatre  
History-Chicano Studies 155A: Social Economic History of Southwest  
History-Chicano Studies 155B: Social Economic History of Southwest  
History-Chicano Studies 155Q: Colloquium on Mexican-American History  
Theatre-Chicano Studies 187A/137A: Ensemble: Chicano Teatro  
Theatre-Chicano Studies 187B/137B: Ensemble: Chicano Teatro

### Courses

**7C. Race and Ethnicity in the United States (4)**  
(Same as TWS/History 7C.) A lecture-discussion course on the comparative ethnic history of the U.S. Of central concern will be the Mexican-American race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America.

**15. Introduction to Contemporary Chicano Theatre (4)**  
(Same as Theatre 15.) A study of the history and growth of Chicano theatre, focusing on contemporary Chicano teatro and playwrights.

**105. Urban Studies in International Perspective: The U.S.-Mexico Border Region**  
(Same as Urban Studies 105.) Course analyzes urban and regional development theory in the context of the U.S.-Mexico international border area. Explores concepts of urban systems, regional inequality, planning, economic base, transportation, land use, local politics and twin cities. Department stamp required. *Prerequisite: upper-division standing or consent of instructor.*

**132. La Chicana (4)**  
(Same as Third World Studies 137.) A clinical perspective of the Chicana's present minority status through an exploration of relevant crucial issues (i.e., employment, education, health, family). *Prerequisite: upper-division standing.*

**137A. Ensemble: \_\_\_\_\_ (4)**  
(Same as Theatre 187A.) An intensive theatre practicum designed to generate theatre created by an ensemble with particular emphasis upon the analysis of text. Students will explore and analyze the script and its author. Ensemble segments include: black theatre, Chicano theatre, feminist theatre, commedia d'ell arte theatre. *Prerequisites: Department of Theatre stamp required. Audition may be required. (Course pertaining directly to Chicano studies applicable only.)*

**137B. Ensemble: \_\_\_\_\_ (4)**  
(Same as Theatre 187B.) An intensive theatre practicum designed to generate theatre created by an ensemble, with particular emphasis upon explorations of ensemble, rehearsal process, the development of technical self-support systems, the extension of performance modes, and performer-event-audience relationships. Ensemble segments include: black theatre, Chicano theatre, feminist theatre, commedia d'ell arte theatre. *Department of Theatre stamp required. Audition may be required. Prerequisite: Chicano studies 137A/Theatre 187A. (Course pertaining directly to Chicano studies applicable only.)*

**142. Chicano Dramatic Literature (4)**  
(Same as Theatre 142.) Focusing on the contemporary evolution of Chicano dramatic literature, this course will analyze the playwrights and theatre groups that express the Chicano experience in the United States. Relevant "actos," plays and documentaries will be examined for their contributions to the developing Chicano theatre movement. *Prerequisites: upper-division standing and consent of instructor. Chicano Studies 15 or Theatre 15 recommended.*

**150. Development of Chicano Literature (4)**  
(Same as Lit/Sp 150 and TWS 150.) A cross-genre survey of

the major works in Chicano literature from its beginning to the present, with primary emphasis on contemporary works. *Prerequisite: upper-division standing or consent of instructor.*

**152. Chicano Prose (4)**  
(Same as Lit/Sp 154 and TWS 154.) A study of the different genres of Chicano prose: essay, novel, short story, autobiography. Attention is given to the development of Chicano prose styles and the historical and cultural movement in which these forms develop.

**153. Introduction to Chicano Literature (4)**  
This course introduces students to the particular life experience of the Chicano and the unique expression given that experience by Chicano authors, whether in novels, short stories, poetry, or dramatics works. *Prerequisite: speaking and reading knowledge of Spanish or consent of instructor.*

**154. Chicano Poetry (4)**  
(Same as Lit/Sp 153 and TWS 155.) The analysis and discussion of the major forms and modes of Chicano poetry, with primary emphasis on the developing styles of the poets and on the study of the texts' and the authors' historical moment. *Prerequisite: upper-division standing or consent of instructor.*

**155A. Social and Economic History of the Southwest (4)**  
(Same as History 155A.) An introduction to American borderland history with special emphasis on historiography, economic and social developments of the border states during the eighteenth and nineteenth centuries. The course is designed to present various interpretations of American southwestern history.

**155B. Social and Economic History of the Southwest (4)**  
(Same as History 155B.) The course will consider the significant trends in Mexican-American history over the past one hundred years in the Southwest. Special emphasis will be placed upon primary documents relating to Mexican-Americans in economic and social institutions.

**155Q. Colloquium in Mexican-American History (4)**  
(Same as History 155Q.) This course will examine the historical literature concerned with the Mexican-American people in the United States. Specific topics of discussion will include immigration, urbanization, and assimilation of this population from the mid-nineteenth century to the present. *Prerequisite: upper-division standing or consent of instructor.*

**198. Directed Group Study (4)**  
Directed group study on a topic or in a field not included in the regular academic curriculum, by special arrangement with a faculty member. (PINP grades only.) *Prerequisites: upper-division standing and consent of instructor. (F,W,S)*

**199. Independent Study (4)**  
Tutorial: individual guided reading and research projects (to be arranged between student and instructor) in an area not normally covered in courses currently being offered in the department. (PINP grades only.) *Prerequisites: upper-division standing and consent of instructor. (F,W,S)*

Related course offerings in other departments:

### History

**146A-B. A History of Mexico (4-4)**  
The first quarter covers the period from the conquest through the Revolution of 1910. The second quarter covers the period since 1910. Ruiz

### Literature

**Lit/Sp 135. Mexican Literature (4)**  
Study of popular novels, movements, traditions, key authors, or major trends in modern Mexican literature.

**Lit/Sp 166. Creative Writing (4)**  
A workshop designed to foster and encourage writing in Spanish of students working on short forms of fiction.

Students wishing to include additional related courses from these or other departments should consult a Chicano studies adviser.



## CHINESE STUDIES

OFFICE: 3084 Humanities and Social Sciences Building, Muir College

### Professors:

Joseph C.Y. Chen, Ph.D. (*Physics*)  
 Matthew Y. Chen, Ph.D. (*Linguistics*)  
 David K. Jordan, Ph.D. (*Anthropology*)  
 Richard P. Madsen, Ph.D. (*Sociology*)  
 (Chairman)  
 Thomas A. Metzger, Ph.D. (*History*)  
 Wai-Lim Yip, Ph.D. (*Literature*)

### Associate Professors:

Paul G. Pickowicz, Ph.D. (*History*)  
 Susan L. Shirk, Ph.D. (*Political Science*)  
 William S. Tay, Ph.D. (*Literature*)

### Lecturer:

Ping C. Hu, M.A. (*Chinese*)

Chinese studies is an interdisciplinary program that allows the student interested in China to utilize the university's offerings in various departments to build a major leading to a B.A. degree. In addition to coordinating courses in the various departments, the Program in Chinese Studies offers courses directly under its own auspices to round out the available offerings.

Many of the participating faculty in the program have a converging interest in contemporary China. For this reason, this is one of the strongest programs on modern Chinese society now available. Another focal point of research interest is the intellectual history and the evolution of scientific ideas and technology in pre-modern China. The interdisciplinary nature of the program (see departmental affiliation of the participating faculty) can accommodate students of a wide range of interests. In addition to our local resources, the University of California Education Abroad Program (EAP) has a study center in Beijing and is affiliated with the International Asian Studies Program at the Chinese University of Hong Kong and with the California State Universities, International Studies Program in Taiwan. This provides the possibility of a junior year abroad, including both language courses and courses dealing with various aspects of Chinese studies. EAP credits may be transferred back to UCSD to coordinate with on-campus offerings.

UCSD has also arranged formal academic exchange programs with Chongqing University (Chongqing), Huazhong Institute of Technology (Wuhan), Fudan University (Shanghai), and Jiaotong University (Shanghai) in the People's Republic of China.

## The Major Program

The student choosing a major in Chinese studies must meet the following requirements:

1. Two years of Mandarin Chinese (Chinese Studies 11, 12, 13 and 21, 22, 23 or equivalent.)
2. Twelve upper-division courses in Chinese Studies, including courses taken in at least three departments. At least one of these courses should be a seminar, in which students would be expected to write a substantial term paper.

In principle, the courses included in the Program in Chinese Studies are those campus offerings dealing with China or the Chinese language. Most of the courses listed below are planned by participating departments for the 1987-88 academic year.

## Honors Program

Requirements for admission to the program are:

1. Junior standing;
2. a GPA of 3.5 or better in the major;
3. overall GPA of 3.2 or better;
4. recommendation of a faculty sponsor familiar with the student's work;
5. completion of at least four upper-division courses approved by the Program in Chinese Studies;
6. completion of at least one year of Chinese language study.

Students who qualify for honors take a two-quarter sequence of directed study in the course of which they define a research project, carry out the research, and complete a senior thesis.

The completed thesis will be evaluated by a committee consisting of the student's thesis adviser and one other faculty member appointed by the Chinese Studies program coordinator.

## The Minor Program

A minor in Chinese studies consists of six courses (no more than three lower-division) approved by a college. Three Chinese language courses may apply as lower-division. At least three courses have to be in a discipline *other* than language study. A list of approved offerings is available quarterly in the Program in Chinese Studies office.

## Courses

### Committee-Sponsored Courses

11-12-13. First Year Chinese (4-4-4)

21-22-23. Second Year Chinese (4-4-4)

111-112-113. Third Year Chinese (4-4-4)

121-122-123. Fourth Year Chinese (4-4-4)

### 150. Intensive Summer Language Cultural Program in China (8)

Intensive language and cultural study at one or more sister institutions in China. Program includes regularly scheduled language classes taught by UCSD staff members, a cultural program of films, stage performances and lectures, and field trips to village, urban industrial communities, and places of historical interest. The entire program will be conducted in Chinese. *Prerequisites: Chinese Studies 13 or equivalent and consent of instructor.* (Summer)

### 163. Introduction to Chinese Linguistics (4)

This course will be an introduction to linguistics for students of the Chinese language. It will cover phonological and grammatical structures, dialectology, and a brief survey of the history of the language.

### 170. History of Science in China (4)

This course is designed to provide a coherent picture of aspects of the development of science in Chinese civilization from ancient times through the eighteenth century. The focus (mathematics, astronomy, medicine, chemistry, etc.) will shift from year to year.

### 181A. Introduction to Classical Chinese (4)

Introduction to the classical language through Confucius, Mencius, and the other Great Books. The emphasis will be on comprehension and reading ability. *Prerequisite: Chinese Studies 23 or equivalent.*

### 181B. Introduction to Classical Chinese (4)

Continuation of Chinese Studies 181A. *Prerequisite: Chinese Studies 181A or equivalent.*

### 183. Readings in Classical Chinese (4)

Introduction to major works written in classical Chinese, including poetry and historical documents. *Prerequisite: Chinese Studies 181B or equivalent.*

### 196. Directed Thesis Research (4)

Bachelor's thesis; under the direction of a faculty member in Chinese studies. *Prerequisite: consent of instructor.* (F,W,S)

### 198. Directed Group Study in Chinese Studies (2 or 4)

Study of specific aspects in Chinese civilization not covered in regular course work, under the direction of faculty members in Chinese studies. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

### 199. Independent Study in Chinese Studies (2 or 4)

The student will undertake a program of research or advanced reading in selected areas in Chinese studies under the supervision of a faculty member of the Program in Chinese Studies. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

### 500. Apprentice Teaching (1-4)

A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty; handling of discussions, preparation and grading of exams and other written exercises, and student relations.

## Upper-Division Chinese Studies Courses

For description of courses listed below, see appropriate departmental listing.

### I. CONTEMPORARY CHINESE SOCIETY

Anthropology 103: Chinese Popular Religion (Jordan)

## CLASSICAL STUDIES

- Anthropology 109: Chinese Familism (Jordan)  
History 184: History of the People's Republic of China (Pickowicz)  
Political Science 130CA-CB: Comparative Communism (Shirk)  
Political Science 130B: Politics in the People's Republic of China (Shirk)  
Political Science 130D: Seminar — Chinese Politics (Shirk)  
Sociology 188B: Chinese Society (Madsen)

## II. LANGUAGE, THOUGHT, AND SOCIETY

- Chinese Studies 111-112-113: Third Year Chinese (Hu)  
Chinese Studies 121-122-123: Fourth Year Chinese (Hu)  
Chinese Studies 150: Intensive Summer Language and Cultural Program in China (Staff)  
Chinese Studies 163: Introduction to Chinese Linguistics (M. Chen)  
Chinese Studies 181A, 181B: Introduction to Classical Chinese (Staff)  
History 183Q: Cinema and Society in Twentieth Century China (Pickowicz)  
History 186Q: Self and Society in Modern Chinese Thought (Metzger)  
History 189Q: Literature and Society in Republican China (Pickowicz)  
Linguistics 141: Language Structures (M. Chen)  
Literature/Chinese 101: Readings in Contemporary Chinese Literature (Yip)  
Literature/Chinese 120: Readings in Classical Chinese Poetry (Tay)  
Literature/General 150: Chinese Literature in Translation (Yip)  
Literature/General 150: Classical Chinese Fiction (Tay)  
Literature/General 150: Modern Chinese Fiction (Tay)  
Literature/General 150: Communist Chinese Fiction (Tay)  
Literature/Comp 271: Critical Theory: Chinese Poetics (Yip)  
Literature/Comp 272: Literary/Social History: Marxist Literary Criticism in Modern China (Tay)  
Literature/Comp 274: Genre Studies: Landscape Poetry: Chinese and American (Yip)

## III. MODERN CHINESE HISTORY

- History 182: History of the Modern Chinese Revolution: 1800-1911 (Pickowicz)

- History 183: History of the Modern Chinese Revolution: 1911-1949 (Pickowicz)  
History 184: History of the People's Republic of China (Pickowicz)  
History 185Q: The Chinese Village in Transition: 1930-1956 (Pickowicz)  
History 187Q: Political Development and Political Thought in Taiwan Since 1945 (Metzger)

## IV. PREMODERN CHINESE HISTORY

- Chinese Studies 170: History of Science in China (J. Chen)  
History 181A: The History of Chinese Thought and Society: The Ancient Imperial Period (Metzger)  
History 181B: The History of Chinese Thought and Society: The Middle Imperial Period (Metzger)  
History 181C: The History of Chinese Thought and Society: The Late Imperial Period (Metzger)

## CLASSICAL STUDIES

OFFICE: 3070 Humanities and Social Sciences Building, Muir College (CAESAR office)

### Professors:

- Page Ann duBois, Ph.D. (*Classical and Comparative Literature*)  
Edward N. Lee, Ph.D. (*Philosophy*)  
Alden A. Mosshammer, Ph.D. (*History*)

### Associate Professors:

- Georgios H. Anagnostopoulos, Ph.D. (*Philosophy*)  
David K. Crowne, Ph.D. (*English, Comparative Literature*)  
William Fitzgerald, Ph.D. (*Classical and Comparative Literature*) (*Chairman*)  
Richard E. Friedman, Ph.D. (*Hebrew and Comparative Literature*)  
Sheldon Nodelman, Ph.D. (*Visual Arts*)

### Lecturers:

- Julie Hemker, Ph.D. (*Classical Language and Literature*)  
Eliot Wirshbo, Ph.D. (*Classical Language and Literature*)

This program offers undergraduates an opportunity to study the cultures of Greece, Rome, and the ancient Near East through the coordinated resources of the Departments of History, Literature, Visual Arts, and Philosophy. Besides training in Greek, Latin, and Hebrew, courses are included in the history, literature, art, and

philosophy of Greece, Rome, and the ancient Near East, using materials in the original languages and in translation.

## The Major Program

A major in classical studies consists of a choice of twelve upper-division courses approved for the program and listed below. Six of the twelve courses must involve some use of materials in the original language, Greek, Latin, or Hebrew. The particular courses making up each student's major will be selected with advice from the program staff. The major will normally include courses from three of the participating departments.

## The Minor Program

A minor in classical studies consists of six courses from those listed below, of which at least three must be upper-division. A knowledge of the ancient languages is not required. The minor will normally include Classical Studies 19A-B-C: the Greco-Roman World, and three other courses from the participating departments.

## Warren College

A Warren College program of concentration in classical studies normally consists of Classical Studies 19A-B-C and three of the upper-division courses listed below.

Graduate courses may be taken by undergraduates with consent of the instructor. The faculty of the program welcomes qualified undergraduates in graduate courses.

Additional courses counting toward a major in classical studies are offered on a year-to-year basis, both at the undergraduate and graduate levels. As these often cannot be listed in advance, interested students should consult the program faculty for an up-to-date list.

## Courses

### Undergraduate

#### Classical Studies 19A-B-C. Introduction to the Ancient Greeks and Romans (4-4-4)

This interdisciplinary sequence includes the literature, mythology, art, philosophy, and history of ancient Greece and Rome, a complex civilization which had a determining influence on all later Western culture.

#### Classical Studies 51. Bio-Scientific Vocabulary (Greek-Latin Roots) (4)

Intensive exposure (100 words per week) to Greek and Latin roots, prefixes, and suffixes which form the basis of bio-scientific terminology. Extensive practice in word-building and analysis. No knowledge of Greek or Latin required.

#### Cultural Traditions. Judaic 1A-B-C (4-4-4)

#### Humanities 11A-B-C. The Western Tradition (6-6-6)



Visual Arts 11. Prehistoric and Ancient Art (4)

Classical Studies 107. Myth, Religion, and Philosophy in Late Antiquity (4)

Classical Studies 111. Topics in Ancient Greek Drama (4)

Close reading and discussion of selected works of ancient Greek drama in translation. (Course may be repeated for credit when topic varies.) *Prerequisite: sophomore standing.*

History 100. The Ancient Near East and Israel (4)

History 101A-B. Greece in the Classical Age (4-4)

History 101Q. Special Topics in Greek History (4)

History 102A-B. The Roman Republic and Empire (4-4)

History 102Q. Special Topics in Roman History (4-4)

History 132A-B-C. The Rise of Christianity (4-4-4)

History 199. Independent Study in Greek and Roman History

Lit/Gk 1. Elementary Greek (4)

Lit/Gk 2. Intermediate Greek I (4)  
*Prerequisite: Lit/Gk 1 or equivalent.*

Lit/Gk 3. Intermediate Greek II (4)  
*Prerequisite: Lit/Gk 2 or equivalent.*

Hebrew 1-2-3. Beginning and Intermediate Hebrew (4-4-4)

Lit/La 1. Elementary Latin (4)

Lit/La 2. Intermediate Latin I (4)  
*Prerequisite: Lit/La 1 or equivalent.*

Lit/La 3. Intermediate Latin II (4)  
*Prerequisite: Lit/La 2 or equivalent.*

Lit/Gk 100. Introduction to Greek Literature (4)

Lit/Gk 104. Tragedy (4)

Lit/Gk 106. Comedy (4)

Lit/Gk 108. History (4)

Lit/Gk 110. Prose (4)

Lit/Gk 112. Archaic Period (4)

Lit/Gk 114. Classical Period (4)

Lit/Gk 116. Hellenistic Period (4)

Lit/Gk 119. New Testament Greek (4)

Lit/Gk 121. Epic Poetry (4)

Lit/Gk 123. Lyric Poetry (4)

Hebrew 101. Introduction to Hebrew Texts (4)

Hebrew 102. Intermediate Hebrew Texts (4)

Hebrew 103. Advanced Hebrew Texts (4)

Lit/La 100. Introduction to Latin Literature

Lit/La 106. The Novel (4)

Lit/La 108. Prose (4)

Lit/La 110. Lyric and Elegiac Poetry (4)

Lit/La 112. Epic (4)

Lit/La 114. History (4)

Lit/La 116. Pre-Augustan (4)

Lit/La 118. Augustan (4)

Lit/La 120. Silver Latin (4)

Lit/La 122. Late Latin (4)

Lit/La 124. Medieval Latin (4)

Lit/La 129. Renaissance Latin (4)

Lit/Gen 107. New Testament Literature (4)

Lit/Gen 110. Hebrew Prophetic Literature (4)

Lit/Gen 111. Bible: The Narrative Books (4)

Lit/Gen 112. Bible: The Poetic Books (4)

Lit/Gen 115. Topics in the Prophets (4)

Lit/Gen 116. Topics in Biblical Narrative (4)

Lit/Gen 117. Topics in Biblical Poetry (4)

Lit/Gen 118. Interpreting the Bible in the Twentieth Century (4)

Lit/Gen 119. Mythology (4)

Lit/Gen 120. The Classical Tradition (4)  
*(May be repeated for credit as topics vary.)*

Lit/He 110. Hebrew Prophetic Literature (4)

Lit/He 111. Bible: The Narrative Books (4)

Lit/He 112. Bible: The Poetic Books (4)

Lit/He 115. Topics in the Prophets (4)

Lit/He 116. Topics in Biblical Narrative (4)

Lit/He 117. Topics in Biblical Poetry (4)

Lit/He 118. Interpreting the Bible in the Twentieth Century (4)

Lit/He 190. Seminar in Biblical Studies (4)

Lit. 199. Special Studies in Greek and Roman Literature

Philosophy 101. History of Philosophy: Greek Philosophy (4)

Greek philosophy from the pre-Socratic philosophers through Plato.

Philosophy 102. History of Philosophy: Hellenistic and Roman Philosophy (4)

Greek philosophy from Aristotle to Plotinus including the major schools of Hellenistic philosophy: Stoicism, Epicureanism, Skepticism, and Neoplatonism.

Philosophy 108. Mythology and Philosophy (4)

Study of various ancient Near-Eastern mythologies in relation to Greek philosophy.

Philosophy 199. Independent Study (4)

Visual Arts 115M. Greek Art (4)

Visual Arts 115V. Roman Art (4)

Visual Arts 115J. Late Antique Art (4)

## Graduate

History 201. The Literature of Ancient History (4)

History 298. Directed Readings in Greek and Roman History (1-12)

Lit/Co 210. Classical Studies (4)

*Prerequisite: working knowledge of either Greek or Latin.*

Lit/Co 270. Ancient Literary Theory (4)

Lit/CI 297. Directed Studies in Greek or Latin Literature (1-12)

Lit/CI 298. Special Projects in Greek or Roman Literature (4)

Philosophy 201. Greek Philosophy (4)

Philosophy 202. Hellenistic and Roman Philosophy (4)

Philosophy 290. Directed Independent Study (1-4)

## CLINICAL PSYCHOLOGY

OFFICE: 2410C VAMC  
534-6614

### Professors:

Gary R. Birchler, Ph.D. (*Clinical/Psychiatry*)

Nelson Butters, Ph.D. (*In Residence/Psychiatry*)

J. Christian Gillin, M.D. (*Psychiatry*)

Igor Grant, M.D. (*Psychiatry*)

Philip M. Groves, Ph.D. (*Psychiatry*)

Robert K. Heaton, Ph.D. (*Psychiatry*)  
(*Program Director*)

Lewis L. Judd, M.D. (*Psychiatry*)

Daniel F. Kripke, M.D. (*In Residence/Psychiatry*)

Arnold J. Mandell, M.D. (*Psychiatry*)

Nolan E. Penn, Ph.D. (*Psychiatry*)

Laura Schreiber, Ph.D. (*Psychology*)

Marc A. Schuckit, M.D. (*In Residence/Psychiatry*)

David S. Segal, Ph.D. (*Psychiatry*)

Larry R. Squire (*In Residence/Psychiatry*)

Lowell H. Storms, Ph.D. (*In Residence/Psychiatry*)

Paula Tallal, Ph.D. (*In Residence/Psychiatry*)

### Associate Professors:

David L. Braff, M.D. (*Psychiatry*)

Eric Courchesne, Ph.D. (*In Residence/Neurosciences*)

### Assistant Professors:

Sonia Ancoli-Israel, Ph.D. (*Adjunct/Psychiatry*)

J. Hampton Atkinson, M.D. (*Adjunct/Psychiatry*)

Stefan Bracha, M.D. (*In Residence/Psychiatry*)

Sandra Brown, Ph.D. (*In Residence/Psychiatry*)

Dean Delis, Ph.D. (*In Residence/Psychiatry*)

Michael Irwin, M.D. (*In Residence/Psychiatry*)

Terry Jernigan, Ph.D. (*In Residence/Psychiatry*)

Ronald M. Ruff, Ph.D. (*In Residence/Psychiatry-Surgery*)

## The Joint Doctoral Program

The interdisciplinary partnership of the Department of Psychiatry at UCSD School of Medicine and the Department of Psychology at San Diego State Univer-

## COGNITIVE SCIENCE

sity greatly extends the range of perspectives and furnishes unusual opportunities for graduate study leading to the Ph.D. degree in clinical psychology. The Joint Doctoral Group in Clinical Psychology currently consists of faculty from the UCSD Department of Psychology, and UCSD School of Medicine Departments of Psychiatry, Community and Family Medicine, Neurosciences, and SDSU Department of Psychology and School of Public Health.

Information regarding admission is found in the current edition of the *Bulletin of the Graduate Division* of San Diego State University.

The program goal is to educate scientifically oriented researchers and professionals who will generate empirically substantiated knowledge, and the methods of applying this knowledge in the areas of behavioral medicine, neuropsychology, and measurement/evaluation. Currently under consideration is the addition of special concentrations in general experimental psychopathology and child-clinical. Therefore, applications from students with broader clinical interests are encouraged.

The scientist-professional model on which this program is based requires that students receive ongoing supervised experience, including planning, design, implementation, analysis, and communication of findings. Students are expected to be actively involved in these activities throughout their stay in the program.

The program is designed as a five-year curriculum, with a minimum residency requirement of one year at each institution. The curriculum is based on a twelve-month academic year. The program is designed to satisfy the criteria for accreditation of clinical psychology doctoral programs established by the American Psychological Association.

Specific courses currently required as part of the core at UCSD include: Clinical Psychology 295; Psychiatry 296 (independent study, lab practicum); Systems of Psychotherapy (Psychiatry 296); Psychiatry 299 (independent study project); Grand Rounds (Psychiatry 296); Neuropsychology (Psychiatry 296); School of Medicine 202E (Psychopathology).

### Courses:

#### Clinical Psychology 295A-B-C. Introduction to Research of UCSD/SDSU Faculty (2-2-2)

*Fall:* How to evaluate a psychological experiment will be covered. Students will evaluate two faculty papers per week. *Winter:* Using a research evaluation guide, students will evaluate two faculty papers per week. *Spring:* Using a research evaluation guide, students will evaluate two faculty papers per week. Students will develop and present their own proposed research projects. (S/U grades only.) *Prerequisite:* graduate student status in joint clinical psychology doctoral program or consent of instructor.

#### School of Medicine 202E. Social and Behavioral Sciences — Psychopathology (3)

This sequence will acquaint students with techniques of interviewing, concepts of mental illness and normality, basic research in causality of behavioral disorders, and approaches to treatment, all in the context of a bio-psychosocial frame of reference. Format combines a lecture followed by smaller group sessions with a faculty leader. The groups enable students to meet patients with behavioral disorders, to practice interviewing, to develop observational skills, and to discuss material presented in lectures and assigned readings. (S/U grades only.) *Prerequisite:* SOM 202A, C, D or consent of instructor.

#### Psychiatry 296. Independent Readings/Study in Psychiatry (1-12)

Survey of basic concepts in psychiatry using various sources of material including scientific papers in psychiatry and behavioral science, literature, history, and art. (S/U grades permitted.)

#### Psychiatry 299. Psychiatry Independent Study Project (1-12)

Independent Study Project (ISP). (S/U grades only.) *Prerequisite:* approved ISP proposal.

## COGNITIVE SCIENCE

OFFICE: 1533 Psychology and Linguistics Building, Muir College

### Professors:

Richard C. Atkinson, Ph.D. (*Psychology*)

Elizabeth Bates, Ph.D. (*Psychology*)

Patricia S. Churchland, B. Phil. (*Philosophy*)

Paul M. Churchland, Ph.D. (*Philosophy*)

Aaron Cicourel, Ph.D. (*Sociology*)

Michael Cole, Ph.D. (*Psychology*)

Roy G. D'Andrade, Ph.D. (*Anthropology*)

Steven A. Hillyard, Ph.D. (*Neurosciences*)

Edward S. Klima, Ph.D. (*Linguistics*)

Ronald W. Langacker, Ph.D. (*Linguistics*)

George Mandler, Ph.D. (*Psychology*)

Jean M. Mandler, Ph.D. (*Psychology*)

Hugh B. Mehan, Ph.D. (*Sociology*)

Donald A. Norman, Ph.D. (*Psychology*)

Walter Savitch, Ph.D. (*Computer Science*)

Larry R. Squire, Ph.D. (*Psychiatry*)

Stephen P. Stich, Ph.D. (*Philosophy*)

### Associate Professors:

Gerald J. Balzano, Ph.D. (*Music*)

Jeffrey L. Elman, Ph.D. (*Linguistics*)

Patricia W. Kitcher, Ph.D. (*Philosophy*)

Marta Kutas, Ph.D. (*In Residence/Neurosciences*)

Paula Tallal, Ph.D. (*Psychiatry*)

### Assistant Professors:

Richard K. Belew, Ph.D. (*Computer Science*)

Harold E. Pashler, Ph.D. (*Psychology*)

Joan Stiles-Davis, Ph.D. (*Psychology*)

\* \* \*

### Adjunct Professors:

Ursula Bellugi, Ed.D. (*Psychology*)

Francis H. C. Crick, Ph.D. (*Biology*)

### Assistant Adjunct Professor:

Helen J. Neville, Ph.D. (*Neurosciences*)

### Associated Research Staff:

Edwin L. Hutchins, Ph.D. (*Associate Research Cognitive Scientist*)

David Zipser, Ph.D. (*Research Cognitive Scientist*)

## The Program in Cognitive Science

Cognitive science is a new discipline, created from a merger of interests among those pursuing the study of cognition from a variety of points of view. The critical aspect of cognitive science is the search for an understanding of the principles by which intelligent, cognitive activities are carried out, whether by humans, machines, or social groups and institutions. The issues addressed by cognitive science include the use of knowledge in the broadest sense, from sensory inputs to complex problem solving, from individual skills to group efforts, from the human mind to machine intelligence. The eventual goal is a better understanding of the human mind, of teaching and learning, of mental abilities, and of the development of intelligence devices that can augment human capabilities in important and constructive ways.

## The Undergraduate Program

An undergraduate major in cognitive science is currently available to students through the Department of Psychology. A description of this program can be found in the undergraduate course listings for that department.

## The Graduate Program

There are four aspects to graduate study in cognitive science: (a) a *primary specialization* in one of the established disciplines of cognitive science; (b) a *secondary specialization* in a second field of study; (c) familiarity with general issues in the field and the various approaches taken to these issues by scholars in different disciplines; (d) an original dissertation project of an interdisciplinary character. The graduate degree program is interdisciplinary in nature, and the degree itself reflects this, being awarded jointly to the student for studies in the home department and cognitive science. Thus, students in linguistics or psychology will have degrees that read "Ph.D. in Linguistics and Cognitive Science" or "Ph.D. in Psychology and Cognitive Science."

**Admission to the program.** Students enter UCSD through admission to one of the affiliated departments, which then serves as their *home department*, and which specifies their primary specialization. The affiliated departments are: psychology, computer science, neurosciences, linguistics, philosophy, sociology, and anthropology. Students may apply for admission to cognitive science during the spring quarter of the first year of residence at UCSD and must have the equivalent of master's-level requirements in their home department before joining the Cognitive Science Program. At the time of admission, the student is assigned an advisory committee that reviews the student's interests and past record and, together with the student and the student's major adviser, develops a course of study and establishes the primary and secondary specializations. Students are encouraged to pursue significant research problems in cognitive science in close collaboration with individual faculty members. Direct research experience both within and outside of the home department is encouraged.

**Primary specialization.** Primary specialization is accomplished through the home department. Students are expected to maintain good standing within their home departments and to complete all requirements of their home departments through qualification for candidacy for the Ph.D. degree.

**Secondary specialization.** The power of an interdisciplinary graduate training program lies in large measure in its ability to provide the student the tools of inquiry of more than one discipline. Students in cognitive science are expected to gain significant expertise in areas of study outside of those covered by their home department. Such expertise can be defined in several ways. The second area might coincide with that of an established discipline, and study within that discipline would be appropriate. Alternatively, the area could be based upon a substantive issue of cognitive science that spans several of the existing disciplines, and study within several departments would be involved. In either case, students work with their advisory committee to develop an individual program of study designed to give them this secondary specialization. This requirement takes the equivalent of a full year of study possibly spread out over several years. Often it is valuable to perform an individual research project sponsored by a faculty member in a depart-

ment other than the student's home department.

The following list demonstrates some ways to fulfill the secondary specialization requirement. It should be emphasized that these programs are only examples. Students will devise individual plans by working with their advisory committees. Ideally, students who elect to do research in their area of secondary interest will be able to accomplish a substantive piece of work, either of publishable quality or one that will be of significant assistance in their dissertation project.

**Cognitive Psychology.** Get a basic introduction to cognitive psychology through the Cognitive Psychology Seminar (218A, 218B, and 218C) and acquire or demonstrate knowledge of statistical tools and experimental design (this can be done either by taking the graduate sequence in statistics, Psychology 201A and 201B, or through the standard "testing out" option offered to all psychology graduate students). Finally, and, perhaps of most importance, the student might do a year-long project of empirical research in psychology with the guidance of a member of the Department of Psychology.

**Cognitive Social Sciences.** A course sequence from sociology and anthropology, including one or two courses in field methods, and a research project under the direction of a cognitive social sciences faculty member. The course sequence and project should be worked out with the advisory committee to reflect the interests and background of the student. Examples of courses include Anthropology 214 (Quantitative Methods in Anthropology), 218 (Cognitive Anthropology), Psychology 216 (Seminar in Comparative Cognitive Research), Sociology 206 (Sociolinguistics), 244 (Sociolinguistic and Micro-Sociological Methods), 260 (Ethnomethodology), and 262 A,B,C (Cognitive and Linguistic Aspects of Social Structure). In addition, courses on field methods are offered by both anthropology and sociology.

**Computer Science and Artificial Language.** This specialization requires a thorough background in computer science. For those who enter the program without much formal training in this area, the secondary specialization in computer science includes some upper-division, undergraduate courses

(CSE 161A-B-C, 173, 178) and a minimum of two graduate courses (CSE 265A and 278). (Note that these courses require basic knowledge of programming and discrete mathematics which may require some additional undergraduate courses for those who lack these skills.) Students with stronger backgrounds in computer science may go straight to graduate courses. For all students interested in this specialization, the course sequences and any projects should be worked out on an individual basis with the students' advisory committees.

**Discourse Structure and Processing.**

This specialization is highly interdisciplinary, spanning linguistics, computer science, psychology, sociology, philosophy, and anthropology. Research within this specialization depends upon which discipline is given emphasis. Therefore, the specialization will have to be developed according to the interests of the student. All students will have to demonstrate awareness and knowledge of relevant studies and the approaches of the various disciplines. Possible courses in this specialization include CSE 161, 173, 178, and 278, Anthropology 172, Linguistics 221A and 235, Philosophy 235, Sociology 206 and 207, and Psychology 243.

**Linguistics.** The students will take the two-quarter sequence in syntax (Linguistics 221A,B), one course in phonology (Linguistics 211A), and one additional course in either syntax or semantics. Alternatively, they might take three courses in phonetics/phonology (Linguistics 210, 211A,B) plus one course in syntax (Linguistics 221A). In addition, they will prepare a research paper (preferably originating in one of the above courses) that demonstrates control of the methodology and knowledge of important issues in the field.

**Neurosciences.** A student specializing in neurosciences would take a program of courses emphasizing brain-behavior relationships, including Behavioral Neuroscience (NS 264), Neuropsychology: Brain & Behavior (NS 271), and Physiological Basis of Human Information Processing (NS 243). In addition, depending upon the student's individual interests, one or more of the neurosciences core courses would be taken in the areas of Neurophysiology (NS 262), Mammalian Neuroanatomy (NS 256), Development of the Nervous System (NS 260), Neuropharmacology (NS

## COGNITIVE SCIENCE

265), Neurochemistry (NS 234), and/or Basic Medical/Neurology (SM 205). In most cases, the student would also take a research rotation in the laboratory of a member of the neurosciences faculty.

**Philosophy.** Students who elect their secondary specialization in philosophy will focus on philosophy of science, philosophy of mind, philosophy of neuroscience or philosophy of language, depending on their area of primary specialization. Courses suitable for this program include: 212 Philosophy of Science, 235 Philosophy of Language, 270 Contemporary Epistemology and Metaphysics, 272 Theory of Knowledge, 274 Philosophy of Mind, and 285 Seminar on Special Topics, which will frequently focus on issues relevant to cognitive science. The course sequence should be worked out with the student's adviser.

**Acquisition of Perspective on the Field.** The cognitive science faculty offers a special seminar, Cognitive Science 200, that emphasizes the interdisciplinary approach to the field and that covers a variety of different problems, each from the perspective of several disciplines. All students are encouraged to attend this seminar while in residence.

**Interdisciplinary Dissertation.** It is expected that the dissertation will draw on both the primary and secondary areas of expertise, combining methodologies and viewpoints from two or more perspectives, and that the dissertation will make a substantive contribution to the field of cognitive science.

### Prequalifying Examinations

Students must complete any prequalifying and field requirements of their home department.

### Qualifying Examinations

**The dissertation advisory committee.** As soon as possible, students will form a dissertation advisory committee consisting of:

At least three members from the student's home department, including the student's adviser;

At least three members of the Cognitive Science Program, at least two of whom are not members of the student's home department.

The committee must be approved by the cognitive science faculty and by the dean of Graduate Studies. University regulations require that at least one of the faculty

members of the committee from outside the home department be tenured. This committee replaces the advisory committee that was established at the time of admission to the program. The dissertation committee is expected to play an active role in supervising the student and to meet with the student at regular intervals to review progress and plans.

In the qualifying examination, the student must demonstrate familiarity with the approaches and findings from several disciplines relevant to the proposed dissertation research and must satisfy the committee of the quality, soundness, originality, and interdisciplinary character of the proposed research. This examination will normally involve a two-part oral examination. The two parts can be scheduled independently.

### Overview

The program can be summarized in this way:

In the first years, basic training within the major discipline of the student, provided by the individual departments;

In the middle years, acquisition of secondary specialization and participation in the Cognitive Science Seminar;

In the final years, dissertation research on a topic in cognitive science, supervised by faculty from the program.

**Normal time to degree.** Because the requirements of the program go beyond those of a single individual department, students will need longer than usual to complete the Ph.D. degree. Normative time to the degree is therefore set at six years.

### Courses

The Cognitive Science Program makes use of the course offerings of various departments in the university. In addition, the program offers three quarters of the Cognitive Science Seminar each year. Students are encouraged to attend this seminar while in residence.

#### **Cognitive Science 200. Cognitive Science Seminar (4)**

A seminar offered by the program faculty emphasizing the conceptual bases of cognitive science, including problems of representation, processing mechanisms, language, and the role of interaction among individuals, culture, and the environment. Current developments in each field will be considered as they relate to broad issues of general interest in cognitive science. Two hours/week, lecture/seminar. May be repeated for credit.

The courses listed below are some of those offered in the university which are of special relevance to students in cognitive

science. Some subset of these courses offered outside the student's home department as well as other courses in the university can be used in partial fulfillment of the secondary specialization requirement. *Students should plan their secondary specialization work in conjunction with their advisory committee.*

#### **Anthropology 214. Quantitative Methods in Anthropology (4)**

This seminar will cover the basic statistical techniques used in the social sciences, as well as selected techniques of multidimensional analysis. Use will be made of computer-based interactive statistical programs, such as minitab.

#### **Anthropology 218. Cognitive Anthropology (4)**

This course will consider the relation between cultural behavior and cognitive processes. Selected topics from the fields of ethnoscience, semantic and grammatical analysis, decision making, and belief systems will be discussed. *Prerequisite: graduate standing in anthropology or psychology.*

#### **CSE 264A. Software Engineering (4)**

General principles in modern software engineering. Both theoretical and practical topics are covered. Theoretical topics include proofs of correctness, programming language semantics and theory of testing. Practical topics include structured programming, modularization techniques, design of languages for reliable programming and software tools. *Prerequisites: CSE 161A-B-C, 171A, or consent of instructor.*

#### **CSE 264B. Advanced Operating Systems (4)**

Software engineering principles and techniques which are specifically related to the design and implementation of operating systems. Topics include cooperating sequential processes, resource protection, recoverability, and systems programming language. *Prerequisites: CSE 171A-B or consent of instructor.*

#### **CSE 264C. Advanced Compiler Design (4)**

Advanced material in programming languages and translator systems. Topics include compilers, code optimization and debugging interpreters. *Prerequisites: CSE 161A-B-C or consent of instructor.*

#### **CSE 265A-B-C. Automata, Formal Languages, and Complexity Theory (4-4-4)**

Finite-state machines; context-free languages, pushdown automata, parsing theory; Turing and register type machines, halting problem, time and tape complexity; Blum axioms; analysis of the computational cost of specific tasks such as sorting, matrix manipulation, and polynomial evaluation. *Prerequisite: consent of instructor.*

#### **CSE 278A. Advanced Artificial Intelligence I (4)**

Issues in knowledge representation (using logic, semantic networks, production systems, and connectionist representations) will be the focus of this course. A discussion of logic programming languages (like PROLOG) and automatic theorem proving will then lead to a discussion of heuristic search.

#### **CSE 278B. Advanced Artificial Intelligence II (4)**

This course will discuss knowledge representations used to search for solutions, make deductions, plan and problem solve. The application of these techniques to "expert systems" will be discussed. Machine learning will also be a major topic of this course.

#### **Linguistics 210. Phonetics (4)**

Anatomy and physiology of the mechanisms used in speech. Acoustic phonetics. Speech perception. Additional topics such as neurolinguistics, acquisition, distinctive feature theory, phonetic explanation in phonology. Practice in transcription and production of the International Phonetic Alphabet.

#### **Linguistics 211A-B. Phonology (4-4)**

Introduction to theoretical concepts, methods of analysis, and descriptive apparatus. Current theoretical approaches and issues, illustrated by selected topics.

#### **Linguistics 215. Topics in Phonology (4)**

Selected research topics. Discussion of work in progress and/or survey of current literature.



**Linguistics 221A-B. Syntax (4-4)**

Introduction to generative syntax. Formulation and testing of grammar fragments for English and of general principles of grammar. This course concentrates on the syntactic constructions, the major hypotheses, and the argumentation techniques that have played a major role in the development of generative grammar.

**Linguistics 223A-B. Grammar and Cognition (4-4)**

Language in the context of the study of human cognition. Examination of the relation between meaning and grammatical form. The interaction of lexicon, morphology, and syntax and their contribution to the structuring and expression of conceptual content.

**Linguistics 225. Topics in Syntax (4)**

Descriptive and theoretical problems in the analysis of English and other languages. Emphasis on the theoretical consequences of alternative analyses. Since the contents of this course will change, it may be repeated for credit.

**Linguistics 230. Semantics (4)**

Theories of semantic structure. The relation of meaning to grammar, and how it is to be accommodated in an overall model of linguistic organization. The application of formal semantics to the description of natural language.

**Linguistics 235. Topics in Semantics (4)**

Advanced material in special areas of the study of meaning and its relation to formal aspects of human language. As subject matter varies, the course may be repeated for credit.

**Linguistics 260. Formal Linguistics (4)**

Theory of formal grammars, with particular emphasis on context-free grammars. Aspects of theories of automata and computation related to grammatical systems. Relationship of the hierarchies of automata and grammars.

**Linguistics 263. Computational Linguistics (4)**

Topics variable, and may include: parsing theory; computational models of grammar; software tools for language analysis; UNIX operating system; SNOBOL4 and Lisp programming languages. May be repeated for credit when topics vary.

**Linguistics 265. Topics in Formal Linguistics (4)**

Advanced material in special areas of the study of formal grammars to be selected by the instructor. May be repeated for credit. *Prerequisite: Linguistics 260 or consent of instructor.*

**Linguistics 270. Psycholinguistics (4)**

The study of models of language and of language acquisition from the point of view of modern linguistics and psychology.

**Linguistics 272. Language and the Brain (4)**

Basic neuroanatomical and neuropsychologic aspects of normal and abnormal language. Cerebral lateralization of language. Aphasia and dyslexia. Animal communication.

**Neurosciences 234. Molecular and Cellular Neurochemistry (4)**

Topics include membrane and nerve function in nervous system, structure and function of receptors for neurotransmitters, role of cAMP as a second messenger in the nervous system, synthesis and processing of neuropeptides. (S/U grades only.)

**Neurosciences 243. Physiological Basis of Human Information (2)**

Psychological processes including attention, perception, and memory will be studied in connection with event-related potentials of the human brain. The interrelations among psychological and physiological events will be explored in order to arrive at unified concepts of human information processing. *Prerequisites: Neurosci. 238 or Psych. 231, and consent of instructor. (S/U grades only.)*

**Neurosciences 256. Mammalian Neuroanatomy (4)**

Lectures and laboratory presenting the basic features of the anatomy of the mammalian nervous system. This will include consideration of cellular components, development, topographic anatomy, and a detailed presentation of the organization of functional systems. *Prerequisite: graduate status or consent of instructor. (S/U grades only.)*

**Neurosciences 260. Development of the Nervous System (4)**

This course will examine development of the vertebrate nervous system, with an emphasis on basic human neuroem-

bryology. Topics will include neural tube and crest formation; histogenesis, differentiation, and synaptogenesis in nuclear and cortical structures; maturation of metabolic and neurotransmitter functions; and hormonal influences on neural development. *Prerequisite: graduate or medical student or consent of instructor. (S/U grades only.)*

**Neurosciences 264. Behavioral Neuroscience (5)**

The course is to cover different areas of behavioral biology such as ethology, behavioral biology, learning and memory, perception psychophysics. Some outside reading will be required. *Prerequisite: medical student, graduate student, or consent of instructor.*

**Neurosciences 265. Neuropharmacology and Receptor Mechanisms (3)**

(Same as Physiol./Pharm. 230.) An examination of the molecular and biochemical bases of drug and neurotransmitter action. The fall quarter course is devoted to receptor mechanisms, neuropharmacology, and drug action on excitable tissues. *Prerequisite: course in biochemistry. (S/U grades only.)*

**Neurosciences 271. Neuropsychology: Principles of Brain and Behavior (4)**

(Same as Psychology 271/Psychiatry 227.) A survey of brain-behavior relationships drawing principally from the study of man and nonhuman primates. Topics to be covered include evolution of intelligence, hemispheric relations, language, memory, perception, and motivation. Emphasis will be on student presentations and discussion. (S/U grades only.)

**Philosophy 212. Philosophy of Science (4)**

An examination of such problems as concept formation, the explanation of law, the role of logic and mathematics in the sciences.

**Philosophy 235. Philosophy of Language (4)**

(Same as Ling. 286.) Examination of some current philosophical and scientific views on the nature, use, and acquisition of natural languages. May be repeated for credit as course content may vary.

**Philosophy 270. Contemporary Epistemology and Metaphysics (4)**

A detailed examination of some fundamental issues in contemporary philosophy, especially those centering about the theories of meaning and reference.

**Philosophy 272. Theory of Knowledge (4)**

An examination and critique of representative theories of mind, reality, knowledge, and perception.

**Philosophy 274. Philosophy of Mind (4)**

Contemporary work on the relation of mind and body, subjectivity, and the problem of other minds. May be repeated for credit with change of content.

**Philosophy 285. Seminar on Special Topics (4)**

A seminar for examination of specific philosophical problems. (S/U grades permitted.)

**Psychology 201A-B. Quantitative Methods in Psychology (3-3)**

An intensive course in statistical methods and the mathematical treatment of data, with special reference to research in psychology. *Prerequisite: restricted to graduate students in psychology.*

**Psychology 215. Language Acquisition (4)**

Discussion of the acquisition of language by young children, including such topics as its stages, mechanisms, and relation to nonlinguistic development. *Prerequisite: consent of instructor.*

**Psychology 216. Basic Seminar in Comparative Cognitive Research (3)**

This seminar will review current research and theory in cognitive psychology, in order to characterize group differences in cognitive functioning. Groups chosen are assumed to be not equivalent in theoretically important ways that affect their performance on standard laboratory tasks.

**Psychology 218A-B-C. Cognitive Psychology (3-3-3)**

A three-quarter survey of basic principles and concepts of cognitive psychology. This course is intended to serve as the basic introduction for first-year students. Basic areas include knowledge, memory, thought, perception, and performance.

The areas are taught by those faculty members who work within the specialty. *Prerequisite: graduate status in psychology or consent of instructor.*

**Psychology 227. Cognitive Development (4)**

Selected topics with emphasis on current experimental work. Advanced seminar. *Prerequisite: consent of instructor.*

**Psychology 228A. Theoretical Methods in Psychology (4)**

An introduction to the methodology of model building and theory development in psychology. Topics to be covered include the techniques from: stochastic modeling, computer simulations, decision theory, and scaling.

**Psychology 228B-C. Theoretical Methods in Psychology (4-4)**

Seminar on methods for building mathematical and computer simulation models in learning, memory, perception, and sensory processes.

**Sociology 205. Sociolinguistic Micro-Sociological Methods (4)**

The analysis of communication materials using sociolinguistics, psycholinguistics, and the methods of ethnoscience as well as general question-answer systems as they are related to the logic of social inquiry.

**Sociology 240. Ethnomethodology (4)**

Topics will include the philosophical origins of ethnomethodology as a social perspective; the epistemological basis of interactional approaches to social behavior in sociology and related disciplines; the role of language use in social contexts; forms of common sense reasoning in everyday life; the interpretation of normative rules; the interaction of different modes of reasoning in particular social settings.

**Sociology 241. Cognitive and Linguistic Aspects of Social Structure (4)**

Introduction to topics in speech act theory, cognitive approaches to story grammars, and the analysis of conversational or discourse material as they apply to the study of social interaction and organizational structures.

**Sociology 242. Advanced Topics in Cognitive and Linguistic Aspects of Social Structure (4)**

An advanced seminar dealing with field and quasi-experimental methods of studying discourse and textual materials. Students are expected to conduct their own field research in natural or organization settings.

COMMUNICATION

OFFICE: 127 Media Center  
Communication Building,  
Third College  
(619) 534-4411

**Professors:**

Michael Cole, Ph.D.  
Helene Keyssar, Ph.D.  
Herbert I. Schiller, Ph.D.  
Michael Schudson, Ph.D.  
James V. Wertsch, Ph.D.

**Associate Professors:**

Daniel Hallin, Ph.D.  
Chandra Mukerji, Ph.D.  
Harley Shaiken, B.A.

**Assistant Professors:**

Susan G. Davis, Ph.D.  
Robert Horwitz, Ph.D.  
Carol Padden, Ph.D.

## COMMUNICATION

### Lecturers with Security of Employment:

Claudio Fenner-Lopez, M.A.  
Dee Dee Halleck

Communication at UCSD is a field of study which emphasizes the role of different technologies of communication, from language to television, in mediating human experience. It draws from such social science disciplines as anthropology, psychology, sociology and political science, and from the humanities and fine arts, including theatre, literature, and visual arts. Communication students will develop a critical awareness of the communicative forces which affect their everyday lives as they analyze and conduct research in a variety of areas. Though the emphasis of the major is not a technical one, the faculty in the Department of Communication believes that students will develop a deeper understanding of how communication works by exploring firsthand the capabilities and limitations of a variety of media; students, therefore, will have the opportunity to conduct part of their studies in video, writing, theatre performance, or computer communication.

Within the curriculum are three broadly defined areas of study: Communication as a Social Force, Communication and Culture, and Communication and Human Information Processing. Students take courses in each of these areas.

### COMMUNICATION AS A SOCIAL FORCE

How are social systems affected by communication technology? What is the social organization of the communication industries? How is the information presented by the media related to the characteristics of the intended audiences? How do media fit into the power structure of societies? Courses in this area seek to answer such questions. Students analyze mass communications, systems of propaganda, voting campaign techniques, the development of communication technologies, and the political economy of mass communications both at home and abroad.

### COMMUNICATION AND CULTURE

Films, music, advertising, art, ritual, literature, and language are forms of communication which embody cultural beliefs of the societies from which they come. These media can influence and bring about changes in social behavior, styles, and traditions. At the same time, individ-

uals and groups can reshape the media. Students will examine the cultural forms which shape and are shaped by the ways that individuals, individuals within groups, organizations, and national groups engage in the exchange of information. Topics included are the relation between language and culture, cross-cultural communication processes and problems, and media as types of cultural expression.

### COMMUNICATION AND HUMAN INFORMATION PROCESSING

How do we turn concepts and ideas into messages? What is the process by which we receive and respond to those messages? Each medium — whether it is language, writing, or electronic media — has different properties that change the way we create and comprehend messages. The impact of television on the individual, the effect of literacy on individuals and on cultures, the ways that concepts are transmitted in film, and the means by which computers expand communication potentials are examples of topics investigated in this aspect of curriculum.

### RECOMMENDATIONS FOR TRANSFER STUDENTS

As a transfer student, you will be admitted to UCSD as a pre-communication major. Such a classification does not guarantee acceptance into the major, but is used as an indication of your interest. Acceptance into the major itself will require departmental approval based on your performance in courses that are prerequisite to the major. Some transfer courses may satisfy these requirements. Please make arrangements to see the student services coordinator in communication (619/534-2379) to determine where acceptable transfer credits can apply to the major. Bring college transcripts, college catalogues, and course syllabi at the time of your appointment. Once you have been admitted as a transfer student, please bring a copy of your "Acceptable Transfer Credits" from the Office of Admissions to the student services coordinator in communication.

### Pre-Communication

The communication major will be open only to those students who have completed the pre-communication requirements (as outlined below) with a grade of C- or better in all eight courses. (None of the pre-major courses may be taken on a Pass/No Pass basis.) Students who have completed the pre-major requirements

may apply directly to the Department of Communication to declare the major. Applications will be available through the Department of Communication office located in Media Center/Communication Building (room 127).

### REQUIREMENTS FOR THE PRE-COMMUNICATION MAJOR

Effective Fall 1987

(Lower Division: Eight courses required)

- A) Social Sciences: Two courses from the following list:
- Sociology 1A or 1B (The Study of Society)
  - Anthropology 22 (Introduction to Cultural Anthropology)
  - Anthropology 23 (Social Structure and Change)
  - Anthropology 24 (The Anthropology of Fantasy)
  - Political Science 10 (American Politics)
  - Political Science 11 (Comparative Politics)
  - Political Science 12 (International Relations)
  - Social Science 10A-B-C (Modern Society)
  - Economics 1B (Macroeconomics)
- B) Analysis and interpretation in humanities and fine arts: Two courses of your choice from the following list:
- Literature/Eng. 21, 22, 23, or 24 (The English Literary Imagination)
  - Literature/Gen. 4A,B,C (Fiction and Film in Twentieth-Century Societies)
  - VA 11-12-14 (Western Art)
  - History 1A-B-C (Latin America)
  - History 2A-B-C (United States)
  - History 3A-B-C (Europe)
  - History 7A-B-C (Race and Ethnicity in the U.S.)
  - History 24-25-26-27 (Underdevelopment, Third World)
  - History 29 (Women in the U.S.)
- C) The Study of Languages and Human Cognitive Capacities: Two courses must be chosen from the following list:
- Linguistics/General 5 (Introduction to Language)
  - Linguistics/General 10 (Introduction to General Linguistics)
  - Psychology 1 (Psychology)
  - Psychology 3 (General Psychology: Cognitive Foundations)



- Philosophy 10 (Introduction to Logic)
- Philosophy 11 (Logic and Scientific Reasoning)
- Philosophy 15 (Introduction to Philosophy: Theory and Knowledge)

## D) Communication

- Com/Gen 20 (Introduction to Communication)  
Must be taken at UCSD.

## E) Visual Arts

- Visual Arts 70 (Introduction to Media)

No upper-division courses may be taken, without instructor's permission, prior to completion of the pre-major requirements.

## The Communication Major

Degree offered: Bachelor of Arts

The communication major is not designed as a training program in advertising, journalism, production or public relations. It provides students a solid liberal arts background necessary for graduate studies in communication and other social sciences, and for professional work in a number of communication-related fields. Students in the major will master theories, concepts, and methods for researching and analyzing interactions at the societal, group, and individual levels. To gain a deeper understanding of the communicative forces that affect their everyday lives, students will have the opportunity to explore a variety of media including video, print, performance, or computer communication media. We recommend that students interested in film and video production review requirements for the media major and/or minor offered through the Department of Visual Arts. We also would like to suggest that students who wish to develop their writing abilities review the listing for the literature/writing major and/or minor offered through the Department of Literature.

As preparation for the major, students must complete the pre-communication requirements.

### Requirements for the Communication Major

The major itself consists of fourteen upper-division courses. None of the courses may be taken on a Pass/No Pass basis.

#### Upper Division: (14 Courses required)

- \*Com/SF 100: Intro. to Communication as a Social Force

\*Com/Cul 100: Intro. to Communication and Culture

\*Com/HIP 100: Intro. to Communication and Human Information Processing

\*Com/Gen 100: Intro. to Media Use in Communication

\*Com/Gen 150: Integrative Seminar in Communication to be taken in the senior year

1 media methods course (to be selected from communication courses numbered 101-120)

3 courses beyond the 100-level introductory courses: one must be chosen from *each* of the following categories — Com/SF, and Com/Cul, and Com/HIP.

5 upper-division communication electives to be selected from the communication course offerings

\*These courses must be taken at UCSD.

### Residency Requirement

Com/Gen 20, Com/SF 100, Com/Cul 100, Com/HIP 100, and CommGen 100 *must* be taken at UCSD. Students must take at least ten classes of their overall work in the major at UCSD.

### Requirements for the Communication Minor

(Effective Fall 1987)

The communication minor at UCSD is a social science minor. None of the courses may be taken on a Pass/No Pass basis. Students are required to take six courses in communication as follows:

\*Com/Gen 20 (Introduction to Communication)

Two courses of your choice from the following:

\*Com/SF 100 (Introduction to Communication as a Social Force)

\*Com/Cul 100 (Introduction to Communication and Culture)

\*Com/HIP 100 (Introduction to Communication and Human Information Processing)

Three upper-division communication electives within the areas of the chosen 100 classes.

\*These courses must be taken at UCSD

Note: Com/Gen 100, Com/Gen 150, and Com/MP 122 may not be used as electives within the minor.

## The Graduate Program

### Ph.D. Requirements

1. Course Work: Students must take Communication 200ABC, Communication 201ABC, **four** courses in communication history and theory (Communication 205 — Mass Communication: Theory of Analysis; Communication 209 — International Communication; Communication 210 — Information and Society; Communication 215 — Regulation of Telecommunications; Communication 216 — Communication and the Workplace; Communication 220 — The News Media; Communication 225 — The History of Communication Research; Communication 230 — Media Production: Access and Control; Communication 235 — Culture and Ideology; Communication 236 — Popular Culture; Communication 245 — Performance and Audience; Communication 250 — Sound and Image; Communication 260 — Language and Human Communication; Communication 265 — Literacy), Communication 280, and Communication 296.
2. First-Year Evaluation: At the end of the spring quarter of the student's first year, the student must pass a comprehensive written examination based on course work completed during the first year.
3. Language Requirement: All students are required to demonstrate proficiency in one language other than their native language **and** in some second mode of communication. The second mode of communicative proficiency may be an additional language, a computer language, statistics, or demonstrated ability to work in a medium of communication other than speaking and writing (e.g., photography, film, dramatic production, or video).
4. Qualifying Examinations: During or before the end of the third year, the student must take and pass a written qualifying examination. Questions will be taken from two of the three major areas (social force, culture, individual) of the curriculum.
5. Teaching Requirement: In order to acquire teaching experience, all students are required to participate in the teaching activities of the department for six quarters.
6. The nature and requirements of dissertation research vary greatly depend-

## COMMUNICATION

ing upon the specific problem chosen.

- (a) Before work on the dissertation can proceed officially, a formal meeting must be held during which the doctoral candidate discusses the thesis proposal with his or her committee and obtain its approval.
- (b) Following this, the student should remain in frequent consultation with the committee.
- (c) When the dissertation is substantially completed copies are distributed to the committee.
- (d) After reading the draft, the committee meets without the student to discuss it, then notice is given to the student of any changes required. The actual dissertation defense takes place at least one month after the preliminary meeting, after changes are made.
- (e) The final dissertation must be approved by each member of the doctoral committee and filed with the University Librarian. Acceptance of the dissertation by the librarian represents the final step in completing all the requirements for a doctor of philosophy degree.

### Student Advising

Faculty Graduate Adviser:

James V. Wertsch

Faculty Undergraduate Adviser:

Harley Shaiken

Student Services Coordinator: Gregory Griffin, MCC 122A, (619) 534-2379

## Courses

### Lower Division

#### GENERAL COMMUNICATION

##### Com/Gen 20. Introduction to Communication (4)

An historical introduction to the ways in which the means of communication structure human activity. In addition, the idea that the nature of communication is conditioned by the medium of communication will be explored in terms of major theories of information processing, interpersonal interaction, and political-economic power. Staff

##### Com/Gen 20S. Introduction to Communication/Spanish (2)

This course is designed to be taken in conjunction with Communication/General 20. Students are encouraged to reinforce their understanding of the course through reading of Spanish language literature paralleling the topics of the main lecture. Each week students will read a selection in Spanish and discuss it in a mixture of Spanish and English designed to maximize understanding of course content. Students will be asked to write brief papers analyzing the content of the readings and discussion. Must be taken concurrently with Com/Gen 20. Staff

##### Com/Gen 20W. Introduction to Communication/Writing (6)

A writing-intensive version of Com/Gen 20 that teaches written and analytical skills in conjunction with the historical introduction to the ways in which the means of communication structure human activity. Staff

### Upper Division

#### COMMUNICATION AS A SOCIAL FORCE

(Media methods courses are numbered 101-120.)

##### Com/SF 100. Introduction to Communication as a Social Force (4)

A critical overview of areas of macro communication and analysis with special emphasis on media persuasion and social effects. Considers critical and administrative communication theories, the evolution of media delivery systems, and content and media research findings. *Prerequisite: completion of pre-major.* Staff

##### Com/SF 101A. Television Analysis and Production (6)

An introduction to the techniques and conventions common to the production of news, discussion, and variety-format television programs. Particular emphasis will be placed on the choice of camera "point of view" and its influence on program content. Laboratory sessions provide students the opportunity to experiment with production elements influencing the interpretation of program content. Concentration on lighting, camera movement, composition, and audio support. *Prerequisites: Com/SF 100 and Com/Gen 100 or consent of instructor.* Fenner-Lopez

##### Com/SF 101B. Television Documentary (6)

An advanced television course which examines the history, form, and function of the television documentary in American society. Experimentation with documentary techniques and style requires prior knowledge of television or film production. Laboratory sessions apply theory and methods in the documentary genre via technological process. Integrates research, studio, and field experience of various media components. *Prerequisite: Com/SF 101A or consent of instructor.* Fenner-Lopez

##### Com/SF 117. Political Drama as Communication (4)

This course will examine plays by black Americans, British and American women, and Asian dramatists in order to explore theater as a central mode of communication of and to particular political and ethnic communities. We will analyze and compare both historical and aesthetic problems that are particular to black dramatists and female dramatists in their attempts to accurately reflect and affect cultural values and behavior. Emphasis will be placed on black and feminist plays in twentieth-century America; the course will conclude with a brief study of modern theater in China as one attempt to communicate the values of a society through artistic form. *Prerequisite: Com/SF 100 or consent of instructor.* Staff

##### Com/SF 124A-B. Public Opinion and Political Ideology (4-4)

(Same as Pol. Sci. 102DA-102DB.) The structure, origins, and dynamics of public opinion and political ideology. Com/SF 124A considers the nature of public opinion and the factors that shape the development of political ideas — economic interests, psychological functions, political communication and organization, etc. Com/SF 124B examines the development of political ideas in specific historical situations. *Prerequisite: Com/SF 100 or consent of instructor.* Hallin

##### Com/SF 126. The Information Age: In Fact and Fiction (4)

Analysis of the forces propelling the "Information Age." An examination of the differential benefits and costs, and a discussion of the presentation in the general media of the "Information Age." *Prerequisite: Com/SF 100 or consent of instructor.* Schiller

##### Com/SF 128. Information Technology: Culture, Society, Politics (4)

Building upon a framework of neo-Weberian and Marxist interpretations of information technology, this course will address such topics as: the effects of information technology on stratification; the role of the state; the significance of multinational corporations; civil liberties; centralization and decentralization; and mass culture and information technology. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz

##### Com/SF 137. Politics, Philosophy, and Social Science Methodology (4)

(Same as Poli. Sci. 112B.) An introduction to philosophy and the political implications of social science. Topics considered will include the nature of theory and evidence, the formulation of research questions, special problems in the study of human behavior or action and the relation between social science and political policy, events, and ideologies. *Prerequisite: Com/SF 100 or consent of instructor.* Hallin

##### Com/SF 139A-B. The Regulation of Communications (4-4)

This course will examine the rise and functions of regulatory agencies in modern American history, with a specific eye toward the relationship between law and the economy. Our intensive empirical foundation will be the regulation of communications. Administrative law, Federal Communications Commission policies, the treatment of new technologies and deregulation will be covered, building toward analysis of state action and public policy in general. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz

##### Com/SF 165. U.S. Soviet Communication in the Nuclear Age (4)

This course examines some of the ways that the U.S. and the Soviet Union communicate with each other using face-to-face communication, the standard media, and new electronic techniques. Special emphasis is given to a particular topic or technique each quarter that the course is offered. *Prerequisites: completion of pre-major and Com/SF 100, or consent of instructor.* Wertsch

##### Com/SF 166. Discourse and the Nuclear Arms Debate (4)

This course focuses on the forms of speaking and thinking involved in the debate over nuclear arms. The content consists of three basic parts: (1) we will review certain basic facts about nuclear arms and their history; (2) we will outline an approach to modes of discourse (speaking and thinking) that serve as foundation for examining some of the specific arguments that have occurred in the nuclear arms debate; (3) in the third goal of the course we will analyze various texts (books, government documents, films, etc.). *Prerequisite: Com/SF 100 or consent of instructor.* Wertsch

##### Com/SF 172. Sociology of Design (4)

This course will examine design as a social force. This course covers the relationship between design traditions, scientific theories, and technological development and social structure. The design traditions discussed most will be fashion design, city planning, architecture, and garden design. Most literature on these traditions emphasizes the cultural factors shaping historical changes in design. This course will try to see how these cultural factors have interacted with technical and socioeconomic forces. *Prerequisites: completion of pre-major, Com/SF 100, or consent of instructor.* Mukerji

##### Com/SF 174. Popular Culture (4)

(Same as Sociol. 162.) An overview of the historical development of popular culture, with particular emphasis on the growth of the mass media. Lectures and readings cover a variety of the forms of popular culture that have emerged from the early modern period to the present, review major theories explaining how popular culture reflects and/or affects other patterns of social behavior, and discuss the role of popular culture, in general, and the mass media, in particular, in contemporary society. *Prerequisites: Com/SF 100 or consent of instructor.* Horwitz, Mukerji

##### Com/SF 175. Advanced Topics in Communication: Social Force (4)

Specialized study in communication as a social force with topics to be determined by the instructor for any given quarter. May be repeated for credit three times. *Prerequisite: Com/SF 100 or consent of instructor.* Staff

##### Com/SF 178. Mass Communications: Theories, Perspectives, and Methods (4)

This course focuses on the content, technology, and especially the effects of the mass media. It is a course in communications theory, which looks at various major schools of thought concerning the role and effects of mass communications in modern society. How much power do the media possess? What are the assumptions a theorist employs in order to assess such power? What do people "get" from mass-mediated messages? How can we "measure" the effects of mass communication on individuals or on society as a whole? This course is designed to build upon the body of knowledge covered in the Communication 100 series. We will look at major schools of thought in a manner which is both

historical and thematic, beginning with the mass society debate in American sociology as it emerges from nineteenth-century European grand social theory, the audience research literature associated with the empirical work of Paul Lazarsfeld, the "critical" work of the Frankfurt School, Marxist "power structure" theory, "uses and gratifications" research, and some of the more recent literature in semiotics and hermeneutics, which have been adopted in studying mass communication. What is "mass" communication? Lenin and the Frankfurt school. Labeling and the media. Party, democracy in America, and "press freedom." Park and Lippmann. Functionalism. The audience effects tradition. Uses and gratifications. Content analysis and semiology. *Prerequisite: Com/SF 100 or consent of instructor. Horwitz*

**Com/SF 180. Political Economy of Mass Communications (4)**

The social, legal, and economic forces affecting the evolution of mass communications institutions and structure in the industrialized world. The character and the dynamics of mass communications in the United States today. *Prerequisite: Com/SF 100 or consent of instructor. Schiller*

**Com/SF 181. Political Economy of International Communications (4)**

The character and forms of international communications. Emerging structures of international communications. The United States as the foremost international communicator. Differential impacts of the free flow of information and the unequal roles and needs of developed and developing economies in international communications. *Prerequisite: Com/SF 100 or consent of instructor. Schiller*

**Com/SF 183. History of Communication Technologies (4)**

This course will cover the development of the major mass communications technologies: printing, photography, telegraph and telephone, film, radio, and television. Particular attention will be paid to the telegraph/telephone and broadcast media, because a major focus of the course is to analyze the relationship between communication technologies and macroeconomic structures. It is hypothesized that the telegraph/telephone fosters decisive organizational changes in the patterns of capitalist economic production; radio/television fosters decisive social changes in the patterns of consumption. Each of these technological developments will be analyzed in terms of broader patterns of technological innovation in their respective periods of history. There will be some emphasis on the history and evolution of the American Telephone and Telegraph Company (AT&T). Finally, uses of these technologies will be analyzed for the changes in patterns of communication that they create. *Prerequisite: Com/SF 100 or consent of instructor. Horwitz, Mukerji*

**Com/SF 184. Media Analysis (4)**

A systematic study of the means of contemporary information processing in the advanced industrial state. Institutional approaches to and empirical studies of the processing of information will be explored. *Prerequisite: Com/SF 100 or consent of instructor. Schiller*

**Com/SF 185. History of Book Publishing (4)**

This course will cover the history of book publishing from the development of printing in the fifteenth century to the present. Subjects covered will include the relative roles of, (1) technology, (2) the organization of the publishing business, (3) the structure of the book trade, and, (4) the activities of individual editors and publishers in shaping book production. *Prerequisite: Com/SF 100 or consent of instructor. Mukerji*

**Com/SF 186. Film Industry (4)**

A study of the social organization of the film industry throughout its history, addressing such questions as who makes films, by what criteria, and for what audience. The changing relationships between studios, producers, directors, writers, actors, editors, censors, distributors, audience, and subject matter of the films will be explored. *Prerequisite: Com/SF 100 or consent of instructor. Mukerji*

**COMMUNICATION AND CULTURE**

(Media methods courses are numbered 101-120.)

**Com/Cul 100. Introduction to Communication and Culture (4)**

Processes of communication shape and are shaped by the cultures within which they occur. This course emphasizes the ways in which cultural understandings are constructed

and transmitted via the variety of communication media available to members. A wide range of cultural contexts are sampled, and the different ways that available communication technologies (language, writing, electronic media) influence the cultural organization of people's lives are analyzed. *Prerequisite: Completion of pre-major requirements or consent of instructor. Davis, Keyssar*

**Com/Cul 105. Media Stereotypes (4)**

An examination of how the media present society's members and activities in stereotypical formats. Reasons for and consequences of this presentation are examined. Student responsibilities will be: (a) participation in measurement and analysis of stereotype presentations; (b) investigating techniques for assessing both cognitive and behavioral effects of such scripted presentations on the users of media. *Prerequisites: Com/Cul 100 and Com/Gen 100 or consent of instructor. Halleck*

**Com/Cul 108. Images of Women (4)**

An analysis of American stereotypes of women and their use in media images. Student involvement includes (1) reviewing literature on the sociology of sex-roles; (2) developing media portraits of women to serve as data for class analysis; and (3) writing final paper on the stereotypes employed in generating these portraits. *Prerequisites: Com/Cul 100 and Com/Gen 100 or consent of instructor. Staff*

**Com/Cul 112. News Media Workshop (4)**

Designed for students working in student news organizations or off-campus internships or jobs in news, public relations, or public information. A workshop in news writing and news analysis. *Prerequisite: Com/Cul 100, Com/Cul 173 (may be taken concurrently) or consent of instructor. Schudson*

**Com/Cul 113. Theatre Text to Media Performance (6)**

This course will explore the relationships between theatre performance and video and film production of dramatic texts as communication. Beginning with a case study of one dramatic score, and moving to a variety of short dramatic pieces, students will be expected to apply both creative and critical skills to scene study for theatre and film. This course will include consideration of such elements as space, pacing, continuity, choice and preparation of materials, improvisations and relationship to the audience. Students may emphasize one area, such as acting, dramaturgy or camera work, but all members of the class will take on at least two different performance-production tasks during the course. Seminar and workshop format. *Prerequisites: Com/Cul 100 (Com/Gen 100 strongly recommended) or consent of instructor. Keyssar*

**Com/Cul 114. American Theatre on Film (4)**

Extensive examination of major plays from the modern American theatre that have been recorded on film or video. The class will study developing American dramatic themes. American drama as a central mode of communication of the American mythos, and the shaping of American theatre art as a unique twentieth-century cultural phenomenon. Students will attend film screenings and participate in scene presentations from the plays studied to facilitate discussion of these plays as performance. Discussions of the films as interpretations of the plays and comparison of live theatre and film as means of communicating the central strategies of American drama. *Prerequisites: Com/Cul 100 (Com/Gen 100 recommended) or consent of instructor. Keyssar*

**Com/Cul 115. The Theatre of Private Life: Family and Friends (4)**

A close examination of theatre involving a concern for the nature of human interaction and personal interplay, as revealed by conflict within families or small groups. *Prerequisites: Com/Cul 100 (Com/Gen 100 recommended) or consent of instructor. Keyssar*

**Com/Cul 116. Feminist Theatre (6)**

(Same as Drama 186.) This course explores the relationship between dramatic production and theory in a feminist context. Texts as well as methods will be based on examination of such questions as the nature of collaboration, gender as an aspect of role identity, sexual and codes of behavior. This class will create as an ensemble both a live production and a distant video production of a feminist drama. Comparative analysis of video and theatre as potentially feminist media will be included. *Prerequisites: Com/Cul 100 and Com/Gen 100, or consent of instructor.*

**Com/Cul 118. Practicum in Oral History (4)**

Theories, questions, cases, and methods in oral history will be introduced through reading, lecture, and concrete prac-

tice in oral historical research. Topics will include: the relationship between oral history, official history and local history; oral history and social history; voices and stances of the speaker; stances of the ethnographer and the politics of editing; recording and presenting texts; what is social in individual speech. *Prerequisite: Com/Cul 100 or consent of the instructor. Davis*

**Com/Cul 127. Introduction to Folklore and Communication (4)**

Folklore is an important variety of noncommercial communication in societies dominated by commercial media. A source of alternative understandings, folklore is characterized by particular styles, forms, and settings. This course introduces a wide range of folklore genres from different cultures and historical periods, including oral narrative, material folk arts, dramas and rituals. We will pay special attention to the relation between expressive form and social context. Sources include folklore texts, ethnographies, performances on film and videotape, novels, autobiographies, and student observations and experiences. *Prerequisite: Com/Cul 100 or consent of the instructor.*

**Com/Cul 128. Issues in Folklore: Communication, Oral Traditions, and Mass Media (4)**

Local, personal, vernacular, and oral traditions co-exist with and influence the mass-produced, mass-mediated culture of the late twentieth century. This course examines the history of this influence, uses materials such as oral histories, life stories, urban legends, and soap operas to explore the conjunctions of folklore and commercially produced entertainments in everyday social life. *Prerequisite: Com/Cul 100, Com/Cul 127, or consent of the instructor. Davis*

**Com/Cul 133. Work, Culture, and Communication (4)**

This course introduces the notion that labor and communication are conjoined social forces which powerfully determine culture and society. We will explore this conjunction and its relationship to society using materials and ideas drawn from mass communication research, labor history, anthropology, sociology, literature, and folklore. Topics will include: the history of the shift to industrial production as a reorganization of work as a communication medium; industrial folklore and work culture; changing images of work and workers; scientific management as control of social communication; the role of communication technologies on workplaces and work processes. *Prerequisite: Com/Cul 100 or consent of the instructor. Davis*

**Com/Cul 144. Language and Society (4)**

This course deals with the socioeconomic forces affecting the evolution of standardization of language, bilingualism, diglossia, and language maintenance. These processes are studied particularly in relation to the Spanish and English language in the United States. *Prerequisite: Com/Cul 100 or consent of instructor. Staff*

**Com/Cul 146. Culture and Thought (4)**

(Same as Psych. 146.) An examination of the major theories and relevant data concerning the way in which culturally organized experience influences the nature of thinking. Historical records, anthropological field reports and experiments will be examined for the senses in which they are relevant to understanding presumed relations between culture and thought. Particular emphasis will be placed on the kinds of conclusions that can be supported by different kinds of data, and the shifting meaning of basic terms when one surveys different areas of research on this topic. *Prerequisite: Com/Cul 100 or Com/HIP 100. Cole*

**Com/Cul 160. Sociology of Visual Knowledge (4)**

(Same as Sociol. 173.) This course will cover four different uses of media images as documents of natural events: documents of families (home movies, family photographs), educational documentaries, media images for scientific research, and conventional documentary films. Classes will include discussion of and lectures about characteristics of those situations in which these types of images are produced and interpreted as well as the methods people use to evaluate and interpret these kinds of visual information. *Prerequisite: Com/Cul 100 or consent of instructor. Mukerji*

**Com/Cul 169. Culture, Ideology, and Collective Memory (4)**

(Same as Lit/Gen 169.) How do societies remember (and forget) the past and, through this process of collective memory, conceive their present? What stories are stored, who constructs them, and what purposes do they serve? Readings in the theory of ideology and close study of empirical cases. *Prerequisite: Com/Cul 100 or consent of instructor. Schudson*

## COMMUNICATION

### Com/Cul 170. Advertising and Society (4)

(Same as Sociol. 164.) Advertising in historical and cross-cultural perspectives. Topics will include: the ideology and organization of the advertising industry, the meaning of material goods and gifts in capitalist, socialist and nonindustrial societies, the natures of needs and desires and whether advertising creates needs and desires, and approaches to decoding the messages of advertising. *Prerequisite:* Com/Cul 100, or consent of instructor. Schudson

### Com/Cul 173. The American News Media (4)

(Same as Sociol. 165 and Poli. Sci. 1021.) History, politics, social organization, and ideology of the American news media. Special attention will be paid to: historical origins of journalism as a profession and "objective reporting" as ideology; empirical studies of print and TV journalism as social institutions; news coverage of Vietnam and its implications for theories of new media. *Prerequisite:* Com/Cul 100 or consent of instructor. Schudson, Hallin

### Com/Cul 175. Advanced Topics in Communication: Culture (4)

Specialized study in communication and culture with topics to be determined by the instructor for any given quarter. May be repeated for credit three times. *Prerequisite:* Com/Cul 100 or consent of instructor. Staff

## COMMUNICATION AND HUMAN INFORMATION PROCESSING

(Media methods courses are numbered 101-120.)

### Com/HIP 100. Introduction to Communication and Human Information Processing (4)

A good deal of scholarship concerning the interaction of human beings with various means of communication suggests that different media permit or promote differently structured messages. A wide variety of claims concerning media-individual interactions are made beginning with suggestions that language affects thought through claims about the consequences of literacy to suggestions about the influence of electronic media on individual and group behavior. This course will teach the student how to analyze such claims by examining the kinds of data on which they are based and current techniques in the social sciences for their evaluation. *Prerequisite:* completion of pre-major requirements or consent of instructor. Cole, Padden

### Com/HIP 100W. Introduction to Human Information Process/Writing (2)

This course is designed to be taken in conjunction with Com/HIP 100. A writing-intensive version of HIP 100 that teaches written and analytical skills in conjunction with a maximized understanding of course content. Must be taken concurrently with Com/HIP 100. Staff

### Com/HIP 104A-B. Theory of the Production of Moving Images (4-4)

Complex messages, no matter what the content, generally provide clues for preferred interpretations. This course will explore the means by which such clueing is done in film/video. Students will focus on the relationship between the viewer and the maker of moving images through viewing and analysis, theoretical readings, and their own scripting and film/video production. *Prerequisites:* Com/HIP 100, Com/Gen 100, Com/SF 101A-B, or consent of instructor. Halleck

### Com/HIP 110. Media Effects (4)

This course examines the unique effects of print, film, and television on human behavior and information processing. Special emphasis is given to television's effects on beginning viewers. The course will emphasize the difficulties of testing causal hypotheses about media effects on individuals. Controversies surrounding media effects will be examined from both historical and contemporary social science perspectives. *Prerequisite:* Com/HIP 100 or consent of instructor. Padden

### Com/HIP 111. Communicating and Computers (4)

This course explores the effects of active computer-based media on future communications. It starts with an introduction to computers, with a focus on the interactive use of personal computers. Students will explore ways of using computers to construct active communication networks, including teleconferencing and interpersonal interaction with simulated worlds. *Prerequisite:* Com/HIP 100 or consent of instructor. Staff

### Com/HIP 112. Frontiers of Communication (4)

This course will explore new communication technologies, their impact on the structure of communication, and the side effects of these likely impacts on individuals and on the society. Students will apply the analytical techniques of projection, scenario construction, and analogical comparison and simulation to determine outcomes and side effects. New technologies for transmission channels (optical fibers, communication satellites), video and digital storage (video disks), and computation (personal computers, information utilities) will be examined. *Prerequisite:* Com/HIP 111 or consent of instructor. Staff

### Com/HIP 114. Bilingual Communication (4)

This course is designed to introduce students to recent research techniques in bilingual communication. Students will begin by analyzing the results of recent research on bilingual and monolingual interactions in different settings. The course will then turn to methods of assessing the processes and strategies of communication. These activities will primarily include observations of video-taped bilingual and monolingual communicative interactions in classrooms and tutorial lessons in the analysis of video tape records of such interactions. *Prerequisites:* Com/HIP 100 and Com/Gen 100 or consent of instructor. Staff

### Com/HIP 116. Practicum in Child Development (4)

(Same as Psych. 128.) This course is intended as a combined lecture and laboratory course for seniors in psychology and communication. Their backgrounds should consist of a solid foundation in general psychology or communication and human information processing. The course will meet for two hours a week of lectures and discussion. Students will be expected to spend four hours of supervised practical experience in a field setting involving children. An additional six hours of student time will be devoted for reading, transcribing field notes, and writing a paper on some aspect of the field work experience as it relates to class lectures and readings. Evaluation of the course will be based on performance in classroom discussion, the judged quality of the students' fieldwork, and the quality of the term paper. *Prerequisites:* Com/HIP 100 or consent of instructor. May be repeated three times for credit. Cole

### Com/HIP 117. Language, Thought, and the Media (4)

This course examines the ways in which various communicative channels mediate human action and thought. A basic premise of the course is that human thought is shaped in important ways by the communicative devices used to communicate. There is a particular emphasis on how thought develops, both historically and in the individual. *Prerequisites:* Com/HIP 100 and Com/Gen 100 or consent of instructor. Wertsch

### Com/HIP 121. Literacy, Social Organization, and the Individual (4)

(Same as Psych. 173.) This course will examine the historical growth of literacy from its earliest precursors in the Near East. The interrelation between literate technology and social organization and the impact of literacy on the individual will be twin foci of the course. Arriving at the modern era, the course will examine such questions as the impediments to teaching reading and writing skills to all normal children in technological societies and the relation between literacy and national development in the Third World. *Prerequisite:* Com/HIP 100, or Com/Cul 100, or consent of instructor. Cole

### Com/HIP 122A-B. Communication and the Community (4-4)

This course will prepare students to conduct research in a variety of community settings on the institutional and media-derived patterns of communication that affect people's everyday lives. During the first quarter students will visit community settings in San Diego (especially settings involved in teaching literacy skills) and identify a specific area of study (e.g., community or parental attitudes toward the use of two languages to instruct in schools). As they focus on the problem they will study the different methods of research (survey, participant observation, etc.). Evaluation will be by exams and a final paper. These papers will be used as a preliminary proposal for the second quarter project. During the second quarter students will carry out the study proposed during the first quarter. Evaluation will be by close supervision of the students' research techniques and the final research project. *Prerequisite:* Com/HIP 100 or consent of instructor. Staff

### Com/HIP 123. Children and Media (4)

(Same as Psych. 182.) A lecture course which analyses the influence of media on children's behavior and thought processes. The course takes an historical perspective, beginning

with children's print literature, and encompasses movies, music, television, and computers. The focus of the course is analytical; students will study specific examples of media products intended for children and apply various analytical techniques including content analysis and experimentation to these materials. *Prerequisites:* Com/HIP 100 or consent of instructor. Cole

### Com/HIP 134. Language and Human Communication (4)

Introduction to analysis of structure and content of human language communication. Difference in communicative styles among different cultural groups will be compared and contrasted. Situations resulting in communication breakdown such as interethnic miscommunication and cases of language pathology (schizophrenia and language delay) will be examined as a technique for understanding properties of human communicative systems. *Prerequisite:* Com/HIP 100 or consent of instructor. Padden

### Com/HIP 143. The Psychology of the Filmic Text (4)

(Same as Psych. 174.) The course will examine a variety of films using different perspectives and methods of psychology to analyze the types of problems raised by the nature of cinematic communication. Topics will include an introduction to basic elements of cinematography, theoretical and technical bases of film's "grammar," perception of moving pictures, the function and status of sound, the influence of film on behavior and culture (and vice versa), the representation of psychological and social interaction, the communication of narrative and spatial information formation, the generation and translation of film's conventions, and the parameters which the medium and the culture impose upon the attempt to express various forms of abstraction in the concrete visual language of film. *Prerequisite:* Com/HIP 100 or consent of instructor. Keyssar

### Com/HIP 175. Advanced Topics in Communication: Human Information Processing (4)

Specialized study in communication: human information processing with topics to be determined by the instructor for any given quarter. May be repeated for credit three times. *Prerequisite:* Com/HIP 100 or consent of the instructor. Staff

## GENERAL COMMUNICATION

### Com/Gen 100. Introduction to Media Use in Communication (4)

Students will develop projects that will help them explore theories of communication by using communication media. Students with "media cards" can use film and/or video for these projects, but not all students will be required to do so. They can use computers, pen and paper, photography, posters or create parades and/or other performances. The purpose of the course is to link theory to concrete manipulation of any communication form. *Prerequisite:* completion of pre-communication major or consent of instructor. Mukerji

### Com/Gen 110. Media Methods for Communication Research (4)

Students will apply media knowledge and experience to research issues in documentation, analysis-methodology, experimentation, etc., through projects currently being conducted by faculty members. Each student will select a particular faculty member to work with. Students and faculty will participate in a weekly seminar meeting where issues, ideas, problems, and media methods relevant to research will be discussed. During the quarter each student will make a presentation to the seminar of the research project with which he or she is associated, and will prepare a final paper describing the research objectives through the projects, and his or her findings and conclusions. May be taken three times for credit. *Prerequisites:* Com/SF 100, Com/Cul 100, Com/HIP 100 and Com/Gen 100, or consent of instructor. Staff

### Com/Gen 150. Integrative Seminar in Communication (4)

A major goal will be to assist the student in integrating information about communication phenomena which are ordinarily considered as discrete topics, showing how individual behavior and social phenomena interact, and how these interactions are conditioned by dominant means of communication. It will reexamine the fundamental issues to which students were exposed in the introductory course and in their core courses. These issues center on the ways in which the means of communication mediate human behavior at different levels of social interaction for different purposes. Each of the major means of communication — language, writing, print, radio, television, and film — will be the subject of a two-



week long "subunit." For each subunit students will discuss the social conditions under which the medium arose in the course of human history and is used in the modern world, the key features of the process of communication in each medium, and the consequences for society and the individual of some aspect of current social practices. *Prerequisite: SENIOR communication majors only or consent of instructor.*

**Com/Gen 175. Advanced Topics in Communication: General (4)**

Specialized study in communication: General with topics to be determined by the instructor in any given quarter. May be repeated for credit three times. *Prerequisite: Com/Gen 100 or consent of instructor.*

**Com/Gen 195. Instructional Assistance in Communication (4)**

Observation and critique of classroom procedures and content. Assisting in the instruction of a lower-division undergraduate communication course under the supervision of a faculty member. May be taken twice for credit. (P/NP grades only.) *Prerequisites: attendance in course in a previous quarter and a grade of B or better, and consent of instructor.* Staff

**Com/Gen 198. Directed Group Study in Communication (4)**

Directed group study on a topic or in a field not included in the regular curriculum by special arrangement with a faculty member. (P/NP grades only.) May be taken three times for credit. *Prerequisites: Com/SF 100, Com/Cul 100, Com/HIP 100, and consent of instructor.* Staff

**Com/Gen 199. Independent Study (4)**

Independent study and research under the direction of a member of the staff. (P/NP grades only.) May be taken three times for credit. *Prerequisites: Com/SF 100, Com/Cul 100, Com/HIP 100, and consent of instructor.* Staff

## MEDIA PRODUCTION COURSES

(The following courses may only be used as an *elective* in the major.)

**Com/MP 122. Television as a Social Force (4)**

Primarily a research and production course. Students undertake the research, design, and production of a series of videotaped programs that serve some pressing social need. *Prerequisite: Com/SF 101B or consent of instructor.* Fenner-Lopez

## Graduate

**Com 200A. Introduction to the Study of Communication as Social Force (4)**

This course focuses on the political economy of communication and the social organization of key media institutions. There will be both descriptive and analytical concerns. The descriptive concern will emphasize the complex structure of mass communication industries and organizations, both historically and cross-nationally. The analytic focus will examine casual relationships between economic and political structure of societies, the character of their media institutions, public opinion, and public attitudes and behaviors expressed in patterns of voting, consuming, and public participation. The nature of evidence and theoretical basis for such relationships will be critically explored. Hallin, Schiller

**Com 200B. Introduction to Study of Communication: Communication and Culture (4)**

This course focuses on questions of interpretation and meaning. This course will examine how people use texts to interpret the world and coordinate their activities in social groups. Students will study both theories of interpretation in the conventional sense and theories about the act of interpreting. Davis, Keyssar

**Com 200C. Introduction to the Study of Communication: Communication and the Individual (4)**

This course will draw on theorists who examine human nature as constituted by social, material, and historical circumstances. This course considers the media in relation to the ontogenetic and historical development of the human being and an examination of the individual as socially constituted in a language-using medium. The role of new communication technologies as part of research methodologies is explored in lecture-seminar. Cole, Padden

**Com 201A. Methods in the Study of Communication: Social Force (4)**

This course is an introduction to social science as a form of knowledge and to two basic methodologies in the study of communication as a social force: survey analysis and policy analysis. This is a course in the logic of inquiry. The focus is not on particular techniques — sampling techniques in survey research, for instance — but on general concepts: the notion of a model, what it means to operationalize a theoretical concept; the problems of reliability and validity in measurement, etc. Hallin, Schiller

**Com 201B. Methods in the Study of Communication and Culture (4)**

Students will be introduced in this course to several modes of textual analysis including semiotics, structuralism, deconstruction, and psychoanalytic interpretation. Their second area of focus will be training in ethnographic methods and evaluation of ethnographic studies. Davis, Keyssar

**Com 201C. Methods in the Study of Communication and the Individual (4)**

This class seeks to prepare students to evaluate individual psychological processes in the context of a broad "mediational" approach to language and thought. Two methodological issues are highlighted. The contrast between experimental and correlational techniques of data analysis, and the analysis of linguistic communication. Cole, Padden

**Com 205. Mass Communication: Theories of Analysis (4)**

This course centers on power and the special role of mass media in modern society. The course will investigate the assumptions a theorist employs in order to assess media power; it will inquire how a theorist "measures" the effects of mass communication on individuals or on society as a whole. It will examine the major schools of mass communication theory. Horwitz

**Com 209. International Communications (4)**

This course will examine the material infrastructure of communication flows internationally, focusing on the major transmitters and categories of the messages and imagery. Emphasis will be placed on the impact of international communication on national sovereignty and the character of economic development. Schiller

**Com 210. Information and Society (4)**

The social, legal, and economic forces affecting the evolution of mass communication institutions and structure in the industrialized world. Differential impacts of the free flow of information and unequal roles and needs of developed and developing economies. Schiller

**Com 215. Regulation of Telecommunications (4)**

The course will look at the history of, and rationales for, the regulation of mass communications in the United States. The course will cover both broadcasting and common carrier regulation. We will analyze telecommunications regulatory structures as they were constituted historically with the 1934 Communications Act, and examine their breakdown in the late 1970s. In a larger vein, the course will examine the rise and functions of regulatory agencies in modern American history. Horwitz

**Com 220. The News Media (4)**

History, politics, social organization, and ideology of the American news media. Special attention will be paid to: Historical origins of journalism as a profession and "objective reporting" as ideology; empirical studies of print and TV journalism as social institutions; news coverage of Vietnam and its implications for theories of the news media. Schudson

**Com 225. Historical Research in Media (4)**

In this course we will discuss the value of historical research in developing theories of media development and media effects; we will also examine skills and resources for conducting historical research. Mukerji

**Com 230. Media Production: Access and Control (4)**

This course will engage students in planning and executing a video production. At each step, from conceiving an idea to seeking funding for production, to interacting with people and institutions during production, to editing, to seeking broadcast access, the course will examine the politics of video production or, if you will, the "micro-politics" that influence and constrain production and its dissemination. Halleck

**Com 235. Culture and Ideology (4)**

This course will examine the concept of culture from a variety of viewpoints in the social sciences and humanities: 1) culture as conceived of as a "style" of a person, group, or class; 2) culture as a cognitive system or framework of perception — culture as class rule or as preconscious constraints on thoughts; and 3) culture as the artifacts produced by societies or social organizations — culture as industrial construction or as professional construction. Schudson

**Com 236. Popular Culture (4)**

This class will be an opportunity for students to review major contributions to the field from the disciplines of anthropology, history, literature, sociology and American studies, and to experiment with some of the recently developed methods for studying popular forms. They will then be able to consider more precisely the potential and actual contribution of studies of popular culture to the discipline of communication. Mukerji

**Com 245. Performance and Audience (4)**

This course will explore the history and nature of audience as a concept and phenomenon. The first half of the term will be spent surveying the historical nature of the relations of audience to performance and to social groups. The second half of the course will address modern and contemporary aspects of audience, taking into consideration the effects of radio, film and television on audience and nature of audience in contrasting cultures such as that of contemporary China and the United States. Keyssar

**Com 250. Sound and Image (4)**

This course will explore the structure and strategies of oral and visual representations, in particular as they are organized into systems of meaning in film, television, and photography. Changes in the nature and function of imaging over time as well as the interrelationship of sound and visual image will be explored. Narrative and point of view will be key concerns. Cole, Keyssar

**Com 260. Language and Human Communication (4)**

Introduction to analysis of structure and content of human language communication. Differences in communicative styles among different culture groups will be compared and contrasted. Situations resulting in communication breakdown such as interethnic miscommunication and cases of language pathology (schizophrenia and language delay) will be examined as a technique for understanding properties of human communicative systems. Padden

**Com 265. Literacy (4)**

This course will examine the historical growth of literacy from its earliest precursors in the Near East. The interrelation between literate technology and social organization and the impact of literacy on the individual will be twin foci of the course. Arriving at the modern era, the course will examine such questions as the impediments to teaching reading and writing skills to all normal children in technological societies and the relation between literacy and national development in the Third World. Cole

**Com 275. Topics in Communication (4)**

Specialized study in communication with topics to be determined by the instructor for any given quarter. *Prerequisite: graduate standing or permission of the instructor.* Staff

**Com 280. Advanced Workshop in Communication Media (4)**

This course is a project course in which students prepare a production or experiment using one of the forms of media. The course is designed to allow students to experiment in a communication form other than the usual oral presentation in class or a term paper. Students can do video production, a coordinated photographic essay or exhibit, a computer instructional game, a published newspaper or magazine article directed at a special audience, a theatrical presentation, or some form other than those mentioned. May be repeated for credit six times. Staff

**Com 296. Communication Research as an Interdisciplinary Activity (4)**

A course oriented toward a re-analysis of communication as a discipline. The content of this course is to provide the student with as well-integrated a framework as possible for initiating strong communication research in the dissertation. Staff

**Com 298. Directed Group Study (1-12)**

The study and analysis of specific topics to be developed by a small group of graduate students under the guidance of an interested faculty member. Staff

## CONTEMPORARY ISSUES

### Com 299. Independent Graduate Study (1-12)

Advanced independent study in communication under the guidance of Department of Communication faculty. Staff

### Com 500. Practice Teaching in Communication (4)

A doctoral student in communication is required to assist in teaching undergraduate Department of Communication courses for a total of six quarters. One meeting per week with the instructor, one meeting per week with the assigned sections, and attendance at the lecture of the undergraduate course in which he or she is participating are part of this requirement. *Prerequisites: graduate standing and consent of instructor.* Staff.

## COMPARATIVE STUDIES IN LANGUAGE, SOCIETY, AND CULTURE

OFFICE: 220 Humanities Building,  
Third College

### Program Directors:

George Anagnostopoulos, *Department of Philosophy*  
H. Stuart Hughes, *Department of History*  
Roy Harvey Pearce (*Chairman*),  
*Department of Literature*  
Roger Reynolds, *Department of Music*  
Melford E. Spiro, *Department of Anthropology*

Graduate students in the humanities, social sciences, and arts in this program, and under guidance of an interdepartmental committee, are given the opportunity to design strongly interdisciplinary curricula, on the basis of which they write their dissertations. The program requires that the student be admitted and fundamentally trained in one discipline and that he or she undertake M.A.-level studies in an integrally related discipline or culture area. The qualifying examination will cover the whole of the student's studies, although its structure will be that designed by the department in which the student is fundamentally trained.

Application to the Program in Comparative Studies may be made at the earliest during the student's third quarter of residency in his or her primary department. From the point of acceptance into the program, the student's work will be under the supervision of an interdisciplinary committee, which will conduct the examination for Ph.D. candidacy, approve all study and research plans including the dissertation proposal, and forward them to the Graduate Council for final approval. The degree granted will indicate in its title the precise nature of the student's studies and research — e.g., Ph.D. in Comparative Literature and Ethnopoetics, in Linguistics and Literary

Studies, in Economics and Chinese Studies, in Philosophy and the History of Ideas. Students applying for admission to UCSD and interested in applying for admission to the program should direct their inquiries to a primary department. Students already admitted to a primary department should, after the required quarters of residence and with the advice of a departmental adviser, direct inquiries to the chairperson of the program.

## COMPUTER SCIENCE AND ENGINEERING (CSE)

See Engineering, Division of.

## CONTEMPORARY BLACK ARTS PROGRAM

OFFICE: 240 Third College Humanities Building

### Director:

Floyd Gaffney, Ph.D.

### Faculty:

James Cheatham (*Senior Lecturer with Security of Employment in Music*)  
John H. Douglass, Ph.D. (*Supervisor in Physical Education*)  
Edith Fisher, M.L.S. (*Adjunct Lecturer*)  
Floyd Gaffney, Ph.D. (*Professor of Drama*)  
Luther James (*Associate Professor of Drama*)  
Glenn L. Jones (*Visiting Lecturer in Music*)  
Helene Keyssar, Ph.D. (*Professor, Communication*)  
Sandra Foster-King (*Visiting Dance Lecturer in Drama*)  
Cecil Lytle, B.A. (*Professor of Music*)  
Faith Ringgold, M.A. (*Professor of Visual Arts*)  
Julie Saville, M.A. (*Acting Assistant Professor of History*)  
Charles W. Thomas, II, Ph.D. (*Professor of Urban Studies and Planning*)  
Sherley Anne Williams, M.A. (*Professor of Literature*)

### The Minor

The Contemporary Black Arts Program is an interdisciplinary minor which provides a broad introduction to an appreciation of Afro-American performing arts through lecture, studio courses, and public performance. Students who complete the minor must meet the following requirements:

1. A required core of the following three lecture courses:

Theatre 16. Introduction to Black Drama (4) (S)

Literature/English 182B. Development of Afro-American Literature (4) (F)

Music 127A. Music of Black Americans (4) (W)

2. A fourth lecture course selected from the following approved list:

Theatre 141. Modern Black Drama (4) (W)

Literature/English 182B. Development of Afro-American Literature (4) (F)

Literature/English 183. Themes in Afro-American Literature (4) (F)

Literature/English 184. Afro-American Poetry (4) (W)

Theatre 187A. Black Theatre Ensemble (4) (F)

Music 126. Introduction to Oral Music (4) (F)

Music 127B. Music of Black Americans (4) (S)

History 159A-B. Afro-American History (4) (W,S)

History 7A. Race and Ethnicity in the U.S. (4) (F)

VA 1. Introduction to Art (4) (W,S)

Comm/SF 117. Political Drama as Communication (4) (F)

USP 150. The Black Ghetto (4) (W)

P.E. 121. The Black Athlete (4) (S)

3. Completion of a total of eight units of performance courses selected from the following approved list:

Music 95G. Gospel Choir (2) (F,W,S)

Music 95J. Jazz Ensemble (2) (F,W,S)

Music 131. Jazz Improvisation (4) (F,W,S)

Theatre 125. Dances of the World (4) (W,S)

Students interested in either taking Contemporary Black Arts Program courses or completing the minor are encouraged to discuss their interests and develop a course of study with a faculty member of the program at their earliest convenience.

## CONTEMPORARY ISSUES

OFFICE: 2024 Humanities and Social Sciences Building, Muir College

### Director:

To be appointed.

### Courses

#### Lower Division

#### 2. Seminars (Titles and Topics Vary) (2,3,4)

Seminars directed by members of the UCSD faculty and visiting professors, and treating in depth one contemporary issue or small group of related issues. (Consult the *Schedule of Classes* for possible offerings.) (F,W,S)

#### 20. The Wilderness and Human Values (4)

The value and significance of the wilderness for contemporary man considered in terms of ecology, anthropology, literature, and recent history. Includes one mandatory field trip lasting several days.



**22. Human Sexuality (4)**

A survey of the nature and problems of human sexuality in the development of the individual, in cultural traditions and values, and in social roles and organizations, particularly with regard to contemporary America. L. Ross

**23. Living and Learning in a Modern University (2)**

An examination of the problems, opportunities, and choices confronting undergraduates at a large research-oriented university such as UCSD. Particular attention is given to major issues in personal development during the undergraduate years.

**50. Information and Academic Libraries (2)**

An introduction to research strategies directed at satisfying the information needs of the student using the academic library, with emphasis on the UCSD library system. Library techniques will be acquired through lectures and discussion, problem sets, and a term project. Students will learn to extend these techniques to independent research.

**96. Contemporary Issues Workshop (4)**

Prepares students to serve as discussion leaders for Contemporary Issues 20. Includes library research and field trips. (Students selected to be discussion leaders must have obtained upper-division status by the time they serve.) (P/NP grades only.) *Prerequisite: C.I. 20 or consent of instructor.*

**98. Group Studies in Contemporary Issues (4)**

Further preparation for service as discussion leaders in Contemporary Issues 20. Emphasizes joint projects and peer review. (P/NP grades only.) *Prerequisite: C.I. 96 or consent of instructor.*

## Upper Division

**136. Anthropology of Medicine (4)**

(Same as Anthro 128.) Theoretical approaches to and cross-cultural analyses of the role of the medical profession, the sick and the healers, and culture as communication in the medical event. The theoretical anthropological aspects of medical practice and medical research will include a consideration of the "Great Traditions" of medicine as well as primitive and peasant systems. Western medicine will be considered in the foregoing framework with issues of contemporary concern by way of introduction. *Prerequisite: upper-division standing.* L. Ross

**140. Healing Arts in Cultural Perspective (4)**

(Same as Anthro 178.) We review medical systems in a broader, cultural base and their transformation in acculturation, e.g., empirical analysis of non-Western medical practices, social structure and ritual in biomedicine, symbols and healing, psychiatry and its problematics in transcultural application. *Prerequisite: upper-division standing.* L. Ross

**195. Discussion Leading in Contemporary Issues (4)**

Students will lead groups of ten to twenty students in discussions of contemporary concern. Students will meet with the professor to plan and prepare for their discussions to be held weekly. Students will also consult with another faculty member specializing in their topics for further check on reading materials and course of discussion. (P/NP grades only.) *Prerequisite: Contemporary Issues 96 or 196 and for those serving in Contemporary Issues 20, 98 or 198, and consent of the director of Interdisciplinary Sequences.*

**196. Contemporary Issues Workshop (2)**

A workshop for potential discussion leaders in the Contemporary Issues Program. Students will investigate topics for discussion and methods of presentation and inquiry. Participating in the workshop does not guarantee selection as discussion leader. (Offered fall quarter only.) (P/NP grades only.)

**198. Group Studies in Contemporary Issues (4)**

Group studies, readings, projects, and discussions in areas of contemporary concern. Course is set up so that students may work together as a group with a professor in an area of contemporary concern whereby the group emphasis would be more beneficial and constructive than individual special studies. *Prerequisite: consent of instructor.* (P/NP grades only.)

**199. Special Studies in Contemporary Issues (2-4)**

To be offered during fall, winter and spring quarters. Permission of the director of Interdisciplinary Sequences is required. The 199 course is to be made up of individual reading and projects in the areas of contemporary concern. Term pa-

per and/or completed project is required. This class is given under special circumstances, e.g., student abroad. (P/NP grades only.)

**Community Medicine 236. Medical Anthropology (3)**

An analysis and synthesis of the growing body of anthropological concepts and investigations concerned with illness and curing events from primitive cultures to complex urban societies, and their relevance to medical practice. L. Ross (W)

## CULTURAL TRADITIONS

OFFICE: 2024 Humanities and Social Sciences Building, Muir College

**Director:**

To be appointed.

\* \* \*

Each year several different three-course sequences are offered. The sequences are developed by a special committee. The particular cultures to be studied vary from year to year, though some, such as the Judaic culture studies, have attracted such widespread interest that they may be carried over from one year to the next. Other sequences have been offered in such cultures as Asian, Latin American, Mediterranean, Chicano, and American Indian.

A descriptive list of the sequences offered for the coming academic year is available in time for the fall enrollment. Inquiries about the program or projected sequences should be addressed to the office of the program.

## Courses

**1A-B-C. Cultural Traditions (4-4-4)**

A three-quarter sequence involving the study of the deep and surface structures of the life-style of one specific culture. The approach from several disciplines addresses itself to analyses of the social, political and economic institutions, the aesthetic structuring through formal artistic expression, and the cultural forms of everyday living. (F,W,S)

## EARTH SCIENCES

OFFICE: 1512 Humanities/Undergraduate Library Building, Revelle College

Developments in the discipline of the earth sciences suggest that the most effective means for undergraduates to enter this fascinating field is for the university to enrich its course work for majors in the Departments of Chemistry and Physics with contemporary and exciting courses in the earth sciences. These enrichment courses are taught by faculty members of the Scripps Institution of Oceanography.

The program is one which is based on the premise that a thorough grounding in one of the above disciplines is necessary. Thus an entering student will for the first two years take the Revelle core curriculum, or its equivalent, and then elect to enter the Department of Chemistry or Physics. At the beginning of the junior year, a student will select courses in consultation with the earth sciences advisers in the Geological Sciences Group in the Scripps Institution of Oceanography and his or her own major department. In most instances the student may be able to substitute earth sciences courses for major requirements or restricted electives.

The degree will be granted by the major department and will indicate that the student's education has been enriched in the earth sciences (e.g., B.A. in chemistry with specialization in earth sciences).

A student who plans to graduate with a specialization in earth sciences must complete ES 101, 102, 103, 120, and SIO 256A and two additional upper-division courses as a minimum course requirement. Additional courses for the earth sciences specialization will be selected with the aid of the earth sciences advisers. Because of course scheduling and prerequisites the normal sequence of courses begins with the series ES 101, 102, 103, 120.

This interdisciplinary program will provide the student the information to make the choice of a graduate major with the freedom that an undergraduate major in a basic science provides. This program will not impede progress in such a basic science and will provide a concrete example of such sciences applied to earth problems.

## Courses

### Lower Division

*Lower-division courses not intended as substitutes for ES 101.*

**1. The Oceans (4)**

Presents modern ideas and descriptions in the physical, chemical, biological and geological aspects of oceanography, and considers the interactions between these aspects. Intended for students interested in the oceans, but who do not necessarily wish to become professional scientists. (Previously interdisciplinary 1.) Three hours' lecture, one hour discussion. *Prerequisite: some background in high school chemistry recommended.* W. Berger and SIO Staff (F)

**4. The Nature of the Earth (4)**

Descriptive introduction to earth science. Emergence of our present knowledge of the earth's interior, mantle, crust, oceans, and atmosphere, through the study of gravity, seismology, magnetism, radioactive dating, heat flow, dynamics, and chemistry. Relations to environment and to space exploration. Three hours' lecture. These courses (The Oceans) and (The Nature of the Earth), with Physics 5 (The Skies), form a three-course sequence for general interest in science (W)

## ECONOMICS

### Upper Division

*Prerequisites for all upper-division earth science courses: one year of the Revelle natural science sequence or equivalent and one year of mathematics.*

#### 101. Introductory Geology (4)

The origin and evolution of the earth, especially its crust, and the evolution of life as indicated by the fossil record. Emphasis is on the nature of rocks and minerals, their origin, reconstruction and decay; the evolution of continents, ocean basins, and mountain belts, processes of vulcanism; and the work of wind, water, and glaciers in modifying the earth's surface, with the aim of creating an awareness in the student of the geological environment in which we live. Three lectures, two laboratory periods, occasional field trips. SIO Staff (F)

#### 102. Introductory Geochemistry (4)

The chemistry of the earth and the solar system, and the applications of physical chemistry and nuclear physics to the study of the origin and geological history of the earth. Cosmic and terrestrial abundances of elements; nucleosynthesis; origin of the earth; mineralogy and chemistry of the earth's crust, mantle, and core; geochronology and the geological timescale; chemistry of the atmosphere and the oceans. Three lectures, one discussion period. *Prerequisite: ES 101.* J. Bada and J.D. Macdougall (S)

#### 103. Introductory Geophysics (4)

A survey course covering the use of physical measurements to determine the structure and composition of solid earth. Discussions will include an introduction to earthquake seismology, isostasy, the gravity and magnetic fields of the earth, and use of gravity, magnetism, and seismic methods for exploration. Knowledge of the earth's interior as determined from geophysical methods. *Prerequisite: ES 101.* (W)

#### 120. Mineralogy (4)

Lectures and laboratory work on symmetry, morphology, gonometry, crystal structure, elementary x-ray crystallography, physical and chemical properties of minerals and recognition of common rock-forming minerals. Use of the petrographic microscope in the study of rock-forming minerals. Two three-hour periods of laboratory and lecture. *Prerequisites: ES 101 and 102.* M. Kastner (F)

#### 198. Directed Group Study (2-4)

This course will cover a variety of directed group studies in areas not covered by formal departmental courses. (P/NP grades only.) *Prerequisite: consent of instructor.*

#### 199. Independent Study for Undergraduates (4)

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) (F,W,S)

NOTE: Also see "Courses, Curricula, and Programs of Instruction: Scripps Institution of Oceanography."

## ECONOMICS

OFFICE: 210 Third College Social Science Building

### Professors:

Richard Attiyeh, Ph.D.  
Donald V.T. Bear, Ph.D.  
John Conlisk, Ph.D.  
Vincent Crawford, Ph.D.  
Robert F. Engle, Ph.D.  
Clive W.J. Granger, Ph.D.  
Theodore Groves, Ph.D. (Chairman)  
Walter P. Heller, Ph.D.

John W. Hooper, Ph.D. (Emeritus)  
Ramu Ramanathan, Ph.D.  
Michael Rothschild, Ph.D.  
Ross Starr, Ph.D.  
Halbert White, Ph.D.

### Associate Professors:

Jose Luis Guasch, Ph.D.  
Mark J. Machina, Ph.D.  
Dennis Smallwood, Ph.D.  
Joel Sobel, Ph.D.  
Laurence Weiss, Ph.D.

### Assistant Professors:

Richard Carson, Ph.D.  
Graciela Kaminsky, Ph.D.  
Emily Lawrance, Ph.D.  
Alfredo Pereira, Ph.D.  
Robyn Phillips, Ph.D.  
Garey Ramey, Ph.D.  
Valerie Ramey, Ph.D.  
James Rauch, Ph.D.  
Lakshmi Raut, Ph.D.  
Maxwell Stinchcombe, Ph.D.  
Glenn Sueyoshi, Ph.D.

### Adjunct Professor:

Joseph Grunwald, Ph.D.

Economics is the study of how individuals, organizations, and societies deal with scarcity — the problem that available resources are not sufficient to satisfy everyone's wants. Because scarcity requires choice among alternative uses of resources, economics involves both study of the technology by which resources are turned into the things people want and study of the preferences through which people choose among alternatives. Further, since society is composed of many individuals and groups, economics involves study of the institutions through which a society can gain the advantages of cooperation and resolve the conflicts due to competing goals.

## The Undergraduate Program

### Lower-Division Courses

The department offers two introductory sequences, Economics 1A-1B-1C and Economics 2A-2B-2C. For each sequence, the A-course is an introductory microeconomics course; the B-course is an introductory macroeconomics course; and the C-course is an applications course which uses the analytical tools introduced in the A and B courses. The 1A-1B-1C courses differ from the 2A-2B-2C courses only in the fact that the latter use calculus in the presentation. Mathematics 1A-1B-1C or better is the prerequisite for enrollment in Economics 2A, 2B, or 2C.

A micro-macro combination (such as 1A-1B), or the equivalent from another institution, is required for upper-division work in economics. (The one exception is the upper-division accounting course, Economics 173, for which the single prerequisite is Economics 4.) Though a micro-macro combination is an acceptable introductory package for upper-division work, students typically will benefit from completion of a three-quarter introductory package (such as 1A-1B-1C). The applications course (1C in the 1A-1B-1C package) gives a broad overview of what is done in economics and thus provides a useful perspective from which to begin upper-division work.

A new rule is currently under discussion in the department to require, rather than merely recommend, the C course (1C or 2C) for upper-division work. If adopted, the new rule will apply to all new economics students.

A student who completes upper-division work with only a micro-macro combination (such as 1A-1B) is not allowed to pick up the lower-division applications course later; credit will not be given.

Modern economics is mathematical, and calculus is a standard working tool. Therefore, there are educational advantages in taking the calculus track of the lower-division courses (2A-2B-2C rather than 1A-1B-1C). Students planning an economics major or a quantitative economics and decision sciences major, especially the latter, are advised to take the calculus track. However, students without calculus or students who have trouble scheduling the calculus track may be reassured by the fact that the economic substance of a micro, macro, or applications course is the same in the calculus as in the non-calculus track.

For this reason, it is acceptable to mix courses from the calculus and non-calculus tracks. For examples, 1A-1B-2C and 2A-1B-2C are acceptable combinations. For the same reason, a student should not take and will not receive credit for both 1A and 2A, or both 1B and 2B, or both 1C and 2C.

The micro and macro courses may be taken in either order, or simultaneously; but both a micro and a macro course must be completed before an applications course. Thus, the three acceptable time sequences are A-B-C, B-A-C, and AB simultaneously followed by C.

The department also offers an introductory accounting course, Economics 4. It has no prerequisite, and it is a prerequisite

only for the upper-division accounting course, Economics 173. The accounting courses are required for a quantitative economics and decision sciences major; they can be used as optional parts of an economics major or minor; and they are open to students who take no other courses from the department.

### Information on Majors and Minors

A student considering a department major or minor should get a copy of the department's undergraduate brochure and should read it cover to cover. Students are expected to know, and will be held responsible for, all information in the brochure. It is more detailed than the catalog material you are reading. Copies of the brochure are available at the department office.

### Entry to the Majors

At the time this catalog copy is being written (December 1986), there are no restrictions on entry to the department's two majors. However, entry restrictions are under discussion and may be in place by September 1987. To find out, get a copy of the department's undergraduate brochure at the department office.

### The Economics Major

The economics major is designed to provide a broad understanding of modern economics. Both the tools of economic analysis and their application to contemporary problems are stressed. A student majoring in economics must meet the following requirements.

1. Calculus. Mathematics 1A-1B-1C, or Mathematics 2A-2B-2C, or the equivalent.
2. Lower-division economics. Economics 1A-1B, or 2A-2B, or 1A-2B, or 2A-1B. In addition, an applications course, either Economics 1C or 2C, is recommended.
3. Upper-division core. Economics 100A-B (microeconomics), Economics 110A-B (macroeconomics), and Economics 120A-B (statistics).
4. Upper-division electives. Six more economics courses at the upper-division level.

Majors are strongly encouraged to complete the lower-division requirements (1 and 2) before beginning the upper-division requirements (3 and 4). Further, majors are strongly encouraged to take Economics 100A-B and either 110A-B or 120A-B prior to the senior year, since nu-

merous upper-division electives have core-course prerequisites.

The following schedule, though not the only possibility, is a well-constructed one for majoring in economics.

| Fall                                | Winter                              | Spring               |
|-------------------------------------|-------------------------------------|----------------------|
| <b>Freshman Year</b>                |                                     |                      |
| Math. 1A or 2A                      | Math. 1B or 2B                      | Math. 1C or 2C       |
| <b>Sophomore Year</b>               |                                     |                      |
| Econ. 1A,<br>1B, or 2A              | Econ. 1B,<br>1A, or 2B              | Econ. 1C or 2C       |
| <b>Junior Year</b>                  |                                     |                      |
| Econ. 100A<br>Econ. 110A or<br>120A | Econ. 100B<br>Econ. 110B or<br>120B | Elective<br>Elective |
| <b>Senior Year</b>                  |                                     |                      |
| Econ. 110A or<br>120A<br>Elective   | Econ. 110B or<br>120B<br>Elective   | Elective<br>Elective |

### The Quantitative Economics and Decision Sciences Major

The quantitative economics and decision sciences major, hereafter referred to as the "QEDS major," is a variant of an economics major. Relative to the standard economics major described above, the QEDS major places less emphasis on macroeconomics and more emphasis on microeconomics. Within microeconomics, it places more emphasis on the theory of the firm and less on the theory of the household. It also places greater emphasis on the mathematical and statistical tools through which microeconomic decisions can be made.

Prior to this year, the QEDS major was called the "management science major." Though the name has changed, there have been no changes in requirements or courses. The name was changed because many students thought "management science major" to be roughly synonymous with "business major." In fact, the major has little in common with a business major. The name change alleviates this confusion.

A student majoring in QEDS must meet the following requirements.

1. Calculus and linear algebra. Mathematics 2A-2B-2C and Mathematics 2E (or 2EA).
2. Computer programming. One of the following: AMES 10, EECS 62A, EECS 65, Math. 71, Math. 77, Biol. 50.
3. Lower-division economics. Economics 2A-2B (introductory economics) and Economics 4 (introductory accounting). Economics 1A may be substituted for 2A, or 1B for 2B. However, 2A-B is recommended.

4. Upper-division core. Economics 170A-B (managerial microeconomics), Economics 120A-120B-171 (econometrics and decision theory), Economics 172A-B-C (operations research), and Economics 173 (accounting).

5. Upper-division electives. Six upper-division economics courses. Two of the six must be from the group Economics 175, 176, 177, 178, and 179.

The following schedule, though not the only possibility, is a well-constructed one for a student majoring in QEDS.

| Fall                                   | Winter                                 | Spring                               |
|--|--|--------------------------------------|
| <b>Freshman Year</b>                   |  |                                      |
| Math. 2A                               | Math. 2B                               | Math. 2C                             |
| <b>Sophomore Year</b>                  |  |                                      |
| Econ. 2A<br>Math. 2E                   | Econ. 2B                               | Econ. 4<br>Comp. Prog.               |
| <b>Junior Year</b>                     |  |                                      |
| Econ. 170A<br>Econ. 120A<br>Econ. 172A | Econ. 170B<br>Econ. 120B<br>Econ. 172B | Econ. 173<br>Econ. 171<br>Econ. 172C |
| <b>Senior Year</b>                     |  |                                      |
| Elective<br>Elective                   | Elective<br>Elective                   | Elective<br>Elective                 |

### Minors and Programs of Concentration

The economics minor consists of six courses: an introductory microeconomics course (Economics 1A or 2A); an introductory macroeconomics course (Economics 1B or 2B); and four more economics courses. These four must include at least three upper-division courses, but the four are otherwise not restricted.

Prior to this year, the department had two other minors, the management science minor and the business economics minor. Though these minors no longer exist, the substantive educational opportunities still do. Any set of courses which would have qualified as a management science minor or as a business economics minor will qualify as a straight economics minor.

Regarding Warren College programs of concentration, students should see Warren academic advisers.

### Honors

For departmental honors, a student must satisfy (a) and (b).

- (a) The student must either complete a QEDS major or complete the honors track of the economics major. The honors track of the economics major consists of the regular economics major plus one advanced microeconomics course (such as Economics 105), one advanced macroeconomics

## ECONOMICS

course (such as Economics 111), and one advanced econometrics course (such as Economics 120C).

- (b) The student must have a GPA in upper-division major courses which equals or exceeds a specified cut-off. The cut-off for a given year will be the maximum of (1) 3.5 and (2) that cut-off value needed to limit the number of honors students to 20 percent of all departmental majors graduating in the year.

A student qualifying for departmental honors will have the phrase "with distinction" printed on the diploma.

### Grade Rules for Majors

All courses used in meeting requirements for an economics or a QEDS major must be taken on a letter grade basis, with two exceptions. First, courses for which P/NP grading is mandatory (such as Economics 195 and 199) may, of course, be taken P/NP. However, no more than twelve units taken P/NP may be counted toward a major. Second, *lower-division courses* taken P/NP prior to winter 1985 may be counted toward the major (thus allowing for the fact that the lower-division rule has been changed).

Regarding acceptable grades in the major, there is an old rule, which was in effect until fall 1984, and a new rule. They are described below. A student who took a UCSD economics course prior to fall 1984 may choose to be covered under either the old rule or the new rule. Any other student must adhere to the new rule.

**Old rule.** A 2.0 or better grade-point average in upper-division economics courses is required for graduation. So long as this GPA requirement is met, courses with a D grade will be accepted. The GPA is to include elective courses taken in excess of the minimum number required.

**New rule.** All letter-graded courses offered in fulfillment of major requirements must be passed with a grade of C- (C minus) or better. This rule applies to lower- as well as upper-division courses, and it applies to courses taken from other departments. It does not apply to courses taken in excess of those needed to satisfy requirements (for example, an *extra* elective with a D grade would not conflict with the rule).

### The Graduate Program

The department offers the M.A., C. Phil., and Ph.D. degrees. However, a student must be admitted to the Ph.D. pro-

gram in order to be eligible for an M.A. or C.Phil. The main Ph.D. requirements are that a student qualify in microeconomics, macroeconomics, econometrics and one advanced field, and that a student prepare an acceptable dissertation. A detailed description of the Ph.D. program is available by writing the director of graduate studies, care of the Department of Economics. Residence and other campus-wide regulations are described in the graduate studies section of this catalog.

## Courses

### Lower Division

#### 1A-B-C. Elements of Economics (4-4-4)

The objectives of this survey course are to prepare students for a major or minor in economics, and to give those who will not specialize in economics an understanding of how the economy functions. Elementary theories of resource allocation and income determination are used to analyze policy issues of major significance. 1A is *not* required for 1B, but both A and B are required for 1C.

#### 2A-B-C. Introduction to Economic Analysis (4-4-4)

The content of this course is virtually the same as that of the 1 sequence, but mathematical methods of analysis are stressed. 2A is *not* required for 2B, but both A and B are required for 2C. *Prerequisite:* Math. 1C.

#### 4. Accounting Principles (4)

Recording, organizing, and communicating economic information relating to business entities.

### Upper Division

#### 100A-B. Microeconomics (4-4)

Household and firm behavior as the foundations of demand and supply. Market structure and performance, income distribution, and welfare economics. Credit not allowed for both Econ. 100A-B and Econ. 170A-B. *Prerequisites:* one introductory microeconomics course, one introductory macroeconomics course, and Math. 1C.

#### 101. International Trade (4)

Analysis of the causes and patterns of international trade and investment, of the scope for increasing national welfare through foreign trade and investment, and of the policies for realizing those gains and for distributing them internationally. *Prerequisite:* Econ. 100B or 170B.

#### 103. International Monetary Relations (4)

Balance of payments, international capital movements, and foreign exchange examined in light of current theories, policies, and problems. *Prerequisites:* Econ. 110B.

#### 105. Industry Organization and Public Policy (4)

Study of the structure and performance of American industry. Dimensions and determinants of market structure and performance, empirical evidence. Anti-trust laws, regulation of industry, and other aspects of public policy toward industry. *Prerequisite:* Econ. 100B or 170B.

#### 109. Game Theory (4)

Introduction to game theory. Applications to such topics as oligopoly, bargaining, contracts, and market interactions. *Prerequisites:* Math. 2C and either Econ. 100B or Econ. 170B.

#### 110A-B. Macroeconomics (4-4)

The theory of national income determination as the basis for explaining fluctuations in income, employment, and the price level. Use of monetary and fiscal policy to stabilize the economy. *Prerequisites:* one introductory microeconomics course, one introductory macroeconomics course, and Math. 1C.

#### 111. Financial Institutions and Monetary Policy (4)

A study of the financial structure of the United States economy including analysis of bank behavior and the techniques of central bank monetary control. *Prerequisite:* Econ. 110B.

#### 112. Advanced Monetary Economics (4)

Following on from Econ. 111, which is largely concerned with description of the main financial institutions, this course will consider actual monetary policy decisions and their effectiveness, both from a theoretical and empirical standpoint. *Prerequisite:* Econ. 111.

#### 113. Mathematical Economics (4)

Mathematical concepts and techniques used in advanced economic analysis; applications to selected aspects of economic theory. *Prerequisites:* Econ. 100B or 170B, and Math. 2C.

#### 115. The Evolution of Economic Theory and Policy (4)

An examination of the evolution of economic theory and policy in Western Europe and Great Britain during the eighteenth and nineteenth centuries. While attention is given to the works of such individuals as A. Smith, D. Ricardo, T. R. Malthus, J. S. Mill, K. Marx, J. E. Cairnes, and others, the primary emphasis is on the development of economic analysis as a response to the economic problems of the times. *Prerequisites:* one introductory microeconomics course and one introductory macroeconomics course.

#### 116. Economic Development (4)

Analysis of current economic problems of less-developed areas and conditions for increasing their income, employment, and welfare; case studies of specific less-developed countries. *Prerequisite:* one introductory microeconomics course and one introductory macroeconomics course.

#### 117. Economic Growth: Problems and Prospects (4)

Problems of economic growth in modern developed economies, with emphasis on population growth, environmental degradation, and resource conservation. *Prerequisites:* one introductory microeconomics course, one introductory macroeconomics course, and Math. 1C.

#### 118A-B. Law and Economics (4-4)

Analysis of the economic effects of the structure of the law with particular emphasis on the law of liability, including liability for nuisances, zoning law, products liability, and accident liability. *Prerequisites:* for 118A, one introductory microeconomics course and one introductory macroeconomics course; for 118B, 118A and consent of instructor.

#### 120A-B-C. Statistical Methods in Economics (4-4-4)

Statistical methods of special application to economic problems, and statistical problems commonly encountered in confronting economic models with nonexperimental data. Correlation and regression analysis with applications to time-series and cross-section data: estimation of simultaneous equations models. Credit not allowed for both Econ. 120A and Math. 183. Also, see the "Note on overlaps" at the end of the undergraduate course descriptions. *Prerequisites:* one introductory microeconomics course, one introductory macroeconomics course, and Math. 1C.

#### 130. Public Policy (4)

The application of macroeconomic and microeconomic theory to issues of public policy and the contributions of related disciplines, e.g., political science, sociology, education, history to the solution of these problems. (The student will be required to study one problem intensively.) *Prerequisites:* one introductory microeconomics course and one introductory macroeconomics course.

#### 131. Economics of the Environment (4)

Analysis of the causes of pollution (air, noise, water) and non-optimal utilization of certain resources (e.g., fisheries, wilderness areas, air) and of public policies to deal with these problems. *Prerequisites:* one introductory microeconomics course and one introductory macroeconomics course.

#### 133. Housing Policy (4)

(Same as USP 123.)

Examines current issues in housing policy: housing finance, rent control, neighborhood decline and revitalization, gentrification and displacement, home ownership affordability, condominium conversion, segregation and discrimination, and low-income housing. *Prerequisites:* one introductory microeconomics course and one introductory macroeconomics course.

#### 134. Regional Economics (4)

Location theory; agglomeration economies and diseconomies; transportation; migration; regional modelling. *Prerequisites:* Econ. 100B or 170B and 120B.



**135. Urban Economic Problems (4)**

(Same as USP 102.)

Analysis of causes of congestion, pollution, housing discrimination and segregation, crime, etc., and of public policies to deal with these problems. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**136. Human Resources (4)**

Theoretical and empirical analysis of public and private investment in people, emphasizing the contribution to productivity of education. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**138. Economics of Health (4)**

The application of economic analysis to the health field; the role of health in income, production, and poverty; supply, demand, and price determination in the public and private health sectors. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**139. Labor Economics (4)**

A study of labor markets including such topics as collective bargaining, evolution and impact of unions, labor force participation, labor mobility, the effects of technological change on unemployment. The implications for public policy will be given extended consideration. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**143. Applied Econometrics (4)**

Application of econometric tools to such areas as labor supply, fertility, consumption, production, investment, and money demand. *Prerequisite: Econ. 120A-B.*

**150. Economics of the Public Sector: Taxation (4)**

An analysis of the effects of government taxation on resource allocation and the distribution of income. The efficiency and equity of alternative forms of taxation. Optimal tax policies. Income redistribution through the fiscal process. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

**151. Economics of the Public Sector: Expenditures (4)**

An analysis of the effects of government expenditure policies on resource allocation and the distribution of income. Political and economic determinants of optimal public expenditure and investment policies. An introduction to cost-benefit analysis. *Prerequisite: Econ. 100B or 170B.*

**155. Economics of Voting and Public Choice (4)**

An economic analysis of social decision making, including such topics as the desirable scope and size of the public sector, the efficiency of collective decision-making procedures, voting theory and collective vs. market resource allocation. *Prerequisite: Econ. 100B or 170B.*

**160. Economic Planning (4)**

An examination of the theory and practice of economic planning in a number of European countries. Included are central planning in the Soviet Union, decentralized socialist planning in Yugoslavia, indicative planning in France, and macro planning in the Netherlands. *Prerequisite: Econ. 100B or 170B.*

**170A-B. Managerial Economics (4-4)**

Microeconomic theory, with special reference to costs and production and the theory of the firm; some applications. Demand analysis and forecasting, costs and production, business conditions analysis, price and other marketing variables, financial analysis. Credit not allowed for both Econ. 100A-B and Econ. 170A-B. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, and Math. 2C.*

**171. Statistical Decision Theory (4)**

Unified approach to decision making under uncertainty. Topics include expected utility theory, risk assessment, the value of information, bidding procedures, sampling, and optimal experiment design. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, Econ. 120A-B, and Math. 2E or 2EA.*

**172A-B-C. Introduction to Operations Research (4-4-4)**

Deterministic and stochastic optimization techniques. Linear programming sensitivity, duality; integer programming; network models and related algorithms. Kuhn-Tucker theory, nonlinear programming algorithms. Dynamic programming in deterministic and stochastic contexts, queuing and inven-

tory systems and related problems. A student may not receive credit for both Economics 172A-172B and Mathematics 171A-171B. Also, see the "Note on overlaps" at the end of the undergraduate course descriptions. *Prerequisites: Math. 2E or 2EA, one introductory microeconomics course, and one introductory macroeconomics course. Econ. 120B is required for 172C.*

**173. Managerial Accounting (4)**

The structure of accounting systems, their underlying assumptions, and their use by management. Basic techniques for recording, summarizing, and evaluating organizational activity; the income statement and balance sheet. Cost accounting and use of accounting for internal control and decision making. *Prerequisite: Econ. 4.*

**175. Financial Management (4)**

Analysis and management of the flow of funds through an enterprise; functions and operations of money and capital markets, management of short-term assets and liabilities, raising long-term funds, selection of investment projects, and determination of the cost of capital. *Prerequisite: Econ. 120A.*

**176. Marketing Management (4)**

The role of marketing in the economy and the functioning of markets. Operational models of buyer behavior, and techniques for demand analysis and sales forecasting. Managerial decisions relating to the marketing mix, promotion, product selection, pricing, and distribution. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, Econ. 120B, and EECS 61.*

**177. Operations Management (4)**

Principles and techniques relevant to problems of effective resource use faced by operating managers. Topics include project planning and control, facility design and scheduling, quality control, maintenance policies, and the function and management of inventories. *Prerequisites: Econ. 120A and Econ. 172A.*

**178. Management Science: Business Forecasting (4)**

An examination and evaluation of quantitative forecasting techniques in business and economics. These techniques are applied to demand and price changes, introduction of new products, inventory levels, demographic projections, and other areas in business and economics. *Prerequisite: Econ. 120B.*

**179. Management in the Public Sector (4)**

Problems in evaluating the consequences of government actions; applications of cost-benefit and cost-effectiveness analysis, budgeting systems. Problems involved in the management of nonprofit enterprises, approaches to their solution. *Prerequisite: Econ. 170B or 100B.*

**195A-B-C. Introduction to Teaching Economics (4-4-4)**

Introduction to teaching economics. Each student will be responsible for a class section in one of the lower-division economics courses. Limited to advanced economics majors with at least a 3.5 GPA in upper-division economics work. (P/NP grades only.) *Prerequisite: consent of the department.*

**197. Field Studies (4)**

Individually arranged field studies designed to augment the student's academic training with practical experience outside the university. By special arrangement with a Department of Economics faculty member. (P/NP grades only.) *Prerequisites: consent of instructor and department approval.*

**199. Independent Study (2 or 4)**

Independent reading or research under the direction of and by special arrangement with a Department of Economics faculty member. (P/NP grades only.) *Prerequisites: consent of instructor and departmental approval.*

**Note on overlaps:** In general, a student may be denied credit for taking the same subject matter in more than one course, even if there is no explicit mention of the overlap issue in the course descriptions. In particular, the subject matter of Econ. 120A-B overlaps the subject matter of probability and statistics courses offered in other departments (Math. 180A-181A, for example); and the subject matter of Econ. 172A-B-C overlaps the subject matter of Math. 171A-B and AMES 146A-B-C. It is a student's responsibility to find out, by conferring with relevant advisers, what course combinations are advisable and when credit will be denied.

**Graduate****200A-B-C-D-E-F. Microeconomics (4-4-4-4-4)**

Background mathematical techniques, static and intertemporal consumer and producer theory, partial and general equilibrium, modern producer and consumer theory, risk, time, and interdependence, modern welfare economics.

**201A-B. Advanced Economic Theory (4-4)**

An intensive examination of the literature on selected topics of current importance in economic theory. *Prerequisites: Econ. 200F and 210D or consent of instructor.*

**202A-B-C. Workshop in Economic Theory (0-4/0-4/0-4)**

An examination of recent research in economic theory, including topics in general equilibrium, welfare economics, duality, and social choice; development of related research topics by both graduate students and faculty. (S/U grades only.) *Prerequisite: Econ. 200F or consent of instructor.*

**210A-B-C-D. Macroeconomics (4-4-4-4)**

Neoclassical and Keynesian theories of employment, income, interest rate, price level, and other aggregate variables; macroeconomic policy; balance of payments and exchange rates; conflicts between external and internal balance; disequilibrium theory; growth theory.

**211A-B. Fiscal and Monetary Theory and Policy (4-4)**

Macroeconomic models and empirical studies emphasizing the monetary and government sectors, the interaction of fiscal and monetary policies, and their relative impact on aggregate output and the price level, microeconomic foundations of aggregate asset demand and supply, regulation of financial institutions. *Prerequisite: Econ. 210D or consent of instructor.*

**212A-B-C. Workshops in Applied Regional and Macroeconomics (0-4/0-4/0-4)**

An examination of recent research in empirical macroeconomic and regional economic models, utilizing both structural economic and time-series methods; development of related research topics by both graduate students and faculty. (S/U grades only.) *Prerequisite: Econ. 210D.*

**214A-B. Finance (4-4)**

Theoretical and empirical issues in finance.

**220A-B-C-D-E-F-G. Econometrics (4-4-4-4-4-4-4)**

The construction and application of stochastic models in economics. This includes both single and simultaneous equations models. Matrix algebra and basic statistics are covered. Also covered (in 220F and G) are empirical applications to micro and macroeconomics. These require the completion of an empirical project. Both 220E and F will be offered simultaneously in the winter quarter.

**221A-B. Advanced Econometrics (4-4)**

Extensions of the theory of the linear model; Bayesian analysis; principal components, discriminant analysis, spectral analysis of time series; insufficient data problems and the use of generalized inverse matrices; experimental design; formulation and evaluation of economic models, including the interpretation and testing of causality. *Prerequisite: Econ. 220G or consent of instructor.*

**222A-B-C. Workshop in Econometrics (4-4-4)**

Examination of recent econometric research; development of own research by students and faculty.

**230A-B. Public Economics (4-4)**

Impact of the government sector via expenditure and tax policies on resource allocation and income distribution; public goods; theory and applications of benefit-cost analysis; theory of social choice; efficiency and distributional effects of tax policies. *Prerequisite: consent of instructor.*

**232A-B-C. International Trade (4-4-4)**

Theory of international trade, finance, and monetary relations. Growth, disturbances, capital movements, and balance of payments adjustment. International economic policy and welfare. *Prerequisite: consent of instructor.*

**234A-B. Industrial Organization (4-4)**

Noncompetitive market structures and their effects on firm behavior and resource allocation. Measurement of monopoly power and its change over time. Antitrust policy. *Prerequisite: Econ. 220G or consent of instructor.*



## EDUCATION ABROAD PROGRAM

### **235A-B-C. Workshop in Applied Microeconomics and Industrial Organization (0-4/0-4/0-4)**

An examination of recent research in applied microeconomics with emphasis on market structure, industrial organization and regulation; development of related research topics by both graduate students and faculty. (S/U grades only.)

### **236A-B. Human Resource Economics (4-4)**

Human capital formation and education; income distribution and poverty; the economics of health, the medical sector, and the role of insurance. *Prerequisite: consent of instructor.*

### **238A-B. Urban and Regional Economics (4-4)**

Urban models based on location theory will be used to investigate the structure of cities and patterns of land use. The models will be expanded to cover housing, discrimination, urban renewal, transportation planning, and empirical urban modeling efforts. Regional income determination will be discussed from an analytical viewpoint emphasizing both demand and comparative advantage. Factor migration, agglomeration economics, returns to scale, externalities of congestion and pollution, local public finance and empirical regional models will be discussed. *Prerequisite: consent of instructor.*

### **240A-B. Economic Development (4-4)**

Problems of growth in less developed countries. Classical and neoclassical growth theory; interactions of agriculture and industry; employment, income distribution, and population growth; project evaluation and central planning; the new international economic order.

### **242A-B. Economics of Natural Resources (4-4)**

Selected topics in the economic theory of exhaustible and renewable resources; competitive theory of mineral supply; aggregative econometric supply models; microsimulation supply models; leasing policy and bidding theory; econometric models of energy demand; and long-run growth models with resources.

### **267. Special Topics in Economics (4)**

A lecture course at an advanced level on a special topic (or set of related topics) in economics. May be repeated for credit, if topic differs. *Prerequisites: Econ. 200G, 210D, and 220G, or consent of instructor.*

### **269. Seminar in Economics (4)**

A program of regular reports by graduate students on their own research, usually dissertation research. Faculty and visitors are encouraged to participate, both to act as critics and to report on their research. May be repeated for credit. (S/U grades only.)

### **271. Directed Reading (4)**

The interim adviser will supply the student with a reading list in the student's advanced field. To receive a passing grade in this course the student must display satisfactory knowledge (in terms of breadth and depth) of his or her advanced field as demonstrated by (1) weekly discussions with the interim adviser, and (2) written examination or written critical reports on a number of papers.

### **272. Third-Year Literature Review Paper**

Drawing upon the directed reading of 271, each student must complete a third-year literature review paper. This paper must contain an up-to-date critical literature survey of some subfield of the student's advanced field, a discussion of the problems outstanding in this subfield, and a feasible proposal for a research project on at least one of these problems.

### **273. Third-Year Literature Review Presentation (4)**

Each student must present the essential contents of his or her third-year literature review paper in a scheduled workshop. Although this presentation may be made before the paper is complete, it must cover essentially the same topics as the paper (i.e., literature survey, discussion of problems, and research proposal). Students are responsible for scheduling their own presentation and are advised to sign up for a scheduled time early in the term.

### **274. Third-Year Original Paper (4)**

Each student must complete a paper consisting of original research in a topic discussed with and approved by the interim adviser. Previously written original papers may be used as the basis for this paper if approved. However, since the standards will be higher than, say, for second-year empirical papers, substantial improvement will be expected in such cases.

### **275. Third-Year Original Presentation (4)**

Each student must present the essential contents of his or her third-year original paper in a scheduled workshop. Although this presentation may be made before the paper is complete, it must consist of an essentially complete discussion of the topic and results of the paper. Students are responsible for scheduling their own presentations and are advised to sign up for a scheduled time early in the term.

### **276. Fourth-Year Original Paper (4)**

Each student must complete a paper consisting of original research in a topic discussed with and approved by the interim adviser. It is hoped that this paper will form the basis for a successful thesis.

### **277. Fourth-Year Original Presentation**

Each student must present the essential contents of his or her fourth-year original paper in a scheduled workshop. Although this presentation may be made before the paper is complete, it must consist of an essentially complete discussion of the topics and results of the paper.

### **280A-B-C. Computation (1-1-1)**

Introduction to computer programming and software use. Applications taken from other core sequences.

### **290A-B-C. Colloquium in Economics (0-0-0)**

Lectures presented by visiting speakers and resident faculty on research in a variety of topics in both theoretical and applied economics. (S/U grades only.)

### **291. Advanced Field Advising (4)**

Controlled reading and discussion with adviser; literature survey. May be repeated for credit.

### **297. Independent Study (1-5)**

(S/U grades only.)

### **299. Research in Economics for Dissertation (1-9)**

(S/U grades only.)

### **500A-B-C. Teaching Methods in Economics (4-4-4)**

The study and development of effective pedagogical materials and techniques in economics. Students who hold appointments as teaching assistants must enroll in this course, but it is open to other students as well. (S/U grades only.)

established in Paris. Most programs are for a single academic year, except for Hungary, the Study and Field Experience Program in Mexico, and Togo, and the USSR. The students who participate in the EAP earn UC academic credit and are eligible for financial aid and several scholarships. Other non-EAP study abroad opportunities at UCSD are described at the end of this section.

## Purpose

The Education Abroad Program was originally designed to give mature, highly motivated, and academically successful upper-division students from all UC campuses rich experience in a new cultural milieu as a part of their normal undergraduate program. Somewhat later, a graduate dimension was added which has now made significant contribution in assisting a small number of selected students in their programs toward advanced degrees.

The program stimulates the intellectual development of the participants, broadening the general education of all, and giving a new depth to the particular academic interests of some. Most gain fluency in a language other than their own, and all grow in their ability to engage in independent study. Perhaps most valuable of all are increased self-understanding, clarified life purposes, and a broadening and deepening of personal values.

One of the most distinctive features of the program is the emphasis placed on the full integration of the UC students into the life of the host university. For the most part, UC students abroad live as do the students of the host university, attend the same classes, take courses from the same professors, and take part in local social and cultural activities. As an aid in facilitating UC student adjustment to unfamiliar educational practices, tutorials are included within the curriculum of most of the study centers, supplementing the regular academic offerings of the host university.

## The Academic Program

The academic program of each student includes: (1) a preparatory course in the language of the country (where university instruction is not in English); (2) a full academic year of credit courses (with a few exceptions); and (3) a wide-ranging opportunity to audit courses, either in the student's special field of interest or in new fields.

## EDUCATION ABROAD PROGRAM

OFFICE: International Center, (corner of Hutchison Way and Gilman Drive)

David R. Ringrose, Ph.D., History  
(Faculty Coordinator)

Mary Dhooge, Dean of International Education

Molly Ann McCarren, Adviser, Education Abroad

Administered by the University of California, the Education Abroad Program (EAP) is now entering its twenty-fifth year of operation. Study Centers have been established in Australia, Austria, Brazil, China, Costa Rica, Egypt, France, Germany, Hong Kong, Hungary, India, Israel, Italy, Japan, Kenya, Korea, Mexico, New Zealand, Norway, Peru, Portugal, Spain, Sweden, Taiwan, the United Kingdom and Ireland, the USSR (Leningrad), and West Africa (Sierra Leone and Togo). A special program for students interested in film, as well as a program for qualified students in history and social science have been es-

In order to assist students to adjust to different academic requirements of the host university and to provide a link to American university practices, many courses taken by UC students are supplemented by tutorials. The tutorials are conducted by graduate students or junior staff of the host university, who help UC students to resolve language difficulties, provide cultural background presupposed by the lectures, give opportunities for questioning and discussion, and supplement the lectures by reading assignments, papers, and evaluation of progress.

Each student is concurrently enrolled on the home campus of the University of California and at the host university. Full academic credit is received for courses satisfactorily completed. The selection of courses is such that, by advance planning and wise choice, most students can make normal progress toward graduation. Some students fulfill some general-education requirements.

## STUDY CENTERS

At any one center, the courses and fields of study open to UC students may be limited. Moreover, each of the host institutions has special areas of excellence and strength. The listing of centers below incorporates selected information concerning these points. More detailed information is available in the flyers describing each of the centers and from the Education Abroad Program counselor in the International Center. Interested students may also discuss the program with academic advisers in their respective provost office and with faculty/EAP advisers in each academic department.

### Europe

**Austria.** The program is small and is designed to offer an opportunity to pursue a specialized interest in the areas described below. A compulsory intensive language course at Georg-August University in Göttingen, Germany, precedes the beginning of the academic year. All courses are taught in German.

**University of Vienna.** Eastern European studies (Balkans, Soviet Union), fine arts (history of art, music, theatre arts), folklore, history.

**France.** A compulsory intensive language course precedes the beginning of the academic year. All courses in the universities are taught in French. Customarily, tutorials accompany certain courses in which several UC students are enrolled.

UC faculty directors are in residence at Bordeaux, Grenoble, Montpellier, and Paris.

**University of Bordeaux.** Broad areas of physics, and mathematics. The Institute of Political Science and the Institute of Prehistory (Anthropology) are well known.

**University of Grenoble.** Mainly in the social sciences through the Université des Sciences Sociales (Grenoble II), some humanities, mathematics, and computer science. Offerings in anthropology, psychology, and history are severely limited. Not suitable for life and physical sciences.

**University of Lyon.** Humanities and social science. There is also an Institute of Political Science.

**University of Marseille.** Biological sciences and environmental marine biology. The Marseille program is open only to students in the biological sciences.

**University of Montpellier.** Humanities and literature, primarily through Paul Valéry University.

**University of Paris.** Major emphasis in film and contemporary criticism and culture; programs in history and social science.

**Pau-Paris.** The participants spend the first semester at the University of Pau and then, at the end of January, move to Paris to study at the University of the New Sorbonne (Paris III). In addition to required core courses in French history and civilization, students are able to take courses in humanities and social sciences, with emphasis on comparative cultural studies, and French civilization and language.

**University of Poitiers.** Humanities, with major emphasis in history and medieval studies, mathematics, physics.

**Germany.** A compulsory intensive language program precedes the beginning of the academic year. All courses are taught in German. Tutorials supplement courses in which several UC students are enrolled.

**Georg-August University, Göttingen.** Broad curriculum covering most majors. Excellent science programs, with substantial strength in biology, chemistry, physics, and mathematics. Space in laboratory courses in biology and psychology may be limited. Science majors may be restricted to theory courses.

**Hungary.** A fall quarter program at Karl Marx University in Budapest. Instruction is in English and includes courses in Central European history, culture, economics and economic history. One course is in conversational Hungarian.

**Italy.** A compulsory intensive program

in language and contemporary Italian history at the University of Padua precedes the beginning of the academic year. Students who have completed only one year of Italian are eligible for participation in the EAP in Italy, but if selected, must complete the equivalent of the second year prior to the start of the language program in Padua. They must get the second year of Italian by attending the "pre" Intensive Language Program offered during the summer in Italy. A UC faculty director residing in Padua administers all EAP programs in Italy. All courses are taught in Italian.

**University of Padua.** History of art (including linguistics), and political science (which includes history, social sciences, geography and demography, as well as political science in the American sense). Sciences are not available for UC students.

**University of Venice.** Humanities and social science. Faculties of business, economics, literature, and industrial chemistry are renowned.

**Conservatorio di Musica C.B. Martini, Bologna.** Individual instruction in music performance, composition, music history. An audition is required for admission.

**Accademia delle Belle Arti di Venezia, Venice.** Art studio and some history. Color slides of portfolio of artistic work must be submitted for admission.

**Cini Foundation, Venice.** Independent study projects for graduate students in Venetian art, literature, and history.

**Norway.** Knowledge of Norwegian is not required, but a compulsory intensive course in Norwegian (mid-June to mid-August) precedes the beginning of the academic year. Intensive language study is continued during the fall semester. All courses are taught in Norwegian, and tutorials can be arranged to supplement some courses.

**University of Bergen.** Humanities, social sciences, natural sciences, and mathematics are available, but space in the sciences may be limited. The usual pattern is study of a single subject, usually the major or a closely allied field, for the entire year.

**Portugal.** The academic program begins with a six-week intensive Portuguese language program at the Portuguese Language Institute at UCSB. At the University of Lisbon, UC students may take language and liberal arts classes designed for foreigners, as well as offerings within the regular university system. Language prerequisite: two years of university

## EDUCATION ABROAD PROGRAM

level Portuguese, or two years of Spanish, or one year of Portuguese with one year of Spanish.

**Spain.** A compulsory intensive language program precedes the beginning of the academic year. All instruction is in Spanish.

*University of Barcelona.* Humanities (with emphasis on Spanish art, history of Spanish institutions, Spanish and Latin American literature, and linguistics) and some social sciences. A study program consists entirely of core courses developed for the center and taught by faculty of the University of Barcelona. (This is a cooperative program with the University of Illinois.)

*University of Madrid.* Humanities and some social sciences. The core program, developed for the UC Study Center and other American programs, concentrates on Spanish studies in the broadest sense. Core and study center courses are taught by Spanish faculty.

**Sweden.** Compulsory intensive language course during the summer for students who are not already fluent in Swedish. Language study continues during the fall semester for all students until the student has gained the equivalent of two years of Swedish. Most courses are taught in Swedish, but a few courses offered in English may be available.

*University of Lund.* Broad curriculum. Excellent science programs.

**United Kingdom and Ireland.** The program, which includes fifteen institutions, is administered by a director and associate director located in London. The UK program is highly competitive, largely due to its popularity with students. After a student has been selected for participation by the EAP administration, he or she must still be accepted by a specific department in one of the host institutions. In many host institutions, the student can pursue studies in that department only. Participating institutions are:

England. *University of Birmingham, University of East Anglia, University of Exeter, University of Hull, University of Kent at Canterbury, University of Lancaster, University of Leeds, University of Sussex, Westfield College and University College (University of London), University of York.*

Ireland. *Trinity College of the University of Dublin.*

Scotland. *University of St. Andrews, University of Stirling.*

Wales. *University College of Wales,*

*Aberystwyth; St. David's University College, Lampeter.*

Generally, the host universities offer a broad curriculum that includes most liberal arts majors. Life sciences and physical sciences are available.

**USSR.** *Leningrad State University.*

The program is cooperative and involves a number of other American universities with arrangements coordinated through the Council on International Educational Exchange (CIEE). Selection is highly competitive and is conducted on a national basis through written examination, interviews in Russian, and prepared statements of purpose. Three years of Russian at the university level are a firm requirement. Enrollment is for four months in either a spring or fall semester, or for an academic year. The curriculum is limited to Russian language and civilization.

### Middle East

**Egypt.** All courses are taught in English, except courses in Arabic language and literature.

*The American University, Cairo.* A broad curriculum is offered by the faculty of arts and sciences. All students are required to take at least one course in Arabic during the year.

**Israel.** First priority is given to students who have completed at least one year of Hebrew. A compulsory language course precedes the beginning of the academic year. Study centers in Israel are administered by a UC faculty director located in Jerusalem.

*University of Haifa.* Special attention is given to contemporary Israel as reflected in Arab-Jewish studies. There is strong emphasis on the kibbutz movement. UC students enroll in a special one-year program for foreign students. Limited opportunity in the sciences.

*Hebrew University, Jerusalem.* Broad curriculum, with emphasis on Israel and Middle Eastern studies. UC students enroll in a special program for foreign students, taught in English. The program offers courses in Judaic, Israel, Middle Eastern studies, and a few courses in the general social sciences and humanities. In addition, the School for Overseas Students, in cooperation with the mathematics and science faculty, offers an extensive program in the sciences based mainly on laboratory courses. Students with adequate command of Hebrew have access to a broader curriculum throughout the Hebrew University.

### Asia

**India.** *Delhi, University of Delhi.* EAP is offering a new program at the University of Delhi. Students do special Hindi language study, enroll in some regular university classes, and take courses designed for foreigners which examine contemporary India and its traditions. The university's strengths are in history, economics, the arts, and the social sciences. Instruction is in English.

**Beijing.** *Beijing (Peking) University.*

The purpose of the academic program is to improve the student's facility in spoken and written Mandarin Chinese and to enable students to gain an insight into Chinese society and culture. Eligibility requirements are a minimum of two years of Chinese language. Undergraduates and graduate students from all disciplines are encouraged to apply.

**Nanjing.** *Nanjing University.*

This program is a cooperative with arrangements coordinated through the Council on International Educational Exchange (CIEE). Students may apply for either a fall or spring semester program. It is a language and area studies program. Minimum of one year of Chinese language required.

**Taiwan.** *National Chengchi University.*

In addition, students who want to do Mandarin studies may be placed at the National Chengchi University in Taiwan through a cooperative arrangement with the California State University System.

**Hong Kong.** A limited selection of courses is offered in English. Knowledge of Chinese is not required for acceptance, but all students are required to include eighteen units of Mandarin or Cantonese in their annual program.

*Chinese University, Hong Kong* in cooperation with the Yale-China Association. Humanities and social sciences, with emphasis on Chinese studies. Art studio and music performance courses are available. (Information about courses to be offered in English is announced only one week before instruction begins.)

**Japan.** Completion of one year of Japanese at the university level or the equivalent is required for acceptance. (A compulsory intensive language course precedes the academic year.) Students are expected to complete an additional eighteen units of Japanese language during their year in Japan. A limited number of courses taught in English is available. Their number changes from year to year.

since such courses depend on foreign visiting faculty who can teach in English.

*International Christian University, Mitaka (Tokyo).* Humanities and social sciences, with emphasis on Japanese language, literature and art, as well as a focus on problems of the Orient, economics and history of the Far East, Oriental philosophy, and political science.

*Sophia University.* Program consists of language courses and courses in English and Japanese at the Ichigaya Campus. Sophia offers a wide variety of English language courses in the humanities and social sciences.

*University of Tsukuba.* Open to graduate students only. Admission requires completion of at least two years of college-level Japanese. Major fields of graduate study are available; most UC students will be accepted in the Area Studies program.

**Korea.** Students study at Yonsei University in Seoul. The academic program includes language study and courses taught in English in the humanities and social sciences. EAP students proficient in Korean may enroll in regular university courses.

## Africa

**Sierra Leone.** *Fourah Bay College* in Freetown, Sierra Leone, offers courses in demography, economics, education, geography, history, literature, marine biology, oceanography, religious studies, and the social sciences.

**Togo.** A summer study and field experience. Eight-week (twelve unit) program of intensive French language study, and a course on contemporary Africa (in English), followed by two projects in communities outside of the capital, Lomé. No language requirements. Freshman and above may apply.

**Kenya.** Open to undergraduate and graduate students. As in the British system, students take a year-long program of study in their major or area of specialization. Examinations are given once, at the end of the academic year, and are mandatory for receiving credit.

*University of Nairobi.* Humanities and social sciences, with emphasis in African studies. Limited opportunities in the sciences and in veterinary science. Graduate students in history, political science, sociology, architecture, and design may associate with the Institute for Developmental Studies, Institute for African Studies, of the Housing and Research Development Unit.

## Latin America

**Brazil.** Language requirements for admission to this program are: two years of college-level Portuguese or the equivalent; or one year of college Spanish and one year of college Portuguese; or two years of college Spanish and completion of an intensive course in Portuguese prior to departure. Since courses are taught in Portuguese, the equivalent of one year of college-level Portuguese is the absolute minimum. A compulsory intensive language course precedes the beginning of regular course work.

*University of Sao Paulo.* Brazilian literature, Portuguese language, arts, economics, humanities, and social sciences. (This is a cooperative program with the University of Indiana.)

**Costa Rica.** There are three different programs:

*Year Program.* EAP participants study at the University of Costa Rica in San Jose. Students take regular university courses in the humanities and social sciences, with at least half of their course work related to Central America. All classes are taught in Spanish. Two years of university level Spanish required.

*Tropical Biology Program.* During spring quarter, students who meet certain biology prerequisites may study tropical biology in the rain forest of Monteverde. Previous Spanish is preferred.

*Medical Quarter.* An eight-week program for fourth-year medical students in the spring. It includes language and community and family health clinical studies at the University of Costa Rica.

**Mexico.** A compulsory intensive language program precedes the beginning of the academic year. Students usually enroll in courses offered by the School for Foreign Students. Students also take courses offered in the Facultades (regular university courses) which are of high academic quality and considerable variety.

*National Autonomous University of Mexico (UNAM), Mexico City.* Humanities, social sciences, and art practice. The School for Foreign Students offers Latin American art, literature, and history, Mexican and Central American studies, and Spanish language and literature.

### Study and Field Experience — Mexico.

In addition to the academic year program in Mexico, the EAP sponsors a quarter-long program, in spring and fall quarter, called Study and Field Experience, a variation in traditional EAP structure. The program is primarily for those

who have an interest in studying Spanish, in learning firsthand about Mexico, its people, culture, history, and political and economic structures, and who want to live abroad — but only for a few months (one quarter). The Study and Field Experience Program is designed as a general education program with an emphasis on area studies. Students receive UC credit for successfully completing the program which includes intensive language study, and a course taught in English on contemporary Mexico, which combines lectures, cultural and educational field trips, and five weeks of work experience in rural villages. Participants must have completed three quarters of Spanish by the time of participation.

**Peru.** A compulsory intensive language course precedes the beginning of the academic year. All courses are taught in Spanish.

*La Católica, Lima.* Humanities and social sciences. Anthropology, archaeology, and ethnohistory are of special interest. (This is a program of the Peru Consortium, which is composed of the University of Indiana and a number of California universities.)

## South Pacific

**Australia.** The University of California enables students to study at one of six universities in Australia: LaTrobe, Monash, and the University of Melbourne in Melbourne, the University of Sydney and Macquarie University in Sydney, the University of New South Wales, and the Australian National University in Canberra. Students may indicate a preference for the host university, but final assignment is based on a student's academic field and space availability in a given department at one of the universities. Once accepted, students are expected to concentrate on their major or closely allied field. Students of most academic disciplines can be accommodated in one of the institutions. The program in Australia commences during our winter quarter.

**New Zealand.** EAP will begin sending students to New Zealand in March 1988. At this time, agreements are being worked out with six universities.

## Academic Planning and Advising

A participant who wishes to make normal progress toward graduation should counsel *in advance* with a departmental adviser and an academic adviser in his or her college provost's office in order to as-



## EDUCATION ABROAD PROGRAM

certain how participation will affect his or her academic program. Descriptions of individual courses presently approved for UC credit may be found in the *Academic Adviser's Manual* in the International Center office, the four provosts' offices and the Central University Library on campus. Each academic department also has a designated EAP faculty adviser, who has the *Academic Adviser's Manual* with course descriptions. Since offerings at the host universities may change rapidly, the listings in the *Academic Adviser's Manual* represent some of the courses UC students have taken in the past. Many of the same or similar courses will be available in future years, but students should plan programs that are sufficiently flexible to allow them to take alternate courses. Each year new courses are added to a center's approved offerings as needed by UC students attending and as available at the host university. Although courses approved by the University of California carry full credit, each department retains the right to determine the extent to which it will accept units so earned in the fulfillment of the requirements for its own majors.

Normally, students apply for admission to the program during the fall or winter quarters of their sophomore year. For some programs in southern hemisphere regions with semesters beginning during our winter or spring quarter, selection may be made during the prior spring quarter. However, a limited number of students are accepted each year to participate as seniors and as graduate students. Such students should make inquiries of the provost of their college as well as of academic advisers in their major departments in order to learn in what ways participation will affect their status.

In order to facilitate the academic work of the students, University of California professors serve as directors and associate directors of the study centers. They work with their counterparts in the host university in developing the academic program, and advise students on any problem pertaining to their work. In addition, the directors are responsible for all aspects of student welfare and conduct.

### Selection

Participants are chosen on each campus by a faculty/student committee. Basic requirements are: junior standing in the university at the time of participation and a 3.0 GPA at the time of application. In most foreign language programs such as Austria, Brazil, China, Costa Rica, France,

Germany, Mexico, Peru, Portugal, Spain, two years of university-level work in the language of the country with a B average, or the equivalent, are required. Exceptions to this policy include Japan which requires one year of Japanese at the university level and a compulsory intensive language course preceding the academic year in Japan; Italy for which one year of Italian is required, but students must take part in a special two-month summer language program in Italy (not required if the student has had two years of university Italian); the Mexico Study Field Experience Program which is open to sophomores, juniors, and seniors, with the equivalent of three quarters of university-level Spanish. USSR requires three years of university Russian. For Hong Kong and Israel there is no language prerequisite, but prior study of Chinese and Hebrew is strongly recommended. For Norway and Sweden prior study of Norwegian and Swedish is recommended, but not required. Students must take an intensive ten-week course at the beginning of the summer in the host country. There is, of course, no language requirement for countries where instruction is in English such as Australia, Cairo, Hungary, Kenya, Korea, New Zealand, Sierra Leone, Togo, and the United Kingdom/Ireland. In addition to academic criteria for selection, the faculty committee attaches much importance to indications of the student's seriousness of purpose, maturity, and the capacity to adapt to the experience of study abroad. As part of the screening process, students are required to consult with their college academic and department advisers.

Transfer students from other colleges and universities are eligible if they have completed at least one quarter at the University of California at the time of selection.

### Student Conduct and Parental Approval

It is anticipated that the students selected for the Education Abroad Program will be of high caliber, committed to profiting from both the intellectual and social aspects of the experience. Since they will be guests in another country and another university, their conduct will reflect on both the University of California and the United States. Students participating in the Education Abroad Program are responsible to the director of the center, to the director of the EAP, to the faculty of the University of California, and to the faculty members of the host university who are

related to the program. The director of the EAP reserves the right to terminate the participation in the program of any student whose conduct (in either academic or non-academic matters), after careful consideration and full review, is judged to be contrary to the standards and regulations of the host university.

Participation in the program by students who are minors must be approved by their parents or guardians. In approving such participation, parents and guardians should be aware that a greater degree of personal freedom is afforded to students in the foreign university, and that the University of California cannot take responsibility for closely supervising the activities of individual students. The directors of the centers will be available to students with problems and will maintain close contact with the student group as a whole. The university provides for comprehensive medical and hospitalization coverage for all participants.

### Cost and Financial Aid

The regents endeavor to bring the program within the reach of all students, regardless of their financial resources. The cost of studying abroad is often comparable to the cost of studying on a UC campus. The only additional costs directly related to the program are for round-trip transportation and vacation travel, and personal expenses beyond what normally would be spent at home. In most instances, participants may take their university scholarships with them. The NDSL and Regents' loan fund are also available. Many scholarships specifically for EAP participants are available. Also in the past, funds have been provided by the U.S. Department of State and the University of California for minority and financially disadvantaged students. It is hoped that such funds will be available in the future. Costs range between \$5,200 and \$8,500 for the year programs (including tuition, room and board, round-trip transportation, books, health and accident insurance, and some travel). Prospective participants who require financial assistance should counsel early with the Financial Aid Office.

### Transportation, Housing and Applications

The Education Abroad Program arranges transportation to various study centers and will assist in finding inexpensive transportation back to the United States at a time and by a means of the student's choosing. In most study centers a



variety of housing facilities is available, including residence halls and private dwellings.

Application forms for admission to the program are available in the Education Abroad Program Office at the International Center in the Administrative Complex, UCSD, and are given to students following a discussion of various aspects of the program with the EAP counselor. Information on deadlines and related matters such as course offerings, information sessions, selection, schedules of departures and payment of fees may be obtained from the Education Abroad Program Office at the International Center, UCSD. It is not too early to begin planning for a year abroad during one's freshman year. General group information sessions about the programs are held during Welcome Week for freshmen and in October for prospective applicants.

### Other Academic Opportunities Abroad

Timothy McDaniel, Ph.D., Sociology  
(Faculty Coordinator)

Catherine Gamon, Adviser,  
Opportunities Abroad Office

Students interested in going abroad should also investigate possibilities through the Opportunities Abroad Program at the International Center, which can assist with placement in a wide range of other academic programs. In contrast to EAP participants, students going abroad through the Opportunities Abroad Program can enroll concurrently in UCSD but earn *transferable* credit from the sponsoring institution. Financial aid for approved plans of study abroad is available to students who enroll concurrently at UCSD through the Opportunities Abroad Program.

In addition to these academic programs, the office assists students in selecting a wide range of volunteer, internship, and educational travel programs.

## ELECTRICAL AND COMPUTER ENGINEERING (ECE)

See Engineering, Division of, below.

## ENGINEERING, DIVISION OF

The Division of Engineering at UCSD comprises the Departments of Applied Mechanics and Engineering Sciences (AMES), Computer Science and Engi-

neering (CSE), and Electrical and Computer Engineering (ECE). The division is directed by the dean of Engineering. The departments offer many undergraduate curricula and graduate degree programs. Students interested in engineering should consult the following departmental sections of this catalog.

Student demand exceeds program capacity in several of the undergraduate majors in each department. Each department has therefore instituted processes to screen applicants for admission. All students interested in engineering majors must consult the department of their choice and review the requirements necessary to gain admission. Remember, admission to the university, even when interest in a major is specified during the application process, is not a guarantee that one can complete a degree program in engineering.

### Pre-Engineering Majors

Until such time as they are admitted to an engineering program, students may indicate their interest in engineering by using one of the three pre-engineering major codes. Students should use the pre-engineering code of the department that contains the major that they intend to pursue, i.e., pre-AMES, pre-CSE or pre-ECE.

### Admission to the Division of Engineering

Pre-engineering students should complete the following courses during their freshman year and apply for admission to an engineering major during the spring quarter of their freshman year:

- Math. 2A, 2B, 2C
- Physics 2A, 2B
- Chemistry 6A or 7A (not required for CSE)
- Any two additional courses in science, math, engineering. One of them must be engineering.

Admission will be based on performance in these courses. While this subset of courses will be used for an admission decision, it is expected that pre-engineering students will follow the recommended curricula (given by the departments below) as much as possible, subject to their college requirements. It is expected that twelve to eighteen units of general education will also be completed in the first year.

Students who are not able to satisfy this application requirement, or who wish to reapply following denial, must apply dur-

ing their sixth quarter of study at UCSD. NO ADMISSION TO AN ENGINEERING MAJOR WILL BE CONSIDERED AFTER SIX QUARTERS OF STUDY. This sixth quarter admission review will examine the student's entire academic performance, especially weighing courses in science, math and engineering, together with a consideration of other factors such as rate of progress, quarter course load, and trends in performance.

Transfer students in engineering may apply for admission to the Division of Engineering at the time of transfer. If not, then they must apply no later than at the end of their third quarter of study at UCSD. Regardless, transfer students should seek a preliminary appraisal by the department as soon as possible after they decide to attend UCSD.

Admission will be granted to the maximum number of students in each major program consistent with maintaining acceptable program quality. Since enrollments are limited, students may apply to more than one major degree program. Applications must be submitted to the Undergraduate Affairs Office in AMES (1103 Urey Hall) or in CSE and ECE (1782 Applied Physics and Mathematics Building). These offices may be consulted for additional details.

### Admission of Non-engineering Majors to the Division of Engineering Courses

The number of students admitted to upper-division courses offered by the Division of Engineering must be restricted to meet the resources available. Only students who have been accepted as a departmental major (see above) or as a departmental minor, or who are fulfilling a major in another department which requires Division of Engineering courses, will be admitted. A limited number of upper-division courses (e.g., AMES 102, 110, 111, 121A-B, 130A) are open to pre-AMES majors. This exception to the Division of Engineering's policy will be allowed only when required by the curricula. Students must meet specific course prerequisites listed in the catalog course description for all courses.

Applications for admission to upper-division courses in the Division of Engineering that are required, either for a departmental minor or for a major in another department, will be accepted only from students who satisfy the following requirements:

## APPLIED MECHANICS AND ENGINEERING SCIENCES

1. Completion of at least five quarters of study
2. Completion of all lower-division prerequisite courses
3. Completion of six of the following courses:
  - AMES 10
  - CSE 62B or 65, 70
  - ECE 50A, 50B, 50C
  - Chem. 6A, 6B, 6C, 7A, 7B
  - Math. 2A, 2B, 2C, 2D, 2DA, 2EA, 2F
  - Physics 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D

Admission will be granted to a maximum number of students ranked according to their overall grade-point average at the time of application.

## APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)

STUDENT AFFAIRS: 1103 Urey Hall  
 ADMINISTRATIVE OFFICE:  
 5202 Urey Hall

### Professors:

H. Bradner, Ph.D. (*Professor Emeritus*)  
 A. T. Ellis, Ph.D. (*Professor Emeritus*)  
 Y. C. Fung, Ph.D.  
 C. H. Gibson, Ph.D.  
 G. A. Hegemier, Ph.D.  
 M. Intaglietta, Ph.D.  
 P. A. Libby, Ph.D.  
 S.-C. Lin, Ph.D. (*Associate Director, IPAPS*)  
 J. E. Luco, Ph.D.

S. Middleman, D. Eng.  
 J. W. Miles, Ph.D. (*Professor Emeritus*)  
 D. R. Miller, Ph.D.  
 W. Nachbar, Ph.D.  
 S. Nemat-Nasser, Ph.D.  
 D. B. Olfe, Ph.D. (*Chairman*)  
 S. S. Penner, Ph.D. (*Director, UCSD Center for Energy and Combustion Research*)  
 M. J. N. Priestley, Ph.D.  
 E. Reissner, D. Eng., Ph.D. (*Professor Emeritus*)  
 R. E. Roberson, Ph.D.  
 A. M. Schneider, Sc.D.  
 H. W. Sorenson, Ph.D.  
 D. D. Sworder, Ph.D.  
 F. E. Talke, Ph.D. (*CMRR Endowed Chair*)  
 C. W. Van Atta, Ph.D.  
 B. W. Zweifach, Ph.D. (*Professor Emeritus*)

## Four-Year Program in Engineering

| MECHANICAL ENGINEERING  |               |                 | STRUCTURAL ENGINEERING |               |                       |
|-------------------------|---------------|-----------------|------------------------|---------------|-----------------------|
| FALL                    | WINTER        | SPRING          | FALL                   | WINTER        | SPRING                |
| <b>Freshman Year</b>    |               |                 | <b>Freshman Year</b>   |               |                       |
| Math. 2A*               | Math. 2B*     | Math. 2C*       | Math. 2A*              | Math. 2B*     | Math. 2C*             |
| AMES 10                 | Phys. 2A*/2AL | Phys. 2B*       | AMES 10                | Phys. 2A*/2AL | Phys. 2B*             |
| Chem. 7A*, <sup>2</sup> | Chem. 7B/8AL  | AMES 11         | Chem. 7A* <sup>2</sup> | Chem. 7B      | HSS                   |
| HSS <sup>1</sup>        | HSS           | HSS             | HSS <sup>1</sup>       | HSS           | HSS                   |
| <b>Sophomore Year</b>   |               |                 | <b>Sophomore Year</b>  |               |                       |
| Math. 2DA               | Math. 2EA     | Math. 2F        | Math. 2DA              | Math. 2EA     | Math. 2F              |
| Phys. 2C/2CL            | AMES 15       | HSS             | Phys. 2C/2CL           | AMES 15       | HSS                   |
| AMES 121A               | AMES 121B     | AMES 130A       | HSS                    | AMES 102      | AMES 110              |
| HSS                     | HSS           | HSS             | AMES 121A              | AMES 121B     | AMES 130A             |
| <b>Junior Year</b>      |               |                 | <b>Junior Year</b>     |               |                       |
| AMES 105A               | AMES 102      | AMES 170        | AMES 105A              | AMES 163A     | AMES 170              |
| AMES 163A               | AMES 163B     | AMES 121C       | AMES 130B              | AMES 130C     | AMES 132              |
| AMES 130B               | AMES 154      | AMES 110        | AMES 154               | AMES 131A     | AMES 121C             |
| HSS                     | HSS           | HSS             | HSS                    | HSS           | HSS                   |
| <b>Senior Year</b>      |               |                 | <b>Senior Year</b>     |               |                       |
| AMES 101A               | AMES 101B     | AMES 101C       | Math. 120A             | AMES 135      | Math. 183             |
| AMES 171A               | AMES 171B     | TE <sup>3</sup> | AMES 101A              | AMES 101B     | TE <sup>3</sup>       |
| AMES 141A               | AMES 141B     | TE <sup>5</sup> | AMES 133               | AMES 158      | AMES 136 <sup>4</sup> |
| AMES 156A               | AMES 156B     | AMES 158        | AMES 134               | AMES 173      | HSS                   |

\*Courses used to compute the grade-point average upon which admission to the major degree program will be based at the end of the freshman year.

<sup>1</sup>In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. The actual number of HSS courses shown may exceed that needed to satisfy the college requirements and to meet the required minimum of 192 units. In such cases, one of the HSS courses need not be taken. All other non-HSS courses indicated must be taken.

<sup>2</sup>Chem. 7A-B sequence may be replaced by Chem. 6A-B-C sequence, but not 6A-B only.

<sup>3</sup>Technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences, or mathematics, selected with **prior** approval of the department to meet ABET standards.

<sup>4</sup>With departmental approval, AMES 136 may be replaced by other structural design courses such as AMES 131B.

<sup>5</sup>One of the technical elective courses must be selected from a list of approved energy, thermo-science courses available in the AMES student affairs office.

**APPLIED MECHANICS AND ENGINEERING SCIENCES**

**Associate Professors:**

H. Aref, Ph.D.  
 D. A. Gough, Ph.D.  
 R. K. Herz, Ph.D. (*Acting Associate Professor*)  
 H. Murakami, Ph.D.  
 S. Rand, Ph.D.  
 G.W. Schmid-Schoenbein, Ph.D.  
 A. V. Sebald, Ph.D.  
 F. Seible, Ph.D.  
 K. Seshadri, Ph.D.

**Assistant Professors:**

D. J. Benson, Ph.D.  
 P. C. Chau, Ph.D.  
 D. V. Bhaskar Rao, Ph.D.  
 M. Gharib, Ph.D.  
 A. Hoger, Ph.D.  
 J. B. Talbot, Ph.D.

**Affiliated Faculty:**

A. L. Berlad, Ph.D., *Adjunct Professor of Combustion Science*  
 R. D. Blevins, Ph.D., *Adjunct Professor of Flow Acoustics*  
 D. B. Bogy, *Professor of Mechanical Engineering (UC Berkeley)*  
 J. W. Covell, M.D., *Professor of Medicine and Bioengineering*  
 A. Fronek, M.D., Ph.D., *Professor of Surgery and Bioengineering*  
 A. S. Gordon, Ph.D., *Adjunct Professor of Engineering Chemistry*  
 M. K.-W. Kwan, *Assistant Professor of Surgery and Bioengineering in Residence*  
 D. Lim, Ph.D., Sc.D., *Adjunct Professor of Bioengineering and Biomaterials*

K. Messmer, M.D., *Adjunct Professor of Surgery*  
 R. M. Peters, Ph.D., *Professor of Surgery and Bioengineering*  
 M. T. Simnad, Ph.D., *Adjunct Professor of Nuclear Engineering and Materials Science*  
 S. S. Sobin, M.D., Ph.D., *Adjunct Professor of Physiology*  
 C. P. Wang, Ph.D., *Adjunct Professor of Engineering Physics*  
 J. B. West, M.D., Ph.D., *Professor of Medicine and Bioengineering*  
 S. L.-Y. Woo, *Professor of Surgery and Bioengineering*

**Professional Research Staff:**

J. G. Anderson, Ph.D., *Associate Research Engineer*

**Four-Year Program in Engineering**

| CHEMICAL ENGINEERING  |              |                 | ENGINEERING SCIENCE     |                 |           |
|-----------------------|--------------|-----------------|-------------------------|-----------------|-----------|
| FALL                  | WINTER       | SPRING          | FALL                    | WINTER          | SPRING    |
| <b>Freshman Year</b>  |              |                 | <b>Freshman Year</b>    |                 |           |
| Math. 2A*             | Math. 2B*    | Math. 2C*       | Math. 2A*               | Math. 2B*       | Math. 2C* |
| AMES 10               | Phys. 2A*    | Phys. 2B*       | AMES 10                 | Phys. 2A*/2AL   | Phys. 2B* |
| Chem. 6A*             | Chem. 6B/8AL | Chem. 6C/8BL    | Chem. 7A*, <sup>2</sup> | Chem. 7B/8AL    | AMES 11   |
| HSS <sup>1</sup>      | HSS          | HSS             | HSS                     | HSS             | HSS       |
| <b>Sophomore Year</b> |              |                 | <b>Sophomore Year</b>   |                 |           |
| Math. 2DA             | Math. 2EA    | Math. 2F        | Math. 2DA               | Math. 2EA       | Math. 2F  |
| Phys. 2C/2AL          | AMES 111     | AMES 153        | Phys. 2C/2CL            | AMES 15         | HSS       |
| Chem. 141A            | Chem. 141B   | Chem. 143A      | AMES 121A               | AMES 121B       | AMES 130A |
| HSS                   | HSS          | HSS             | HSS                     | HSS             | HSS       |
| <b>Junior Year</b>    |              |                 | <b>Junior Year</b>      |                 |           |
| Chem. 126             | Chem. 127    | Chem. 128       | AMES 105A               | AMES 163A       | AMES 121C |
| AMES 121A             | AMES 163A    | Chem. 105A      | AMES 101A               | AMES 101B       | AMES 101C |
| AMES 103A             | AMES 103B    | AMES 103C       | AMES 130B               | AMES 110        | AMES 170  |
| HSS                   | HSS          | AMES 170        | AMES 154                | TE <sup>3</sup> | TE        |
| <b>Senior Year</b>    |              |                 | <b>Senior Year</b>      |                 |           |
| AMES 112              | AMES 113B    | AMES 114        | AMES 171A               | TE              | Math. 183 |
| AMES 113A             | AMES 115     | TE              | AMES 156A               | TE              | AMES 158  |
| AMES 140              | AMES 176A    | AMES 176B       | TE                      | TE              | TE        |
| HSS                   | TE           | TE <sup>3</sup> | HSS                     | HSS             | HSS       |

\*Courses used to compute the grade-point average upon which admission to the major degree program will be based at the end of the freshman year.

<sup>1</sup>In fulfilling the humanities and social science requirement (HSS), students must take a total of at least twenty-four units in the arts, humanities and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. The actual number of HSS courses shown may exceed that needed to satisfy the college requirements and to meet the required minimum of 192 units. In such cases, one of the HSS courses need not be taken. All other non-HSS courses indicated must be taken.

<sup>2</sup>Chem. 7A-B sequence may be replaced by Chem. 6A-B-C sequence, but not 6A-B only.

<sup>3</sup>Technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences, or mathematics, selected with **prior** approval of the department to meet ABET standards.

## APPLIED MECHANICS AND ENGINEERING SCIENCES

K. Fronek, M.D., Ph.D., *Research Physiologist*  
 K. N. Helland, Ph.D., *Associate Research Engineer*  
 J. K. Leyboldt, Ph.D., *Assistant Research Bioengineer*  
 K. G. P. Sulzmann, Ph.D., *Research Engineer*  
 M. R. T. Yen, *Associate Research Bioengineer and Adjunct Lecturer*

The programs and curricula of AMES emphasize education in fundamentals of engineering sciences. These principles provide a common foundation for all engineering subspecialties. Training with this emphasis is likely to serve students well during a career in which engineering practice may change rapidly.

The instructional and research programs are grouped into six major areas: bioengineering, chemical engineering, mechanical engineering, structural engineering, systems and control engineering, and engineering physics. These programs are characterized by strong interdisciplinary relationships with the Departments of Physics, Mathematics, Biology, Chemistry, Economics, and Electrical Engineering and Computer Sciences and associated campus institutes such as the UCSD Center for Energy and Combustion Research, the Institute for Nonlinear Science, Institute of Geophysics and Planetary Physics, Institute for Pure and Applied Physical Sciences, Center for Magnetic Recording Research, California Space Institute, Scripps Institution of Oceanography, and the School of Medicine.

## The Undergraduate Program

AMES offers two separate types of undergraduate programs. The first is a traditional four-year program leading to the **B.S. degree in engineering** with options in bioengineering, chemical engineering, mechanical engineering, structural engineering, systems and control engineering, and engineering science. The second is a two-year upper-division program leading to a **B.A. or B.S. degree in applied science** with options in either applied mechanics or premedical bioengineering. This upper-division applied science program is designed to accommodate students who do not wish to specialize at an early stage in their college careers. While students are expected to complete the same preparation in mathematics, physics, and chemistry as re-

## Four-Year Program in Engineering

| BIOENGINEERING          |               |                 | SYSTEMS AND CONTROL ENGINEERING |               |            |
|-------------------------|---------------|-----------------|---------------------------------|---------------|------------|
| FALL                    | WINTER        | SPRING          | FALL                            | WINTER        | SPRING     |
| <b>Freshman Year</b>    |               |                 | <b>Freshman Year</b>            |               |            |
| Math. 2A*               | Math. 2B*     | Math. 2C*       | Math. 2A*                       | Math. 2B*     | Math. 2C*  |
| AMES 10                 | Phys. 2A*/2AL | Phys. 2B*       | AMES 10                         | Phys. 2A*/2AL | Phys. 2B*  |
| Chem. 7A*, <sup>2</sup> | Chem. 7B/8AL  | Biol. 1         | Chem. 7A*, <sup>2</sup>         | Chem. 7B      | AMES 11    |
| HSS <sup>1</sup>        | HSS           | HSS             | HSS <sup>1</sup>                | HSS           | HSS        |
| <b>Sophomore Year</b>   |               |                 | <b>Sophomore Year</b>           |               |            |
| Math. 2DA               | Math. 2EA     | Math. 2F        | Math. 2DA                       | Math. 2EA     | Math. 2F   |
| Phys. 2C/2CL            | AMES 15       | HSS             | Phys. 2C/2CL                    | AMES 15       | HSS        |
| AMES 121A               | AMES 121B     | AMES 130A       | AMES 121A                       | AMES 121B     | AMES 110   |
| HSS                     | HSS           | HSS             | HSS                             | HSS           | HSS        |
| <b>Junior Year</b>      |               |                 | <b>Junior Year</b>              |               |            |
| AMES 181                | AMES 182A     | AMES 182B       | Math. 130A                      | Math. 120A    | Math. 120B |
| AMES 154                | AMES 163A     | AMES 170        | AMES 163A                       | AMES 163B     | AMES 170   |
| AMES 103A               | AMES 103B     | AMES 183        | TE <sup>3</sup>                 | AMES 154      | TE         |
| HSS                     | HSS           | HSS             | HSS                             | HSS           | HSS        |
| <b>Senior Year</b>      |               |                 | <b>Senior Year</b>              |               |            |
| Biol. 151               | Biol. 153     | TE <sup>4</sup> | AMES 141A                       | AMES 141B     | AMES 141C  |
| AMES 184A               | AMES 184B     | AMES 184C       | AMES 146A                       | AMES 146B     | AMES 146C  |
| Chem. 126               | AMES 158      | AMES 174        | AMES 162A                       | AMES 162B     | AMES 162C  |
| AMES 105A               | TE            | AMES 186        | AMES 184A                       | AMES 177A     | AMES 177B  |

\*Courses used to compute the grade-point average upon which admission to the major degree program will be based at the end of the freshman year.

<sup>1</sup>In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration. The actual number of HSS courses shown may exceed that needed to satisfy the college requirements and to meet the required minimum of 192 units. In such cases, one of the HSS courses need not be taken. All other non-HSS courses indicated must be taken.

<sup>2</sup>Chem. 7A-B sequence may be replaced by Chem. 6A-B-C sequence, but not 6A-B only.

<sup>3</sup>Technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences, or mathematics, selected with **prior** approval of the department to meet ABET standards.

<sup>4</sup>One technical elective (TE) course must be an upper-division or graduate course in the engineering sciences. The other may be a course in engineering sciences, natural sciences, or mathematics. Both must be selected with **prior** approval of the department to meet ABET standards.

quired for the four-year program, all the departmental major course requirements in the two options are confined to the upper division. The difference between receiving the B.A. or B.S. degree in applied science depends on the total number of units the student completes: the B.A. requires 180 units, the B.S. requires 192 units. The department recommends that all applied science students fulfill the additional unit requirement to receive the B.S. degree, **which must be accomplished with at least twelve units of approved technical elective credit.**

All AMES programs of study have strong components in laboratory, numerical computation on computers and design applications, and are designed to prepare students receiving bachelor's degrees for professional careers or for graduate education in their area of specializa-

tion. In addition, the programs can also be taken by students who intend to use their undergraduate engineering education as preparation for postgraduate professional training in nontechnical fields such as business administration, law, or medicine.

The **chemical engineering** curriculum has been accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The curriculum is a traditional one encompassing studies in organic and physical chemistry, fluid mechanics, heat and mass transfer, separation processes, and reactor and plant design. While many chemical engineering students pursue M.S. or Ph.D. degrees, most seek employment at the B.S. level. Not only are they employed in the traditional petrochemical, food, and polymers industries, but in-

creasing numbers of high-technology industries, such as electronics and aerospace, have employed these students.

**Mechanical engineering** is also a traditional four-year curriculum in mechanics, vibrations, thermodynamics, structures, fluid flow, heat transfer, materials, and mechanical design. This program also has a strong systems controls component so that students have an introduction to the emerging general area of robotics. Graduates of this program may enter the high-technology, electro-mechanical industry, as well as traditional employment in the mechanical and aerospace industry.

**Structural engineering** concerns the design and analysis of civil, mechanical, aerospace, and ocean structures. Examples include bridges, dams, buildings, air-

## Two-Year Upper-Division Program in Applied Science

### Lower-Division Program Preparation

| Computer Programming | Mathematics                       | Physics  | Chemistry                              | Biology  |
|----------------------|-----------------------------------|--|--|----------|
| AMES 10              | Math. 2A*, 2B*, 2C*, 2DA, 2EA, 2F | Phys. 2A*, 2AL, 2B*, 2C, 2CL or 3A*, 2AL, 3B*, 3C, 2CL | Chem. 6A*, 6B, 6C, 8AL or 7A*, 7B, 8AL | Biol. 1† |

\*Courses used to compute the grade-point average upon which admission to the major degree program will be based at the end of the freshman year.  
†Required only for bioengineering majors and/or Revelle College students.

### Upper-Division Major Requirements

| APPLIED MECHANICS <sup>1</sup> |                        |           | BIOENGINEERING: PREMEDICAL <sup>1</sup> |            |           |
|--------------------------------|------------------------|-----------|---|------------|-----------|
| FALL                           | WINTER                 | SPRING    | FALL                                    | WINTER     | SPRING    |
| <b>Junior Year</b>             |                        |           | <b>Junior Year</b>                      |            |           |
| AMES 105A                      | Math. 120A             | Math. 183 | AMES 181                                | AMES 182A  | AMES 182B |
| AMES 121A                      | AMES 121B              | AMES 130A | Chem. 140A                              | Chem. 140B | AMES 170  |
| AMES 154                       | AMES 163A              | AMES 170  | Chem. 143A                              | Biol. 131  | Biol. 101 |
| HSS <sup>2</sup>               | HSS                    | HSS       | HSS <sup>2</sup>                        | HSS        | HSS       |
| <b>Senior Year</b>             |                        |           | <b>Senior Year</b>                      |            |           |
| AMES 101A                      | AMES 101B              | AMES 101C | Biol. 151                               | Biol. 153  | Biol. 156 |
| AMES 130B                      | AMES 130C <sup>3</sup> | AMES 121C | AMES 103A                               | AMES 103B  | AMES 174  |
| AMES 171A                      | AMES 110               | AMES 158  | TE <sup>4</sup>                         | TE         | TE        |
| HSS                            | HSS                    | HSS       | HSS                                     | HSS        | HSS       |

<sup>1</sup>Students in these programs of study may obtain either the B.A. or B.S. in applied science (applied mechanics or bioengineering: premedical). The difference between receiving the B.A. or B.S. depends on the total number of units the student completes: the B.A. requires 180 units, the B.S. requires 192 units. To obtain the B.S. degree, the additional unit requirement must be accomplished with technical electives (see footnote 4).

<sup>2</sup>In fulfilling the humanities and social science requirements (HSS), students must take a total of at least twenty-four units in the arts, humanities and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration.

<sup>3</sup>With departmental approval, AMES 130C may be replaced by either AMES 132 or AMES 133.

<sup>4</sup>Technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences, or mathematics, selected with **prior** approval of the department.



## APPLIED MECHANICS AND ENGINEERING SCIENCES

craft, space craft, ships, oil platforms, automobiles, and other transportation vehicles. This field requires a thorough knowledge of linear and nonlinear behavior of solids (concrete, soils, rock, metals, composite materials, and plastics), those aspects of fluid mechanics related to structural loads, dynamics related to structural response, mathematics for the generation of theoretical structural models and numerical analysis, and computer science for simulated purposes associated with computer-aided design, response analyses, and data acquisition. Basic understanding of material behavior and structural performance is enhanced by laboratory courses involving static and dynamic stress and failure tests of structural models.

**Systems and control engineering** involves mathematical modeling and analysis of complex systems in a wide variety of engineering, physical, and social problems, investigating the dynamics of these

systems, and dealing with methods to control and optimize systems. The term "system" refers to a collection of objects whose characteristics and structure are to be identified for the purposes of predicting and/or controlling its future behavior. Among others, a "system" could be an interplanetary space vehicle, the national economy, a chemical process, or the human circulatory system. Generally, input to and output from the system are observed and used to develop or confirm dynamical mathematical models for the system. With these models, rational decision-making procedures are established and decisions are implemented to achieve prescribed system objectives. In addition to traditional mechanics courses, systems and control engineering students complete sequences in controls, optimization, communication theory, and a microprocessor controls laboratory. With this degree, students are prepared to work in industry or government solving complex interdisciplinary problems.

**Bioengineering** is an interdisciplinary major in which the principles and tools of traditional engineering fields, such as mechanical, electrical, structural, and chemical engineering, are applied to characteristic biomedical problems. Engineering plays an increasingly important role in medicine in projects that range from basic research in physiology to the use of robotics with medical prosthetics emphasis and the improvement of health care delivery. By its very nature, bioengineering is broad and requires a foundation in the engineering sciences as well as in physiology and aspects of basic medical sciences. While the curriculum prepares students for careers in the biomedical industry, many bioengineering graduates go on to medical school. Students completing the four-year B.S. in engineering program have sufficient preparation in applied mechanics to permit employment in traditional engineering areas other than the biomedical industry, if they wish. The two-year B.A./B.S. applied science pre-

### M.S. Program in Systems Science Sample Program

To obtain an M.S. degree in systems science, students can select one sequence in the 100-level courses, and three sequences in the 200-level courses. Note that 162A, B, C or equivalent are prerequisites for 264A,B,C and 248A,B, and 141A-B or equivalent are prerequisites for 241A-B-C.

| Fall  | Winter  | Spring  |
|---|---|---|
| Stat. Communication Theory 162A,<br>or<br>Linear Control System Theory 141A,<br>or<br>Intro. to Optimization 146A | Stat. Communication Theory 162B<br>or<br>Linear Control System Theory 141B<br>or<br>Intro. to Optimization 146B | Stat. Communication Theory 162C<br>or<br>Linear Control System Theory 141C<br>or<br>Intro. to Optimization 146C |
| Estimation and System Identification 264A   | Estimation and System Identification 264B   | Estimation and System Identification 264C   |
| Linear and Nonlinear Systems 241A   | Linear and Nonlinear Systems 241B   | Linear and Nonlinear Systems 241C   |
| Digital Signal Processing 248A  | Digital Signal Processing 248B  | Special topics in Systems Science 207   |
| Stochastic Processes 262A   | Stochastic Processes 262B   | Stochastic Processes 262C   |

NOTE: Not all courses are offered every year.

medical curriculum has significantly less engineering content. It is designed specifically to meet the entrance requirements of most American medical schools and is also suitable for those planning to enter graduate school in bioengineering, physiology, or neurosciences.

The **engineering science** program resembles the mechanical engineering program, except that the amount of mechanical design is reduced and control theory is not required. In addition to core courses in dynamics, vibrations, structures, fluid mechanics, thermodynamics, heat transfer, and laboratory, a large number of technical electives are scheduled. This aspect of the curriculum allows flexibility, permitting specialization and in-depth study in one area of the engineering sciences, or development of a sequence of courses emerging from the current research interests of the faculty of AMES and/or other departments, e.g., sequences in the earth sciences, transportation, or energy-related studies. Students

intending to do postgraduate professional work in nontechnical fields such as business administration, law, or medicine may develop an appropriate sequence of courses. While a sequence in the non-sciences may be permitted, the faculty adviser may insist on a substantial number of AMES or other science courses as technical electives. Clearly, students must consult their advisers to develop a sound course of study to fulfill the technical elective requirements of this program.

**Applied mechanics** is that area of engineering which provides the scientific basis of mechanical, aerospace, and civil engineering. This two-year upper-division program prepares students with breadth in the foundations of these engineering fields. Course work includes applied mathematics, application of computing to engineering problems, fluid dynamics, solid mechanics and structures, particle and rigid-body dynamics, thermodynamics, linear systems analysis, and a sequence in experimental techniques.

### Other Undergraduate Programs of Study in AMES

The **engineering physics** program is jointly offered by the Departments of AMES, ECE, and Physics and is administered by the Department of ECE. See "Engineering Physics Program" under ECE for details.

The **engineering mechanics minor** involves successful completion of a total of six AMES courses, including selected upper-division courses open to pre-AMES students who meet the course prerequisites: one must be 121A; one must be 101A (or 103A) or 130A (or both may be taken); and the balance must be selected from AMES 10, 11, 15, 102, 110, 111 or 121B. This set of courses provides a good introduction to engineering analysis and would be useful to nonengineering majors desiring a background that could be used in professional communication with engineers.

### M.S. Program in Aerospace Engineering

To obtain an M.S. with specialization in aerospace engineering, students must select any four of the following five sequences of classes.

| Fall  | Winter  | Spring  |
|---|---|---|
| Fluid Mechanics<br>210A                               | Fluid Mechanics<br>210B   | Fluid Mechanics<br>210C   |
| Foundations of<br>Solid Mechanics<br>231A             | Elasticity<br><br>231B  | Anelasticity<br><br>231C  |
| Numerical Methods<br>in<br>Engineering Science<br>290 | Computational Fluid<br>Dynamics 223<br>or<br>Finite-Element Methods<br>Solid Mechanics<br>232 | Design and Mechanics<br>in Computer Technology<br>291<br>or<br>Computer-aided<br>Analysis and Design<br>207 |
| Introductory<br>Compressible Flow<br>212              | Introduction to<br>Combustion<br>211  | Mechanics of<br>Propulsion<br>213   |
| Controls<br>141A or 146A<br>or 241A or 246A           | Controls<br>141B or 146B<br>or 241B or 246B   | Controls<br>141C or 146C<br>or 241C or 246C   |

NOTE: Not all courses are offered every year.

## APPLIED MECHANICS AND ENGINEERING SCIENCES

**Other minor or double major** options are restricted. Students wishing to arrange a sequence of AMES courses to satisfy minor or double major requirements, or to meet particular academic interests, must consult the AMES student affairs office for referral to the appropriate AMES faculty member.

### General Information for AMES Undergraduate Students

**Application for Admission to Upper-Division Course Work/Prerequisite and Performance Standards.** Because of the heavy student interest in AMES programs and the limited resources available to accommodate this demand, maintenance of a quality educational program makes it necessary to limit enrollments to the most qualified students. Admission to the department as an AMES major or minor, or to fulfill a major in another department which requires AMES courses, is in accordance with the general requirements established by the Division of Engineering. The admission requirements and procedures are described in detail in the

section on "Admission to the Division of Engineering" in this catalog. Once admitted to the department, students must continue to meet prerequisite and performance standards, i.e., students may not enroll in AMES courses prior to having satisfied prerequisite courses with a C- or better. Additional details are given under the various program outlines and course descriptions below. Students who do not meet these specific performance standards may still be admitted to upper-division courses by petition to the department. The department will judge these petitions on the basis of the student's current overall GPA and will normally require a GPA of at least 2.7 overall.

The department expects that students will adhere to these policies of their own volition and enroll in courses accordingly. Students should seek annual advising and reviewing of their program by the department. In addition, students need to obtain a departmental stamp on class enrollment cards prior to admission to AMES courses. Students are advised that they may be dropped at any time from course rosters if prerequisites and/or performance standards have not been met. Addi-

tional enrollment policies may be announced in the future and will be given with advance notice. Students are advised that most AMES courses are offered only once a year and therefore should be taken in the recommended sequence. If courses are taken out of sequence, it may not always be possible to enroll in courses as desired or needed, and students should seek immediate departmental advice. When a student deviates from the sequence of courses specified for each curriculum in this catalog, it may be impossible to complete an AMES major within the normal four-year period.

**Transfer Students.** Transfer students may apply for admission to either the applied science or engineering program. Requirements for admission as an AMES major or minor, or into AMES courses are the same for transfer students as they are for continuing students (see section on "Admission to the Division of Engineering" in this catalog). Accordingly, when planning their program, transfer students should be mindful of lower-division prerequisite course requirements upon which admission to the major is based, as well as for meeting collegiate requirements.

### M.S. Program in Mechanical Engineering

| Fall  | Winter  | Spring  |
|---|---|---|
| Foundations of Solid Mechanics<br>231A<br>or<br>Fluid Mechanics<br>210A | Elasticity<br><br>231B<br>or<br>Fluid Mechanics<br>210B                                       | Anelasticity<br><br>231C<br>or<br>Fluid Mechanics<br>210C   |
| Numerical Methods in Engineering Science<br>290                         | Finite Element Methods in Solid Mechanics<br>232<br>or<br>Computational Fluid Dynamics<br>223 | Design and Mechanics in Computer Technology<br>291<br>or<br>Computer-aided Analysis and Design<br>207 |
| Material Science<br><br>207   | Dynamics<br><br>207   | Manufacturing Processes<br><br>207  |
| Controls<br>141A or 146A<br>or 241A or 246A                             | Controls<br>141B or 146B<br>or 241B or 246B   | Controls<br>141C or 146C<br>or 241C or 246C   |

NOTE: Not all courses are offered every year.

Students who have taken equivalent courses elsewhere may have transfer credit approved towards the major departmental requirements by submitting a transfer student petition for review by the AMES undergraduate affairs committee. Transfer student petitions are available from the student affairs office.

**Program Alterations/Exceptions to Requirements.** Variations from any program requirements are possible only if a petition is approved by the AMES faculty adviser and the AMES undergraduate affairs committee *before* the courses in question are taken. In addition, exceptions to any course requirements will be considered only by petition to the department. Petition forms may be obtained from the AMES student affairs office and must be processed through this office.

**Advisers.** An AMES faculty adviser is assigned for each class of students and for each AMES option. A record of advisers' names may be obtained from the AMES student affairs office. Students must meet with their faculty adviser or the AMES program representative in the AMES student affairs office to design a

study plan as soon as AMES has been designated as a major. This plan may be revised in subsequent years, but such a revision must be approved by the faculty adviser or AMES program representative. Because some course and/or curricular changes may be made every year, it is imperative that students meet with their adviser each year.

**Independent Study.** AMES students may take AMES 199, Independent Study for Undergraduates, as an elective course under the guidance of an AMES faculty member. This course may be used to satisfy upper-division course requirements for the major only under very restrictive conditions. Policy regarding use of AMES 199 as technical elective credit may be obtained from the student affairs office. Students may propose to a faculty member a research or study topic. After obtaining the faculty member's concurrence on the topic and scope of the study, the student must submit a Special Studies Course form (each quarter) and an AMES 199 as Technical Elective Contract form available from the student affairs office to the undergraduate affairs committee.

These forms must be completed, approved, and processed *prior* to the beginning of the quarter in which the course is to be taken. This should not be done during the add/drop period.

**Early Admission to the M.S. Degree — A Combined B.S./M.S. Program.**

Upper-division students who have three quarters of residence at UCSD, with a grade-point average of 3.5 or better, may apply for "early admission" to the department's M.S. program. Qualified students should apply at the beginning of the spring quarter of the junior year. Upon successful completion of the B.S. requirements with an overall grade-point average of at least 3.0, students who have been accepted will be guaranteed admission to the AMES graduate program leading to the M.S. degree. This scheme is designed to allow students and their advisers to develop a five-year program of study, leading to both the B.S. and M.S. degrees, in which both undergraduate and graduate courses are taken during the fourth and fifth years. For students wishing to pursue the M.S. degree, this program has the advantage of allowing students to develop

**M.S. Program in Structural Engineering\***

| Fall   | Winter  | Spring  |
|--|---|---|
| Foundations of Solid Mechanics<br>231A   | Elasticity<br>231B  | Anelasticity<br>231C  |
| Advanced Structural Analysis<br>230<br>or<br>Theory of Shells<br>235A          | Structural Stability<br>236<br>or<br>Theory of Shells<br>235B | Structural Dynamics<br>237  |
| Advanced RC/PC Design<br>240<br>or<br>Mechanics of Composite Materials<br>233A | Bridge Design<br>242<br>or<br>Micromechanics<br>233B          | Earthquake Engineering<br>239<br>or<br>Fracture Mechanics<br>233C |
| Applied Mathematics<br>105A<br>or<br>294A                                      | Finite Element Methods in Solid Mechanics<br>232              | Experimental Mechanics<br>234<br>or<br>Independent Study 296      |

\* Includes civil structures and aerospace and marine structures.  
NOTE: Not all courses are offered every year.

an in-depth specialization or to broaden their education while having considerable flexibility in course scheduling. At the end of any quarter in which the B.S. requirements are fulfilled, the student is automatically considered a graduate student, and all appropriate courses which have not been used to satisfy the requirements for the B.S. degree are applied toward the requirements for the M.S. degree (see section on "Master's Degree Program" in this catalog).

### DEGREE REQUIREMENTS

The programs of study offered by the Department of AMES are outlined in the following tables and indicate the specific course requirements for each option. Deviations from these programs of study must be approved by the faculty adviser and the undergraduate affairs committee *prior* to taking alternative courses. While students with different academic preparation may vary the scheduling of lower-division courses such as math, physics and chemistry, students should consult the department about deviations in scheduling of AMES upper-division courses. Most AMES courses are taught only once per year, and courses are scheduled to be consistent with the curricula as shown in the tables. A tentative schedule of course offerings is available in the department each spring.

To graduate, students must maintain an overall grade-point average of at least 2.0, and the department requires at least a C - grade in each course required for the major.

Each program allows for humanities and social science (HSS) courses so that students can fulfill their college requirements. Students must consult their college to determine which HSS courses to take. However, in developing a program, students must take a total of *at least* twenty-four units in the arts, humanities and social sciences, not including subjects such as accounting, industrial management, finance, or personnel administration.

Technical elective (TE) course selections are restricted to meet ABET standards, and must have departmental approval **prior** to taking the courses. Courses such as Biology 195, AMES 195, 197, or 198 are not allowed as technical electives in meeting the upper-division major requirements. AMES 199 courses are allowed as technical electives only under restrictive conditions. Policy regarding these conditions may be obtained from the department's student affairs office.

### The Graduate Program

The Department of Applied Mechanics and Engineering Sciences offers graduate instruction leading to the **M.S. degree in engineering sciences** with specialization in structural and mechanical engineering and to the **M.S. and Ph.D. degrees in engineering sciences** with specialization in each of the following areas: aerospace engineering, applied mechanics, applied ocean sciences, chemical engineering, bioengineering, engineering physics, and systems science.

The instructional and research programs are characterized by strong interdisciplinary relationships with the Departments of Electrical Engineering and Computer Sciences, Economics, Mathematics, Physics and Chemistry, and with associated campus institutes such as the California Space Institute, Center for Magnetic Recording Research, Institute for Pure and Applied Physical Sciences, Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, UCSD Center for Energy and Combustion Research, the Institute for Nonlinear Science, and the School of Medicine.

Admission is in accordance with the general requirements of the graduate division. Candidates with bachelor's or master's degrees in mathematics, the physical sciences, or any branch of engineering are invited to apply. The department requires that *all* applicants submit scores from the Graduate Record Examination.

While students are welcome to seek enrollment in AMES courses via UC Extension's concurrent registration program, an extension student's enrollment in an AMES graduate course must be approved by the instructor.

### MASTER'S DEGREE PROGRAM

The department offers the M.S. degree in engineering sciences with a designated specialization in aerospace engineering, applied mechanics, applied ocean sciences, bioengineering, chemical engineering, engineering physics, mechanical engineering, structural engineering or systems science. The M.S. degree is offered under both the Thesis Plan I and the Comprehensive Examination Plan II (see "Graduate Studies: Master's Degree"). A strong effort is made to schedule M.S.-level course offerings so that students may obtain their M.S. degree in one year of full-time study or two years of part-time study.

Students with baccalaureate degrees

may wish to round out their professional training by taking a fifth year of study and consider the M.S. degree as terminal.

Other students may obtain the M.S. degree on the way toward the doctorate.

Students who are admitted for a master's degree only and subsequently wish to continue towards a Ph.D., must be re-evaluated. Prior to taking the M.S. examination, the student applies for admission to the Ph.D. program, and the M.S. committee is informed of the student's desire to continue. If necessary, the committee may broaden the scope of the examination in order to assess the student's Ph.D. potential. Based on the examination, the M.S. committee makes a recommendation relative to the student's suitability to continue for the Ph.D. With the approval of the Ph.D. committee, the M.S. exam may be counted as having satisfied one area of the Departmental Qualifying examination.

Course requirements are left flexible in the applied mechanics, chemical engineering, engineering physics, and systems science programs (see sample program below). Course requirements for the aerospace engineering, mechanical engineering, and structural engineering programs are outlined in the M.S. program charts below. (Bioengineering and applied ocean sciences students have specific core course requirements; see below for details.) Specific departmental requirements for the M.S. degree are as follows:

**Thesis Plan I:** This plan of study involves both course work and research, culminating in the preparation of a thesis. A total of forty-eight units of credit is required: forty units (ten courses) must be in course work, and eight units must be in research. The student's program is arranged, with prior approval of the faculty adviser, according to the following policies:

1. Course work must include sixteen units (four courses) of AMES 200-level courses.
2. Units obtained in AMES 206, 259, 281, or 299 may not be applied toward the course work requirement.
3. No more than a total of eight units of AMES 296 and 298 may be applied toward the course work requirement.
4. No more than twelve units of upper-division, 100-level, courses may be applied toward the course work requirement.
5. Eight units of AMES 299 must be taken to fulfill the research requirement.



Students must maintain at least a B average in the courses taken to fulfill the degree requirements. A thesis based on the research is written and subsequently reviewed by the thesis adviser and two other faculty members appointed by the dean of Graduate Studies. The review is normally an oral defense of the thesis.

### **Comprehensive Examination Plan II:**

This plan of study involves course work only and culminates in a comprehensive examination. A total of forty-eight units credit (twelve courses) is required. The student's program is arranged, with prior approval of the faculty adviser, according to the following policies:

1. At least sixteen units (four courses) must be AMES 200-level courses.
2. Units obtained in AMES 206, 259, 281, or 299 may not be applied toward the degree requirements.
3. No more than a total of eight units of AMES 296 and 298 may be applied toward the degree requirements.
4. No more than twelve units of upper-division, 100-level courses may be applied toward the degree requirements.

Students must maintain at least a B average in the courses taken to fulfill the degree requirements. The comprehensive examination is conducted by the adviser and at least two other faculty members. The examination committee normally conducts an oral examination in the candidate's area of specialization. A student working toward the Ph.D. degree who has successfully passed one area of the department's Ph.D. examination need not take the comprehensive examination for the M.S. degree.

**Bioengineering students** are required to take the bioengineering core graduate courses, AMES 271A-B-C and AMES 272, 273, 278A and pass with a grade of B or better. A new graduate student who does not meet the prerequisites of these core courses may have to take some basic courses to make up the deficiency. Thus, a student deficient in mathematics and mechanics may have to take Math. 110, AMES 103B, 181, 182A-B in the first year and AMES 272, 273, 278A in the second year. A student deficient in biology and chemistry may have to take Chemistry 126 or 131 and Biology 151, 153 in the first year and AMES 271A-B-C in the second year.

**Applied ocean sciences students** should note that they will be expected to demonstrate proficiency in mathematics

and oceanography. Accordingly, when planning course programs they should enroll in AMES 294A-B-C (Methods in Applied Mechanics) and in some of the Scripps core courses, such as 210A (Physical Oceanography), 240 (Marine Chemistry), and 270A (Biological Oceanography).

Successful candidates receive the M.S. degree in engineering sciences with a designated specialization in aerospace engineering, applied mechanics, applied ocean sciences, bioengineering, chemical engineering, engineering physics, mechanical engineering, structural engineering or systems science.

### **DOCTORAL DEGREE PROGRAM**

The AMES Ph.D. program is intended to prepare students for a variety of careers in research and teaching. Therefore, research is initiated as soon as possible, commensurate with the student's background and ability. In general, there are no formal course requirements for the Ph.D., with the exception of bioengineering and applied ocean sciences students who do have specific core course requirements (see below for details). All students, in consultation with their advisers, develop course programs that will prepare them for the AMES departmental examination and for their dissertation research.

The department offers the Ph.D. degree in engineering sciences, with one of the special fields — aerospace engineering, applied mechanics, applied ocean sciences, bioengineering, chemical engineering, engineering physics or systems science — designated.

**Bioengineering students** are required to take the bioengineering core graduate courses, AMES 271A-B-C and AMES 272, 273, 278A and pass with a grade of B or better. A new graduate student who does not meet the prerequisites of these core courses may have to take some basic courses to make up the deficiency. Thus, a student deficient in mathematics and mechanics may have to take Math. 110, AMES 103B, 181, 182A-B in the first year and AMES 272, 273, 278A in the second year. A student deficient in biology and chemistry may have to take Chemistry 126 or 131 and Biology 151, 153 in the first year and AMES 271A-B-C in the second year.

**Applied ocean sciences students** should note that they will be expected to demonstrate proficiency in mathematics and oceanography. Accordingly, when planning course programs they should

enroll in AMES 294A-B-C (Methods in Applied Mechanics) and in some of the Scripps Core Courses, such as 210A (Physical Oceanography), 240 (Marine Chemistry), and 270A (Biological Oceanography).

A departmental examination is given to each Ph.D. candidate prior to his or her formal Ph.D. qualifying examination. This departmental examination normally is taken after the completion of three to six quarters of full-time graduate work and seeks to examine the student's academic and research ability. It is administered by a committee which includes at least four faculty members, three of whom must be AMES faculty. Three of the four are nominated by the student's adviser, and the fourth is appointed by the department chairperson. To ensure breadth, each student must specify four areas of specialization, with each area defined as the subject material taught in a specified group of three or more related graduate courses. Proficiency in one area may be satisfied by grades of A or B in the courses. The departmental examination must include at least three areas, with at least two of the areas being defined by AMES graduate courses. The same AMES course cannot be used in the definition of more than one AMES area. Subject material covered in AMES 206, 259, 281, 296, 297, or 299 courses is not considered acceptable for the satisfaction of the AMES area requirement.

After satisfactory completion of the departmental examination, a graduate student in AMES must pass the formal Ph.D. qualifying examination administered by the student's doctoral committee (see "Graduate Studies: the Ph.D.>").

There is no formal foreign language requirement for doctoral candidates. Students are expected to master whatever language is needed for the pursuit of their own research.

### **Candidate in Philosophy Degree**

AMES Ph.D. students who have passed their Ph.D. qualifying examinations and have advanced to candidacy are awarded the Candidate in Philosophy degree (see "Graduate Studies: Candidate in Philosophy Degree").

### **Courses**

*The Department of AMES has prerequisite and performance standards which apply to all students wishing to enroll in AMES upper-division courses. These re-*

## APPLIED MECHANICS AND ENGINEERING SCIENCES

quirements are enforced by use of a department stamp in order to enroll. Please see "Engineering, Division of," regarding admission procedures. In addition, once admitted to upper-division courses, in order to continue, students must satisfy each prerequisite course with a grade of C- or better (the department does not consider D or F grades as adequate preparation for subsequent material). The department expects that students will adhere to these policies of their own volition and enroll in courses accordingly. Students are advised that they may be dropped at any time from course rosters if prerequisites and/or performance standards have not been met.

### Lower Division

#### 10. FORTRAN for Engineers (4)

FORTRAN 77 computer programming language and its application to the solution of numerical problems. Command and editing in the interactive mode on the VAX computer under the VMS operating system. Emphasis on good programming practices. (Students may not receive duplicate credit for AMES 10, Biol. 181, Chemistry 134 or ECE 64.)

#### 11. Elements of Materials Science (4)

The structure of engineering materials and how these structures can be controlled to produce desired, useful properties. Environmental effects: corrosion and oxidation. *Prerequisites:* Phys. 2A or 3A, Math. 2A-B, and Math. 2C (or concurrent registration).

#### 15. Introduction to Engineering Graphics and Design (4)

Introduction to the basic principles and language of engineering graphics and design. Weekly computer graphics laboratory sessions, along with free-hand and instrument drawing. Graphics topics include sketching; lettering and dimensioning; orthographic, oblique, and axonometric projections; perspective. Lectures and readings on engineering design, including basic design concepts and case histories of design projects. *Prerequisites:* AMES 10 or concurrent enrollment. Department stamp required for enrollment. (W,S)

#### 35. Society and the Sea (4)

Introduction to the oceans and their relationship to man. Selected topics include living and nonliving resources, sea-ports, and sea travel; legal, economic, military, and social aspects; coastal zone management, scientific research, and the sea and weather.

### Upper Division

#### 101A-B. Introductory Fluid Mechanics (4-4)

Hydrostatics with application to submerged surfaces and structure of atmospheres. Bernoulli's equation, its extension and application. Integral momentum and energy theorems, similitude and dimensional analysis. Potential flow, boundary layers, compressible flow including shock waves, generalized one-dimensional flow. *Prerequisites:* admission to the major and grades of C or better in Phys. 2A, Math. 2DA, 2F, and AMES 110 (or concurrent registration with AMES 101B). Enrollment in 101B requires a grade of C or better in 101A. Department stamp required for enrollment. (F,W)

#### 101C. Heat Transfer (4)

Extension of AMES 101A-B to viscous, heat-conducting flows. Application of the energy conservation equation to heat transfer ducts and external boundary layers. Introduction to heat conduction and radiation transfer. Calculation of heat coefficients in forced and free convection. Design applications and heat exchangers. *Prerequisites:* AMES 101A-B with grades of C or better. Department stamp required for enrollment. (S)

#### 102. Mechanical Behavior of Materials (4)

Mechanical tests, elasticity and anelasticity, dislocations and microplasticity of crystals, plastic deformation and creep, fracture and strengthening mechanisms, ceramics and other inorganic nonmetallics, polymers. Laboratory demonstra-

tions of selected topics. *Prerequisites:* grades of C or better in Math. 2A-B-C, Phys. 2A-B-C or Phys. 3A-B-C, and Chem. 6A or 7A (or concurrent registration). Department stamp required for enrollment. (W)

#### 103A. Introductory Fluid Mechanics (4)

Equations of motion; non-Newtonian fluids; hydrostatics; Bernoulli's equation; viscous flows; turbulence, applications to chemical engineering and bioengineering. (Students may not receive credit for both AMES 101A and AMES 103A; priority enrollment will be given to bioengineering and chemical engineering majors.) *Prerequisites:* admission to the major and grades of C or better in Phys. 2A and Math. 2DA, 2F. Department stamp required for enrollment. (F)

#### 103B. Mass Transfer (4)

Diffusive and convective mass transfer in solids, liquids, and gases; steady and unsteady state; mass transfer coefficients; applications to chemical engineering and bioengineering. (Priority enrollment will be given to bioengineering and chemical engineering majors.) *Prerequisites:* AMES 103A or 101A with grade of C or better. Department stamp required for enrollment. (W)

#### 103C. Heat Transfer (4)

Conduction, convection, radiation heat transfer; design of heat exchangers. (Students may not receive credit for both AMES 101C and AMES 103C; priority enrollment will be given to bioengineering and chemical engineering majors.) *Prerequisites:* AMES 103A-B or AMES 101A-B with grades of C or better. Department stamp required for enrollment. (S)

#### 105A-B-C. Introduction to Mathematical Physics (4-4-4)

Ordinary differential equations, Fourier series. Sturm-Liouville theory, elementary partial differential equations, complex variables, and integral transforms with applications to problems in particle and rigid-body dynamics, vibrations, wave motion, electric circuits, heat conduction, and fluid dynamics. (Students may not receive credit for both AMES 105A-B-C and ECE 105A-B-C.) *Prerequisites:* admission to the major and grades of C or better in Phys. 2A-B and Math. 2DA. Enrollment in 105B-C requires grades of C or better in 105A-B. Department stamp required for enrollment.

#### 110. Thermodynamics (4)

First and second laws and selected applications, e.g., thermo-chemistry, heat capacities and heats of reaction, engine cycles, etc. *Prerequisites:* grades of C or better in Phys. 2A and Chem. 6B or 7B (or concurrent registration). Department stamp required for enrollment. (W,S)

#### 111. Thermodynamics (4)

Thermodynamic behavior of pure substances and mixtures. Properties of solutions, phase equilibria. Thermodynamic cycles. Chemical equilibria for homogeneous and heterogeneous systems. *Prerequisites:* Grades of C or better in Phys. 2A and Chem. 6B or 7B (or concurrent registration). Department stamp required for enrollment. (W)

#### 112. Separation Processes (4)

Principles of analysis and design of systems for separation of components from a mixture. Topics will include staged operations (distillation, liquid-liquid extraction), and continuous operations (gas absorption, membrane separation) under equilibrium and nonequilibrium conditions. *Prerequisites:* grades of C- or better in Chem 126, 127, and AMES 103A-B-C. Department stamp required for enrollment. (F)

#### 113A. Chemical Reaction Engineering (4)

Principles of analysis and design of chemical reactors with emphasis on homogeneous reactions. Treatment of kinetic data, design of batch and continuous reactors, nonisothermal effects, selectivity considerations, residence time distribution. *Prerequisites:* admission to the major and grades of C- or better in Chem. 126, 127, 128 and AMES 103A-B-C. Department stamp required for enrollment. (F)

#### 113B. Chemical Reaction Engineering (4)

Introduction to heterogeneous chemical reactions including heterogeneous catalysis, heat and mass transfer effects. Strong emphasis on numerical simulation and computer-aided design of chemical reactors. *Prerequisites:* admission to the major and grades of C- or better in AMES 112, 113A, 140 and concurrent registration in AMES 115. Department stamp required for enrollment. (W)

#### 114. Plant and Process Design (4)

Engineering and economic analysis of integrated chemical processes, equipment, and systems. Cost estimation, heat

and mass transfer equipment design and costs. Integrated plant design. Optimal design. Profitability. *Prerequisites:* grades of C or better in AMES 112A-B and 113. Department stamp required for enrollment. (S)

#### 115. Computer-Aided Design of Chemical Processes (4)

Introduction to techniques for computer-aided analysis of chemical processing systems. Development of mathematical models to describe dynamic and steady-state process behavior. Representation of the structure of complex, interconnected chemical processes with arbitrary recycle stream. Numerical methods for solving resulting systems of nonlinear differential and algebraic equations. *Prerequisites:* grades of C or better in AMES 112, 113A, and 153. Department stamp required for enrollment. (W)

#### 119A. Energy: Demands, Resources, Impact, Technology, and Policy (4)

(Same as STPA 119A) Past and estimated future energy demands. Renewable and nonrenewable energy resources. Economic impact of energy use. geophysical impact of energy use. Energy conservation in manufacturing, transportation, home use. Energy policy. *Prerequisites:* grades of C or better in Math. 2A-B-C-D, Phys. 2A-B-C, and Chem. 6A-B. Department stamp required for enrollment.

#### 119B. Energy: Non-Nuclear Energy Technologies (4)

(Same as STPA 119B) Oil recovery from tar sands and oil shale. Coal production, gasification, liquification. The hydrogen economy. Energy storage systems. Techniques for direct energy conversion. Solar energy utilization. Energy from windmills. Tidal and wave energy utilization. Hydroelectric power generation. Hydrothermal energy. Geothermal energy from hot rocks. Electrical power production, transmission, and distribution. *Prerequisite:* consent of instructor. Department stamp required for enrollment.

#### 119C. Energy: Nuclear Energy Technologies (4)

(Same as STPA 119C) A brief survey of energy demands and resources. Available nuclear energy, physical background — thermal dynamics — atomic and nuclear physics; fission and fusion processes, physics of fission reactions — engineering aspects — safety and environmental effects, fusion, scaling laws, and start-up criteria — laser fusion, magnetic confinement — equilibrium instability. *Prerequisite:* consent of instructor. Department stamp required for enrollment.

#### 121A. Dynamics I "Statics" (4)

Principles of statics for particles and rigid bodies. Three-dimensional equilibrium analysis with unit vector representation. Analysis of simple, statically determinate structures under discrete and distributed loading; hydrostatics, internal forces in beams. Virtual displacements and the principle of virtual work. Potential energy and stability of equilibrium. Lectures include methods of problem formulation and problem solution with application to realistic engineering problems. *Prerequisites:* Math. 2C and Phys. 2A or 3A with grades of C- or better. Department stamp required for enrollment. (F,W)

#### 121B. Dynamics II "Dynamics" (4)

Kinematics and kinetics of particles in three-dimensional vector representation; orbital mechanics. Work, energy and power for particle motion, conservative forces and conservation principles. Principle of impulse and momentum, impulsive motion and impact. Relative motion and conservation principles for systems of particles with variable mass; applications to fluid flow and rocket propulsion. Rigid body kinematics, rolling and sliding motions. Impact of rigid bodies. One-degree of freedom undamped vibrating systems resonance under sinusoidal excitation. Lectures include methods of problem formulation and problem solution with application to realistic engineering problems. *Prerequisites:* Math. 2DA and AMES 121A with grades of C- or better. Department stamp required for enrollment. (W)

#### 121C. Dynamics III "Vibrations" (4)

Free and forced vibrations of damped one-degree of freedom systems; vibration isolation, impact and packaging problems. Analysis of discrete multiple-degree of freedom systems using matrix representation, normal mode of frequencies and modal matrix formulation. Applications include response of buildings to ground motion. Lagrange's equations. Modal superposition for analysis of continuous vibrating systems. Problems of elastic bars and beams include free, impact-excited and sinusoidally forced vibrations. Lectures include methods of problem formulation and problem solution with application to realistic engineering problems.

*Prerequisites: Math. 2EA, AMES 105A, and AMES 121B with grades of C- or better. Department stamp required for enrollment. (S)*

**130A. Solid Mechanics I (4)**

Mechanics of deformable bodies under axial, torsional, shearing and bending loads. Problems of design for pressure vessels, circular shafts, thin-walled members, and standard rolled-steel shapes. *Prerequisites: grades of C or better in Phys. 2A-B-C, Math. 2DA-2EA, and AMES 121A. Department stamp required for enrollment. (S)*

**130B. Solid Mechanics II (4)**

Transformation laws for stress and strain in indicial notation; field equations and constitutive relations. Exact solutions for planar and axially symmetric problems. St. Venant torsion and simple bending. Extremum principles and applications to numerical and approximate solutions. Structural stability. *Prerequisites: admission to the major and grades of C or better in AMES 121B, 130A, and Math. 110 (or concurrent registration). Department stamp required for enrollment. (F)*

**130C. Solid Mechanics III (4)**

Linear and nonlinear one-dimensional theory of straight and curved beams. Small deflection theory of plates. Solutions for rectangular and circular plates. Buckling of rectangular plates. Large deflections and shear deformations. Energy methods and finite element method of analysis. *Prerequisite: grade of C or better in AMES 130B. Department stamp required for enrollment. (W)*

**131A. Soil Mechanics (4)**

General introduction to physical and engineering properties of soils. Soil classification and identification methods. Soil exploration, sampling, and in-situ testing techniques. Permeability, seepage, and consolidation phenomena. Bearing capacity equations, stress distribution, and settlements. Lectures, three hours per week; lab, three hours per week. *Prerequisite: grades of C or better in AMES 130A-B. Department stamp required for enrollment. (W)*

**131B. Foundation Engineering (4)**

Application of soil mechanics to the analysis, design, and construction of foundations for structures. Settlement of structures, bearing capacities of shallow and deep foundations; earth pressures on retaining structures and slope stability. *Prerequisites: admission to the major and grade of C- or better in AMES 131A. Department stamp required for enrollment.*

**132. Structural Analysis (4)**

Classical methods of analysis of determinate and indeterminate trusses, beams, and frames including virtual work, slope deflection, and moment distribution methods. Energy principles and matrix methods of elastic structural analysis as applied to complex two- and three-dimensional structures. Step-by-step development of computer codes for the analysis of civil, mechanical, and aerospace structures from the matrix formulation of the classic structure theory, through the direct stiffness formulation, to production-type structural analysis programs. *Prerequisites: grades of C or better in AMES 130A-B and AMES 154. Department stamp required for enrollment. (S)*

**133. Finite Element Methods (4)**

Development of stiffness and mass matrices based upon variational principles and application to static, dynamic, and stability design problems in structural and solid mechanics. Architecture of computer codes for linear and nonlinear finite element analysis and basic computer implementation. The use of general purpose finite element structural analysis codes. *Prerequisites: grades of C or better in AMES 130A-B and 154; AMES 130C recommended. Department stamp required for enrollment. (F)*

**134. Structural Design Principles-Application to Metallic Structures (4)**

Design and loadings of structural systems. Working stress and ultimate strength design theories. Properties of metallic structural building materials. Elastic design of beams and columns. Design of riveted, bolted, and welded connections. Introduction to plastic design. *(Priority enrollment given to structural engineering majors.) Prerequisite: grade of C or better in AMES 132. Department stamp required for enrollment.*

**135. Analysis and Design of Reinforced Concrete Structures (4)**

Principles and general code provisions for reinforced concrete design. Concrete and reinforcement properties. Design of concrete members including beams, slabs, and columns.

Bend, anchorage, and detailing problems. Design, behavior, and serviceability of reinforced concrete structures. *(Priority enrollment given to structural engineering majors.) Prerequisites: grades of C or better in AMES 132 and 134. Department stamp required for enrollment. (W)*

**136. Design of Prestressed Concrete Structures (4)**

Concept of prestressing. Materials and prestressing systems. Design of prestressed concrete members. Prestress losses and time dependent effects. Application of prestressed concrete for buildings, bridges, and shells. Prestressing for the rehabilitation of structures. *(Priority enrollment given to structural engineering majors.) Prerequisite: grade of C or better in AMES 135. Department stamp required for enrollment. (S)*

**139. Reliability of Engineering Systems (4)**

Safety of time-invariant engineering systems under uncertainty. Review of probability. Probabilistic failure criteria. Single-mode failure. Multicomponent systems. Redundant systems. Fault trees. Problems of design and decision, including economic cost-benefit. Applications to structural, mechanical, and other fields of engineering. *Prerequisites: admission to the major and Math. 183 or AMES 162A or equivalent. Prerequisite may be taken concurrently with consent of instructor. Department stamp required for enrollment. (S)*

**140. Chemical Process Dynamics and Control (4)**

Optimum steady-state design and control. Dynamical behavior of chemical process units such as chemical reactors, separation units, and heat exchangers. Examination of linear, linearized, and nonlinear process models. Stability analysis. Design of simple PID controllers. Bode diagrams and root locus techniques. Introduction to multivariable control systems. Cascade, modal, and feedforward control. Selection of control and measurement variables. *(Students may not receive credit for both AMES 140 and 141A.) Prerequisites: Grade of C or better in AMES 163A, or consent of instructor. Department stamp required for enrollment. (F)*

**141A. Linear Control System Theory (4)**

Classical analysis and design of continuous linear feedback control systems, emphasizing Laplace transform and frequency-domain methods. Stability by root locus, Bode, Nyquist, and Nichols plots. Transient and steady-state behavior. Error constants. Lead, lags and proportional-plus-integral-plus derivative compensators. *Prerequisite: grade of C or better in AMES 163B. Department stamp required for enrollment. (F)*

**141B. Linear Control System Theory (4)**

Extension of AMES 141A. Time-domain, state-variable formulation of the control problem. Feeding back the state variables to gain control of closed-loop poles. The state-transition matrix. The Z-transform: its application to analysis of systems using digital computers as real-time controllers. Design of digital control algorithms. *Prerequisite: grade of C or better in AMES 141A. Department stamp required for enrollment. (W)*

**141C. Problems in System Design (4)**

Translation of task requirements into practical system models. Consideration of such problems as stability of continuous and digitally-controlled systems, word-length and sampling-rate of digital controllers, accuracy, disturbance rejection, and complexity of implementation. Application of these concepts to a project of current interest in engineering practice. *Prerequisite: grade C or better in AMES 141B. Department stamp required for enrollment. (S)*

**146A-B-C. Introduction to Optimization and Applications (4-4-4)**

Unconstrained optimization. Constrained and discrete optimization. Linear or non-linear programming. Kuhn-Tucker conditions. Simplex method. Design of effective computational procedures for solving optimization problems. Optimal control problems; design of linear quadratic-optimal controllers, dynamic programming, maximum principle, calculus of variations, two-point value problems. *Prerequisites: admission to the major and grades of C or better in Math. 2EA and 130A. Enrollment in 146B-C requires grades of C or better in 146A-B. Department stamp required for enrollment. (F,W,S)*

**151. Topics in Engineering Science (4)**

A course to be given at the discretion of the faculty in which topics of current interest in engineering will be presented by visiting or resident faculty members. *Prerequisite: consent of instructor. Department stamp required for enrollment. (F,W,S)*

**152. Topics in Engineering Design (4)**

A course to be given at the discretion of the faculty in which topics of current interest in applied engineering design will be investigated by resident faculty members or by practicing engineers. Priority enrollment for particular design courses may be given to students in the appropriate degree program. *Prerequisites: consent of instructor. Department stamp required for enrollment. (F,W,S)*

**153. Numerical Methods in Chemical Engineering (4)**

Introduction to elementary numerical methods and advanced FORTRAN programming with applications to chemical engineering problems. Structured software strategy. Approximations and errors introduced in computations. Systems of linear equations and ordinary differential equations, root finding, finite difference, least square and spline fits. Concepts of mathematical modeling, material and energy balances of single and staged unit operations with applications to design problems. *Prerequisites: admission to the major and grades of C- or better in AMES 10, AMES 111, and Math. 2EA. Department stamp required for enrollment. (S)*

**154. Advanced FORTRAN Programming for Engineers (4)**

Review of FORTRAN 77, VAX command and editing, and good programming practices. Program construction at various levels of complexity beyond that of AMES 10, use of variables of all types, and library programs. Applications to illustrate engineering problems. *Prerequisites: admission to the major and grades of C or better in AMES 10 and Math. 2EA. Department stamp required for enrollment. (Students may not receive credit for both AMES 154 and Math. 74.) (F,W)*

**156A-B. Mechanical Engineering Design I, II (4-4)**

Fundamental principles of mechanical design. Application of engineering mechanics to the design of mechanical components. Design project involving a preliminary design for a realistic engineering application. *(Priority enrollment given to mechanical engineering and engineering science majors.) Prerequisites: grades of C or better in AMES 11 or 102, 121A-B, 130A-B, and 154. Enrollment in 156B requires grade of C or better in 156A. Department stamp required for enrollment. (F,W)*

**158. Computer-Aided Analysis and Design (4)**

The use of computers for the design and analysis of engineering systems. *Prerequisites: grade of C or better in AMES 101A or 103A, 130B or 181, and 154. Department stamp required for enrollment. (W,S)*

**162A. Probability, Random Processes for Engineering (4)**

Introduction to probability theory. Random variables, conditional and unconditional distribution functions, characteristic functions, moments, transformation of random variables. Sequences of random variables, convergence. *Prerequisite: Grade of C or better in AMES 163B. Department stamp required for enrollment. (F)*

**162B. Probability, Random Processes for Engineering (4)**

Random processes. Stationary processes: correlation, power spectral density. Gaussian processes and linear transformations of Gaussian processes. Point processes. Sampling theory. Markov processes. *Prerequisite: grade of C or better in AMES 162A. Department stamp required for enrollment. (W)*

**162C. Kalman and Wiener Filtering (4)**

Minimum and linear mean square estimators and their properties. Orthogonality principle, design and experiments (computer simulations) with linear estimators, discrete time Kalman filters (KF) and applications, steady state KF, design and experiments with Kalman filters, KF based on continuous time state and discrete measurement model, continuous time KF, Wiener filtering and relationship to Kalman filtering. *Prerequisite: Grades of C or better in AMES 162A and AMES 162B. Department stamp required for enrollment. (S)*

**163A. Linear Circuits (4)**

Lumped circuits, Kirchhoff's laws, circuit elements, first and second order circuits, steady-state sinusoidal response; computational topics. *Prerequisites: admission to the major and grades of C or better in Math. 2DA-2EA and Phys. 2A-B-C. Department stamp required for enrollment. (F,W)*

**163B. Linear Systems (4)**

Continuous-time and discrete-time signals and systems. Fourier analysis of periodic and aperiodic signals. The Fourier transform. Convolution. Frequency response. Solution of constant-coefficient linear differential equations by



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Laplace transforms. Difference equations. *Prerequisites:* grades of C or better in Math. 2EA and AMES 163A. *Department stamp required for enrollment.* (W)

### 170. Experimental Techniques (4)

Principles and practice of measurement and control and the design and conduct of experiments. Technical report writing. Lectures relate to dimensional analysis, error analysis, signal-to-noise problems, filtering, data acquisition and data reduction, as well as background of experiments and statistical analysis. Experiments relate to the use of electronic devices and sensors. *Prerequisites:* grade of C or better in AMES 163A, and junior standing in major, and completion of all lower-division physics and chemistry labs required for each AMES major. *Department stamp required for enrollment.* (S)

### 171A-B. Mechanical Engineering Laboratory (4-4)

Design and analysis of experiments in fluid and solid mechanics using large facilities, e.g., pipe flow systems, wind tunnels, water channels, vibration table, testing machines. Students operate facilities, obtain data, complete engineering analysis, and write major reports. (*Priority enrollment given to mechanical engineering, engineering science, and applied mechanics majors.*) *Prerequisites:* grade of C or better in AMES 170 and senior standing in major. *Enrollment in 171B requires grade of C or better in 171A. Department stamp required for enrollment.* (F,W)

### 173. Structures and Materials Laboratory (4)

Laboratory course in which students design, build/implement, and conduct independent experimental projects involving structural materials and/or structural systems. Analytical predictions, evaluations and correlation studies of experimental results are required in the form of a detailed engineering report. An integral part of this laboratory course is exposure to and discussions of ongoing large- or full-scale structural research projects in the Charles Lee Powell Structural Systems Laboratory. (*Priority enrollment given to structural engineering majors.*) *Prerequisites:* grade of C- or better in AMES 170 and senior standing in the major. *Department stamp required for enrollment.* (W)

### 174. Bioengineering Laboratory (4)

A laboratory course which demonstrates basic concepts of bioengineering design through experimental procedures involving humans and experimental animals. Statistical principles of experimental design. Study of possible errors. Experiments include nerve action, electrocardiography, mechanics of muscle, membranes, and noninvasive diagnostics in humans. (*Priority enrollment given to bioengineering majors.*) *Prerequisites:* grade of C or better in AMES 170 and senior standing in major. *Department stamp required for enrollment.* (S)

### 176A-B. Chemical Engineering Process Laboratory (4-4)

Laboratory projects in the areas of applied chemical research and unit operations. Emphasis on applications of engineering concepts and fundamentals to solution of practical and research problems. Training in planning research projects, execution of experimental work, and articulation (both oral and written) of the research plan and results in the areas of applied chemical technology and engineering operations related to mass, momentum, and heat transfer. *Prerequisites:* 176A requires grades of C or better in AMES 112, 113A, and 170; 176B requires grade of C or better in 176A. *Department stamp required for enrollment.* (W,S)

### 177A. Microprocessor Control Laboratory (4)

Project based design course in which a microprocessor controls a dynamic electromechanical device in real time (including sensing, software, and actuation). Groups or pairs of students propose, design, build and debug project, which must function in real time by the last day of instruction. Involves fifteen hours per week in laboratory (twenty-four hour access for enrolled students). (*Priority enrollment given to systems and control engineering majors.*) *Prerequisites:* grades of C or better in AMES 170, AMES 141A and concurrent registration of AMES 141B or consent of the instructor. *Department stamp required for enrollment.* (W)

### 177B. Microprocessor Control Laboratory

Design development course. Students who have completed 177A redesign their projects to make them meet tighter specifications. Students work closely with systems faculty to identify flaws in their design and eliminate them. Extensive computer design evaluations are required. More complex control systems typically evolve to increase the accuracy, speed and robustness of the designs. *Prerequisite:* Grade of C or better in AMES 177A. *Department stamp required for enrollment.* (S)

### 181. Continuum Mechanics (4)

An introduction to continuum mechanics of both living and nonliving bodies. The laws of motion and free-body diagrams. Stresses. Deformation. Compatibility conditions. Constitutive equations. Properties of common fluids and solids. Derivation of field equations and boundary conditions. Applications to bioengineering design. *Prerequisites:* admission to the major and grades of C or better in Phys. 2A-B-C or Phys. 3A-B-C. *Department stamp required for enrollment.* (F)

### 182A. Biomechanics (4)

Introduction to physiological systems with emphasis on structure and function of major tissues and organs. Application of mechanics to understand the behavior of these tissues and organs at gross and microscopic levels. Design of surgical procedures and prosthetic devices. *Prerequisite:* grade of C or better in AMES 181. *Department stamp required for enrollment.* (W)

### 182B. Biomechanics (4)

Bioviscoelastic fluids and solids. Non-Newtonian behavior of blood, synovial fluid, mucus, and protoplasm. Basic mechanical properties of collagen and elastin, bone, cartilage, muscles, blood vessels, and other living tissues. Application of continuum mechanics at great depth. Artificial implantable materials and design of prosthetic devices. *Prerequisite:* grade of C or better in AMES 182A. *Department stamp required for enrollment.* (S)

### 183. Biomedical Electronics and Electrical Engineering (4)

Passive and active circuits. Semiconductors. Operational amplifiers. Nonlinear devices. Signals in continuous and discrete time systems. Modulation. Digital signal processing. Sampling. Noise. Digital filters. Computer design and use for biomedical instrumentation. Measurements and signal analysis in biological systems and medicine. *Prerequisites:* admission to the major and grade of C- or better in AMES 163A. *Department stamp required for enrollment.* (S)

### 184A. Principles of Bioengineering Design I (4)

General principles of electronics related to biomedical instrumentation. Basic circuits. Specialized amplifiers. Electrocardiography. Ultrasonic instruments. Electrical safety hazards. (*Priority enrollment given to bioengineering and systems science majors.*) *Prerequisite:* grade of C or better in AMES 163A. *Department stamp required for enrollment.* (F)

### 184B. Principles of Bioengineering Design II (4)

Statistics applied to bioengineering design. Analytical approach to biological systems with emphasis on modeling, computer simulation. Biomedical problems will include fluid flow resistance, storage and compliance, use of transfer functions, impedance, various types of biological signals. *Prerequisites:* grade of C or better in AMES 184A and Math. 110 (or concurrent registration). *Department stamp required for enrollment.* (W)

### 184C. Principles of Bioengineering Design III (4)

Biomaterials and artificial internal organs: an overview of the fundamentals of materials science as applied to medical engineering. Natural and synthetic polymers. Ceramics and metals. Phenomena occurring at the interface between implanted materials and the body. Illustration of these basic principles by examples from current research. *Prerequisites:* grades of C or better in AMES 184A-B. *Department stamp required for enrollment.* (S)

### 186. Bioengineering Design (4)

Preparation of formal engineering reports on a series of engineering analysis and design problems illustrating methodology from various branches of applied mechanics as applied to bioengineering problems. (*Priority enrollment given to bioengineering majors.*) *Prerequisites:* grades of C or better in AMES 103A-B, 121A-B, 130A, 154, 181, and Math. 110. *Department stamp required for enrollment.* (S)

### 190. Numerical Methods in Engineering Science (4)

Numerical methods with computer exercises from various branches of engineering science. Interpolation. Integration. Solution of systems of linear and nonlinear equations. Fast Fourier Transform. Solution of ordinary differential equations. Introduction to numerical partial differential equations. Convergence, stability, error estimation. *Prerequisites:* admission to the major and AMES 154 or equivalent. *Department stamp required for enrollment.* (F)

### 195. Teaching (1-4)

Teaching and tutorial assistance in an AMES course under

supervision of instructor. Not more than four units may be used to satisfy graduation requirements. (P/NP grades only.) *Prerequisite:* B average in major and consent of department chairman. (F,W,S)

### 197. Engineering Internship (1-4)

An enrichment program, available to a limited number of undergraduate and/or graduate students, which provides work experience with industry, government offices, hospitals and their practices. Subject to the availability of positions, students will work in a local industry or hospital (on a salaried or unsalaried basis) under the supervision of a faculty member and industrial supervisor. Coordination of the Engineering Internship is conducted through UCSD's Academic Internship Program. Time and effort to be arranged. Units may not be applied towards major graduation requirements unless prior approval of a faculty adviser is obtained and internship is an unsalaried position. *Prerequisites:* completion of ninety units with a 2.5 GPA and consent of AMES faculty coordinator. (F,W,S,S)

### 198. Directed Group Study (1-4)

Directed group study on a topic or in a field not included in the regular department curriculum, by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor. (F,W,S)

### 199. Independent Study for Undergraduates (4)

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor. (F,W,S)

## Graduate

### 205. Graduate Seminar (0)

Each graduate student in AMES is expected to attend a weekly seminar of his or her choice dealing with current topics in fluid mechanics, solid mechanics, bioengineering, systems science, applied ocean sciences, or energy. (S/U grades only.) (F,W,S)

### 206. Physical Principles and Problems (1)

Principles of applied science illustrated by problems in mechanics, dynamics, electricity, optics, thermodynamics, etc. Presentation of individual research. Preparation for interdepartment oral examination. (S/U grades only; course does not apply toward fulfillment of degree requirements.)

### 207. Topics in Engineering Science (4)

A course to be given at the discretion of the faculty in which topics of current interest in engineering will be presented. *Prerequisite:* consent of instructor.

### 210A-B-C. Fluid Mechanics (4-4-4)

Physical properties of fluids, kinematics; potential flow, wing theory; surface waves; Navier-Stokes equations; boundary layers; turbulence; heat and mass transfer. *Prerequisites:* AMES 101A-B and AMES 110, or consent of instructor.

### 211. Introduction to Combustion (4)

Fundamental aspects of flows of reactive gases, with emphasis on processes of combustion, including the relevant thermodynamics, chemical kinetics, fluid mechanics, and transport processes. Topics may include deflagrations, detonations, diffusion flames, ignition, extinction and propellant combustion. *Prerequisites:* AMES 101A-B-C or AMES 103A-B-C, AMES 110, or consent of instructor.

### 212. Introductory Compressible Flow (4)

Equations of motion for compressible fluids; one-dimensional gas dynamics and wave motion, waves in supersonic flow, including oblique shock waves; flow in ducts, nozzles, and wind tunnels; methods of characteristics. *Prerequisites:* AMES 101A-B-C or AMES 103A-B-C, AMES 110, or consent of instructor.

### 213. Mechanics of Propulsion (4)

Fluid mechanics, thermodynamics, and combustion processes involved in propulsion of aircraft and rockets by air breathing engines, and solid and liquid propellant rocket engines; characteristics and matching of engine components; diffusers, compressors, combustors, turbines, pumps, nozzles. *Prerequisites:* AMES 101A-B, AMES 110, or consent of instructor.

### 214A. Introduction to Turbulence and Turbulent Mixing (4)

Introductory concepts and definitions. Basic observations and experiments. Hydrodynamic stability. Kolmogoroff universal similarity hypotheses, length and time scales. Turbulent

transport. Reynolds equations. Reynolds analogy. Dynamics of turbulence, kinetic energy, vorticity, temperature variance conservation. *Prerequisites: AMES 101A-B-C or equivalent.*

**214B Introduction to Turbulence and Turbulent Mixing (4)**

Universal similarity hypotheses of turbulent mixing; length, time, and scalar scales. Phenomenology of free shear flows and wall bounded flows. Statistical description of turbulence; transport, spectral dynamics, statistical geometry. *Prerequisite: AMES 214A or equivalent, or consent of instructor.*

**220A. Statistical Thermodynamics (4)**

Fundamentals of statistical mechanics and statistical thermodynamics. Microstates and ensemble averaging. Classical and quantum statistics. The most probable distribution for systems in equilibrium. Derivation of thermodynamic functions. Planck's distribution law and black-body radiation. Chemical equilibrium. *Prerequisite: AMES 110.*

**220B-C. Kinetic Theory and Transport Phenomena (4-4)**

The distribution function in velocity space. The Maxwell-Boltzmann integro-differential equation. Moment equations and Navier-Stokes equations. The dynamics of molecular collisions. Boltzmann's H-theorem. Approximate methods of solution for small departures from an equilibrium state. The linear transport coefficients: viscosity, heat conduction, ordinary diffusion and thermal diffusion. Transport phenomena in weakly ionized gases and in highly ionized plasmas. Radiative heat transfer. Inelastic collisions. Chemical kinetics. *Prerequisites: AMES 101A-B-C or AMES 103A-B-C, 220A or consent of instructor.*

**221A-B-C. Heat and Mass Transfer (4-4-4)**

Conduction, convection, and radiation heat transfer and mass transfer. Development of energy and species conservation equations. Analytical and numerical solutions to transport problems. Specific topics and applications may vary according to interests of instructor. (*Not necessarily taught as a sequence nor offered every quarter.*) *Prerequisites: AMES 101A-B-C or AMES 103A-B-C, or consent of instructor.*

**222A-B-C. Advanced Fluid Mechanics (4-4-4)**

Contemporary problems in broad areas of fluid mechanics, e.g., turbulent flows, hydrodynamic stability, geophysical fluid dynamics, transport phenomena, acoustics, boundary layers, etc. (*Not necessarily taught as a sequence nor offered every quarter.*) *Prerequisites: AMES 210A-B-C or consent of instructor.*

**223. Computational Fluid Dynamics (4)**

Survey of numerical methods for fluid flow simulation with computer exercises. Emphasis varies with instructor. Ordinary differential equation models, e.g., boundary layer equations, Lorenz equations. Finite difference methods for simple wave equations. Spectral methods. Turbulence simulations. Vortex methods. Recent developments in CFD. *Prerequisite: AMES 101A or equivalent course. (W)*

**226A-B-C. Advanced Engineering Physics (4-4-4)**

Contemporary problems in many areas of engineering physics. Examples include combustion, quantitative spectroscopy and opacity calculations, relaxation phenomena and non-equilibrium flows, propagation of electromagnetic radiation through matter, laser theory and kinetics, advanced radiative heat transfer, laser-induced photochemistry, etc. *Prerequisites: AMES 220A-B-C, or consent of instructor.*

**230. Advanced Structural Analysis (4)**

Applications of advanced analytical concepts to structural engineering problems. The course is designed to show and emphasize the physical nature of the finite element method in structural engineering. Effects of approximations in the discretization and the type of finite elements under consideration are evaluated. An introduction is given to the nonlinear behavior of structural systems focusing on basic concepts and computational techniques. *Prerequisites: Courses in structural analysis and finite element theory such as AMES 132 and AMES 133 or equivalent. (F)*

**231A. Foundations of Solid Mechanics (4)**

Specification of stress and strain; infinitesimal and finite deformation; conservation equations; typical constitutive equations; minimum potential energy principle. *Prerequisite: AMES 130B or consent of instructor.*

**231B. Elasticity (4)**

Basic field equations. Typical boundary value problems of classical linear elasticity. Problems of plane stress and plane

strain. Variational principles. *Prerequisite: AMES 231A or consent of instructor.*

**231C. Anelasticity (4)**

Mechanical models of viscoelastic, plastic, and viscoplastic behavior in simple shear or uniaxial stress. Constitutive laws for three-dimensional states of stress and strain. Application to selected technological problems. *Prerequisite: AMES 231B or consent of instructor.*

**232. Finite-Element Methods in Solid Mechanics (4)**

Review of matrix analysis and variational principles. The use of finite element methods for problems in solid mechanics which involve material as well as geometrical non-linearities. Emphasis is placed on the inelastic deformation of materials. In addition to the quasi-static incremental theory of plasticity, attention is given to the slow transient phenomenon of viscoplasticity and also to dynamic transient problems. *Prerequisite: AMES 231A or consent of instructor.*

**233A. Mechanics of Composite Materials (4)**

Stiffness, strength, and thermal properties of particle and fiber-reinforced, as well as laminated composites; fracture, fatigue, and failure modes; damage theories and related special topics. *Prerequisites: AMES 231A-B-C or consent of instructor. (F)*

**233B. Micromechanics (4)**

General theory of transformation strains and corresponding elastic fields; Green's functions and other solution methods; dislocations; inclusions and inhomogeneities; micromechanics of plastic flow and micromechanically based plasticity theories; microcracking, cavitation, and damage in crystalline and other solids, and the corresponding overall response and failure modes; selected topics. *Prerequisites: AMES 231A-B-C or consent of instructor. (W)*

**233C. Fracture Mechanics (4)**

Theoretical strength; stress concentration. Linear fracture mechanics: stress singularity; fracture modes; stress field near a crack tip; energy method and energy release-rate; the J-integral. Nonlinear fracture mechanics: crack tip plastic zone; crack opening displacement; the Dugdale model; the R-curve, compliance method; the shape of plastic zone; power-law materials; the J-integral and the effective stress intensity factor: perfectly plastic solid; slip-line theory and stress field at crack tip; stability consideration. Fatigue; special topics. *Prerequisites: AMES 231A-B or consent of instructor. (S)*

**234. Experimental Mechanics (4)**

Theory and technique of standard and newly developed methods; laboratory experience using modern instrumentation such as strain gauges, capacitive, piezoelectric and piezoresistive devices, and surface coatings, application of photoelasticity, laser interferometry, and holography to problems in static and dynamic elasticity and plasticity. Ultra-high-speed measurements will be emphasized. *Prerequisite: consent of instructor.*

**235A-B. Theory of Shells (4-4)**

General mathematical formulation of the theory of thin elastic shells; linear membrane and bending theories; finite strain and rotation theories; shells of revolution; shallow shells; selected static and dynamic problems; survey of recent advances. *Prerequisites: AMES 130A-B-C or consent of instructor.*

**236. Structural Stability (4)**

Stability analysis of structural elements under steady, oscillatory, and impulsive loadings. Elastic and anelastic stability problems. *Prerequisite: AMES 130A-B-C or consent of instructor.*

**237. Structural Dynamics (4)**

Matrix analysis of the free and forced vibrations of discrete linear systems; response to periodic and transient excitations. Frequency response and generalized normal mode methods. Dynamics of continuous systems. *Prerequisites: AMES 231A-B or consent of instructor.*

**238. Stress Waves in Solids (4)**

Linear wave propagation; plane waves; reflection and refraction; dispersion induced by geometry and by material properties. Application of integral transform methods. Selected topics in nonlinear elastic, anelastic, and anisotropic wave propagation. *Prerequisites: AMES 231A-B-C or consent of instructor.*

**239. Earthquake Engineering (4)**

Introduction to plate tectonics and basic concepts in seismology including rupture mechanism, measures of magnitude and intensity, descriptions of earthquake occurrence and its relation to geologic and tectonic processes. Measurements and description of strong earthquake ground motion; site effects on ground motion. Response of structures to earthquake excitation; soil-structure interaction effects; full-scale testing of structures; design criteria and code requirements. *Prerequisites: AMES 231A-B, AMES 237 (or concurrent registration) or consent of instructor. (S)*

**240. Advanced Reinforced and Prestressed Concrete Design (4)**

Advanced topics in concrete design including frame and shear wall structures are discussed. Special emphasis is given to the design of connections and to confinement and ductility requirements under seismic loads. Complete reinforced and prestressed concrete systems are evaluated for seismic resistance. Upper and lower bound theories for slab design are derived. Analysis and design of circular prestressed concrete structures are discussed. *Prerequisite: AMES 135, AMES 136, or equivalent background in basic RC/PC design. (F)*

**241A-B-C. Linear and Nonlinear Systems (4-4-4)**

Linear spaces, equilibrium equations, linearization, contraction maps, state transition matrix, stability theory, controllability, observability and realizability, pole placement, observers, sensitivity analysis, singularly perturbed systems, nonlinear differential equations. Liapunov and Popov stability, describing functions, Krylov-Bogoliubov asymptotic method. *Prerequisites: AMES 141A-B and Math. 2EA.*

**242. Bridge Design (4)**

The course covers different aspects relevant to the design and the analysis of bridge structures. Construction methods and corresponding load conditions are investigated for various bridge types and geometries. Special problems in the analysis of box girder bridges, curved and skewed bridges and bridge structures under traffic loads, environmental, and seismic loads are discussed. Bearings and expansion joints are evaluated in connection with time and temperature dependent superstructure deformations. *Prerequisites: AMES 230 and fundamental courses in RC and PC design. (W)*

**246A-B-C. Optimal Control Theory (4-4-4)**

Linear vector spaces, Hilbert spaces, minimum norm problems, dual spaces, optimization of functionals, global and local theories; linear optimal control, controllability, sets of attainability, time-optimal control, integral cost criteria; Pontryagin maximum principle, singular control; game theory, matrix difference, differential games, pursuit-evasion, homicidal chauffeur. *Prerequisites: AMES 146A-B-C.*

**248A-B. Methods for Time Series Analysis (4-4)**

Discrete-time signals and linear systems; discrete, finite and fast Fourier transforms; digital filter design methods; effects of finite register length; harmonic analysis; stationary random processes; special representation; power spectrum estimators and their bias and consistency; cross spectral estimators; coherence and multiple coherence. *Prerequisites: AMES 162A-B-C.*

**251. Thermodynamics (4)**

Principles of thermodynamics of single and multicomponent systems. Phase equilibria. Estimation, calculation, and correlation of properties of liquids and gases. *Prerequisite: consent of instructor.*

**252. Chemical Reaction Engineering (4)**

Analysis of chemical rate processes; complex kinetic systems. Chemical reactor properties in steady state and transient operations; optimal design policies. The interaction of chemical and physical transport processes in affecting reactor design and operating characteristics. Uniqueness/multiplicity and stability in reactor systems. Applications of heterogeneous reactor systems. *Prerequisite: consent of instructor.*

**253. Heterogeneous Catalysis (4)**

Physics and chemistry of heterogeneous catalysis; adsorption/desorption kinetics, chemical bonding, isotherms, kinetic models, selection of catalysts, poisoning, experimental techniques. *Prerequisite: consent of instructor.*

**254. Biochemical Engineering Fundamentals (4)**

Introduction to microbiology as relevant to the main topic, biological reactor analysis. Fermentation and enzyme technology. *Prerequisite: consent of instructor.*



## COMPUTER SCIENCE AND ENGINEERING

### 255. Multiphase Transport Phenomena (4)

Fluid dynamics of particulate systems. Sedimentation and deformation of isolated particles. Bubble growth and dissolution; droplet evaporation. Combustion of drops and particles. Coagulation and coalescence. Capillary intrusion and immiscible displacement. *Prerequisite: consent of instructor.*

### 256. Rheology of Fluids (4)

Continuum mechanics of fluids; definition of material functions for viscous and viscoelastic liquids; principles of rheological measurement; relationship to molecular structure. *Prerequisite: consent of instructor.*

### 257A. Polymer Processing (4)

Analysis of flow fields encountered in major methods of polymer fabrication: extrusion, coating, fiber spinning, injection molding, mixing. *Prerequisite: consent of instructor.*

### 257B. Polymerization Reactor Design (4)

Modelling of various classes of polymerization. Reactor configurations. Influence of heat and mass transfer. Heterogeneous polymerization. Reactor dynamics and control. Optimization. *Prerequisite: grade of C or better in AMES 113 or consent of instructor.*

### 258. Special Topics in Chemical Engineering (4)

Directed study of some area of specialization not covered in depth in the regular course offerings. *Prerequisite: consent of instructor.*

### 259. Seminar in Chemical Engineering (1)

Presentations on research progress by graduate students and by visitors from industrial and academic research laboratories. (May be repeated for credit; S/U grades only; course does not apply toward fulfillment of degree requirements.) *Prerequisite: consent of instructor.*

### 262A-B-C. Stochastic Processes in Dynamic Systems (4-4-4)

Second order stochastic processes, stochastic integrals and stochastic differential equations, diffusion equations, linear and nonlinear estimation and detection, random fields, optimization of stochastic dynamic systems, applications of stochastic optimization to problems. *Prerequisites: AMES 162A-B-C.*

### 264A-B-C. Estimation and System Identification (4-4-4)

Parameter estimation, least-squares, bias consistency, efficiency, mean-square and maximum likelihood estimators, numerical solutions for estimates; estimators for linear dynamic systems. Wiener filter and Wiener-Hopf equation, Kalman filter, Riccati equation, filter stability, smoothing, extended Kalman filter, divergence and divergence control, system identification methods, ARMA and transfer function identification, input signal synthesis, Akaike's criterion. *Prerequisites: AMES 162A-B-C.*

### 271A. Structure and Function of Tissue (4)

A general survey will include samples of structure-function relationships at the cell and tissue level. Emphasis will be placed on components of the vascular system and related structures such as endothelium, erythrocytes, leucocytes, cardiac, smooth and skeletal muscle, connective tissue, basement membranes, and peripheral nerve cells. *Prerequisites: Biology 151 and 153 or equivalent, or consent of instructor.*

### 271B. Cardiovascular Physiology (4)

Physical concepts of behavior of heart, large blood vessels, vascular beds in major organs and the microcirculation. Included will be the physical and physiological principles of blood flow, blood pressure, cardiac work, electrophysiology of the heart, descriptions of special vascular beds including their biological and hemodynamic importance. Integration of separate components through nervous and humoral controls will be analyzed. *Prerequisites: Biology 151 and 153 or equivalent, or consent of instructor.*

### 271C. Respiratory and Renal Physiology (4)

Mechanics of breathing. Gas diffusion. Pulmonary blood flow. Stress distribution. Gas transport by blood. Kinetics of O<sub>2</sub> and CO<sub>2</sub> exchange. VA/Q relations. Control of ventilation. Glomerular and proximal tubule functions. Water metabolism. Control of Na and K in kidney. *Prerequisites: Biology 151 and 153 or equivalent, or consent of instructor.*

### 272. Biomechanics and Transport Phenomena (4)

An introduction to biomechanics and transport phenomena in biological systems at the graduate level. Biorheology,

bioviscoelastic fluids and solids, muscle mechanics, mass transfer, momentum transfer, energy transfer. The courses 272, 273, 278 form a core sequence in bioengineering. *Prerequisites: AMES 103B, 181, 182B, or equivalent.*

### 273. Transport Phenomena in Membranes (4)

Nonequilibrium thermodynamic analysis of transport phenomena. The osmotic effect. Diffusion and exchange in biological systems. *Prerequisite: AMES 272.*

### 276. Laboratory Projects in Bioengineering (4)

Theory of statistical inference, analysis, and design of experiments, data handling by digital computers, video tape recording, etc. Theory and application of optical and electronic instrumentation. The course will consist of lectures, conferences, and demonstrations, as well as the student's own selected laboratory project for study in depth. *Prerequisite: consent of instructor.*

### 277. Microcirculation in Health and Disease (4)

Structural and functional aspects of transport and blood-tissue exchange in key organs during states such as circulatory shock, bacterial toxemia, hypertension. Also physical and ultrastructural techniques used to analyze small vessel dynamics. *Prerequisite: consent of instructor.*

### 278A. Advanced Biomechanics (4)

Modern development of biomechanics at an advanced mathematical level. Selected topics in the dynamics of heart, pulsatile, blood flow, microcirculation, and muscle mechanics. *Prerequisite: AMES 272 or equivalent.*

### 278B. Biodynamics: Flow, Motion, and Stress (4)

Stress distribution in organs. Body dynamics. Fluid movement. Flying and swimming. Growth and change. Strength and tolerance. Trauma and design for safety. *Prerequisite: AMES 272 or equivalent.*

### 279. Selected Topics in Biophysics (4)

Selected topics in biophysics with emphasis on the structure and function of biological membrane, fluid and ion transport, excited states, wave propagation, muscle contraction, chemotaxis, chemical sensors, enzyme probes, swimming, and flying. *Prerequisites: AMES 272, 273.*

### 281. Seminar in Bioengineering (1)

The course involves weekly seminars given by faculty, visitors, postdoctoral research fellows, and graduate students concerning research topics in bioengineering and related subjects. Students report their own research. May be repeated for credit. This course does not apply toward the M.S. graduation requirements. (S/U grades only.)

### 290. Numerical Methods in Engineering Science (4)

Numerical methods with computer exercises from various branches of engineering science. Interpolation. Integration. Solution of systems of linear and nonlinear equations. Fast Fourier transform. Solution of ordinary differential equations. Introduction to numerical partial differential equations. Convergence, stability, error estimation. *Prerequisite: AMES 154 or equivalent course. (F)*

### 291. Design and Mechanics in Computer Technology (4)

Design and mechanics problems inherent in computer peripherals such as disk files, tape drives, and printers. Formulation and solution of problems involving mechanics, fluid mechanics, and materials; Reynolds equation, slider bearings; friction and wear; surface roughness; vibrations of rotating disks; introduction to actuator design, dimensional stability of substrate; instrumentation; experimental methods; impact printing; fluid jets; silicon micromechanics. *Prerequisite: consent of instructor. (S)*

### 294A-B-C. Methods in Applied Mechanics, I, II, III (4-4-4)

Various methods of analysis are covered with emphasis on application. Topics range over the broad fields of complex analysis, ordinary and partial differential equations (linear and nonlinear), asymptotic analysis, integral equations and weighted residuals. Specifics include Dirichlet and Neumann problems. Cauchy concepts. Green functions, Riemann mapping, eigenfunctions, phase-plane analysis, steepest descents, multiple scales. WKB method, matched asymptotic expansions, transform techniques, Fredholm theory. Wiener-Hopf method. Galerkin method. *Prerequisites: Math. 110, Math. 120A.*

### 296. Independent Study (4)

*Prerequisite: consent of instructor.*

### 297. Research Techniques (1-6)

A course designed to present the techniques of research through organized lectures, special assignments, and instruction on the techniques of selected research projects. *Prerequisite: consent of instructor. (S/U grades permitted.)*

### 298. Directed Group Study (1-4)

Directed group study on a topic or in a field not included in regular department curriculum, by special arrangement with a faculty member. *Prerequisite: consent of instructor. (S/U grades permitted.)*

### 299. Graduate Research (1-12)

(S/U grades only.)

## COMPUTER SCIENCE AND ENGINEERING (CSE)

OFFICE: 3216 Applied Physics and Mathematics Building, Muir College

### Professors:

Kenneth L. Bowles, Ph.D.

(Professor Emeritus)

Walter A. Burkhard, Ph.D., *Chairman*

William E. Howden, Ph.D.

T. C. Hu, Ph.D.

Walter J. Savitch, Ph.D.

### Associate Professors:

Francine D. Berman, Ph.D.

Patrick Dymond, Ph.D.

### Assistant Professors:

Richard K. Belew, Ph.D.

Laurette Bradley, Ph.D.

Chung-Kuan Cheng, Ph.D.

Alex Orailoglu, Ph.D.

Olaf Owe, Ph.D.

Jehan-Francois Paris, Ph.D.

Ramamohan Paturi, Ph.D.

Augustus K. Uht, Ph.D., P.E.

Victor Vianu, Ph.D.

### Adjunct Professor:

Sidney Karin, Ph.D.

## The Major Programs for Undergraduates

The department offers four-year programs in computer science and computer engineering. These programs, which lead to the B.S. degree, prepare students for employment in computer industries, and for graduate work in these fields. In addition, the department offers a program leading to the B.A. degree in computer science. This is intended for students desiring more time for undergraduate studies outside their major subject. It prepares students for graduate study in their respective fields, as well as for certain types of employment.

To graduate in four years with a B.S. in computer science or computer engineering, a student without advanced standing

should enroll for approximately eighteen units for three quarters and sixteen units during other quarters (or attend some summer quarters).

A grade-point average of 2.0 will be required in upper-division courses in the major, including technical electives. Admission to CSE majors is based on GPA in required lower-division courses.

A total of at most four units of CSE 197, 198, and 199 may be applied in fulfilling the requirements for a major program in the Department of Computer Science and Engineering. These must be taken on a Pass/No Pass basis.

Students enrolled in the departmental programs who maintain a distinguished scholastic record through their junior year are encouraged to apply for the five-year B.S.-B.A./M.S. program. Applications for admission to the graduate program may be made in the spring quarter of the junior year. In their senior year such students may enroll in graduate courses and can complete the requirements for the master's degree within one year after receiving the bachelor's degree. If the student's eventual aim is to take a Ph.D., he or she will be able to begin research earlier and spend a shorter time in completing the degree. The student's choice of electives must be discussed with his or her adviser.

## **The B.S. Curricula**

### **Computer Science**

The computer science program offers a strong emphasis on engineering mathematics, basic engineering science, and software. Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter. Courses in high school physics and computer programming, although helpful, are not required for admission to the program.

The required lower-division courses are:

1. Math. 2A-2B-2C, 2D or 2DA, 2E or 2EA, 2F
2. Phys. 2A-2B-2C-2D  
Math. 2A is prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and physics in high school may substitute the honors

sequence Phys. 3A-3B-3C-3D for Phys. 2A-2B-2C-2D.

3. Phys. 2AL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 3 sequences.
4. CSE 65 or 62B, 64, and 70
5. ECE 50A-50B-50C and 52AL-52BL-52CL.
6. Chem. 6A-6B or Chem. 7A-7B. A lower-division course in biology may be substituted for Chem. 6B or Chem. 7B.

The required upper-division courses are Math. 183 (to be taken in sophomore year), and:

#### **Junior Year**

- (a) CSE 160A-B
- (b) CSE 161A-B
- (c) CSE 163A-B
- (d) CSE 173,179
- (e) technical elective (twelve units)

#### **Senior Year**

- (a) CSE 170A-B
- (b) CSE 171A-B
- (c) CSE 165
- (d) CSE 175B-C
- (e) technical elective (twelve units)

#### **Electives**

- ECE 105A-B-C
- ECE 131A-B-C
- ECE 132
- ECE 136A-B
- ECE 140A-B-C
- ECE 141A-B-C
- ECE 146A-B-C
- ECE 152A-B-C
- ECE 154A-B-C
- ECE 159A-B-C
- CSE 162
- CSE 176
- CSE 177
- CSE 178A-B
- CSE 180
- CSE 197
- CSE 198
- CSE 199
- AMES 141A-B-C
- Math. 102
- Math. 160A-B
- Math. 170A-B-C
- Math. 171A-B
- Math. 172
- Math. 173
- Math. 180A-B-C
- Math. 181A-B

### **Computer Engineering**

Students wishing to take the computer engineering curriculum must be admitted to either the ECE or CSE department. The

set of required courses and allowed electives is the same in both departments.

The computer engineering program offers a strong emphasis on engineering mathematics and other basic engineering science as well as a firm grounding in computer science. Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter. Courses in high-school physics and computer programming, although helpful, are not required for admission to the program.

The required lower-division courses are:

1. Math. 2A-2B-2C, 2D or 2DA, 2E or 2EA, 2F
2. Phys. 2A-2B-2C-2D. Math. 2A is prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and physics in high school may substitute the honors sequence Phys. 3A-3B-3C-3D for Phys. 2A-2B-2C-2D.
3. Phys. 2AL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 3 sequences.
4. CSE 64, 65, and 70.
5. 50A-50B-50C and 52AL-52BL-52CL.
6. Chem. 6A-6B or Chem. 7A-7B. A lower-division course in biology may be substituted for Chem. 6B or Chem. 7B.

The required upper-division courses are:

#### **Junior Year**

- (a) ECE 105A
- (b) ECE 152A-B
- (c) CSE 160A-B
- (d) CSE 161A-B
- (e) CSE 170A-B
- (f) CSE 175B
- (g) ECE 132
- (h) Technical elective (four units)

#### **Senior Year**

- (a) ECE 146B
- (b) ECE 147A-B
- (c) CSE 163A
- (d) CSE 171A-B
- (e) CSE 175C
- (f) CSE 180
- (g) Technical elective (four units)

## COMPUTER SCIENCE AND ENGINEERING

### Electives

Any upper-division ECE or CSE course not already listed as a core course is acceptable as a technical elective with the exception of ECE 138.

## The B.A. Curriculum

### Computer Science

The required lower-division courses are:

- (a) Math. 2A-2B-2C; Math. 2D-2E or 2DA-2EA
- (b) Phys. 2A-2B-2C
- (c) CSE 65 or 62B, CSE 70

A total of fifteen upper-division courses must be passed with a minimum grade-point average of 2.0 in order to satisfy the major requirements. The following eleven courses are required: CSE 160A-B; 161A-B, 163A-B, 165, 170A, 171A, 175B, 179.

Four electives should be chosen from the following list: ECE 132, 146A-B-C, 159A-B-C, CSE 162, 170B, 171B, 173, 175C, 176, 177, 178A-B, 180, 198, 199, Math. 160A-B, Math. 170A-B-C, 172, 173, Econ. 172A-B-C, Psych. 133.

Transfer students who have not completed lower-division requirements may have difficulty completing the B.A. program in four years.

### Minor Curricula

The following sets of courses represent a variety of minor curricula in computer science. The prerequisites for these minor curricula require certain other courses which must therefore be anticipated in the student's program. Revelle students should consult their provost's office concerning their noncontiguous minor.

Not all minor curricula are available to a student pursuing a CSE major curriculum. See the departmental office for a list of permissible minors.

Programs of concentration for Warren College should be selected from this list. Rules concerning overlap with the major curriculum are available from the Office of the Provost, Warren College.

#### Computer Hardware

CSE 65 or 62B, CSE 70, CSE 170A-B, CSE 175B-C

#### Computer Software

CSE 65 or 62B, CSE 70, CSE 161A, CSE 163A-B, CSE 173 or 171A

#### Computer Theory (seven courses required)

CSE 65 or 62B, CSE 70, CSE 160A, CSE 161A-B, CSE 165 and CSE 179

### Computing for Students in the Humanities and Social Sciences

An introduction to the structure and use of automatic digital computers is provided in CSE 62A and 62B (introduction to Programming I and II).

### Admission to Upper-Division Courses

The Department of Computer Science and Engineering will attempt to provide sufficient sections of all lower-division courses so that students who meet the prerequisites for a given course will be able to enroll. Students will, however, be screened to ensure that they meet all course prerequisites for these lower-division courses.

Admission to upper-division courses will be restricted to:

1. Students admitted by the department to a major or minor curriculum having completed lower-division requirements, and
2. Students fulfilling a requirement for another major.

Those students not in compliance with the above restrictions should be forewarned that they will automatically be dropped from course rosters (at any time during the quarter) when it comes to the attention of the department that a student is enrolled in a course without being eligible because the prerequisites and/or performance standards have not been met. Admission to all CSE courses will require the departmental stamp on the registration form, and it will be given only by the undergraduate affairs staff.

All students enrolled at UCSD and wishing to enter a departmental major or minor curriculum must submit an application in accordance with the policy set forth by the Division of Engineering (above) by the end of the second week of the spring quarter of the preceding year. Applications may be obtained from the Undergraduate Matters Office in Room 1782 Applied Physics and Mathematics Building. Incoming transfer students must submit their application prior to the start of the fall quarter. Transfer students who wish to enter a major curriculum directly must show evidence that they have completed equivalent prerequisite courses.

Because CSE is an overcrowded department, not all students who express an interest can be admitted.

The department will set an overall quota for admission to the major and minor curricula for the following academic year. It will be based upon:

1. Preregistration of students who have already completed upper-division CSE courses
2. Preregistration of students required to enroll in upper-division courses for major curricula offered by other departments
3. Estimates of the number of incoming transfer students who will be admitted to the major curricula, and
4. Class limits for upper-division courses.

### Transfer Students

Requirements for admission to upper-division courses and to the major curricula are the same for transfer students as for continuing students. When planning their program, students should be mindful of lower-division prerequisites necessary for admission to upper-division courses. Transfer students should be prepared to present the department a copy of their records for evaluation of eligibility prior to enrolling in CSE courses.

Students who wish to enter a major curriculum directly must make application to the department before the beginning of the fall quarter, submitting course descriptions and transcripts for courses used to satisfy their lower-division requirements. Although admission is not normally restricted to the fall quarter, transfer students entering in the winter or spring quarter should be aware that scheduling difficulties may occur because upper-division sequences normally begin in the fall quarter.

### The Graduate Program

This program accepts students with a B.A./B.S. in computer science or related areas as well as advanced graduate students for study and research leading to the degree of doctor of philosophy; the program also offers a master of science degree. The program is concerned with fundamental properties of digital information processing systems. Emphasis is placed on the design of computer systems, especially compilers, architecture, programming languages, operating systems, and the analysis of algorithms.

The M.S. degree (Plan II — Comprehensive Examination) is designed to serve as a master's degree for students who wish to seek immediate employment in the computer field. Although it is specifically designed to serve as a terminal program students who complete the program are in an excellent position to go on to study for the Ph.D. degree. Students with a good undergraduate background can

complete the M.S. program in one year of full-time study. Special provisions are made to integrate this program into a five-year combined bachelor-master's program.

### Five-Year Bachelor's-Master's Program

Students interested in the combined bachelor's-master's degree may start taking graduate classes in the senior year, with permission from the student's adviser. Graduate classes the student takes in the senior year cannot be counted towards the bachelor's degree as well as the M.S. degree. Students must apply for graduate study by regular application and meet the regular criteria for admission. Graduate Record Examination scores are required.

### Preparation

Applications will be considered from students who have taken undergraduate majors in applied mathematics or computer science. The application deadline is January 15. Fall admission only.

### Master's Degree Program

The general requirements for the degree of master of science are stated in the "Graduate Studies" section of the catalog. The department offers the master of science in computer science degree (Plan II only).

In order to receive the M.S. degree in computer science, a student must complete the course requirements listed below and pass a comprehensive examination. The examination consists of two parts. Part I of the examination can normally be passed with a thorough knowledge of the topics covered in an undergraduate computer science major. Part II of the examination covers more advanced graduate topics.

### Course Requirements

- (a) CSE 264A-B and either 264C or 264D
- (b) CSE 269 (4 units)
- (c) Two of the following three sequences
  - (i) CSE 270A-B
  - (ii) CSE 268A-B and either 268C or 268D
  - (iii) CSE 265A-B-C

All the above courses must be completed with a grade-point average of 3.0.

Additional graduate courses to complete a total of forty-eight units may be taken in CSE, mathematics, psychology, linguistics, and economics.

### The Doctoral Program

The department has established a set of requirements applying to the first two years of the Ph.D. program as described below. Ph.D. students are expected to maintain, on an annual basis, a 3.4 grade-point average for the core courses. They must pass a comprehensive examination.

In the second year graduate students are expected to devote at least half their time to research and must present the results of their research before a committee of three faculty members in a research examination.

Ph.D. students entering with a master's degree may petition for waiver of the core courses or for substitution of alternative courses. Students who have satisfied these departmental graduate requirements may register for any CSE course on a satisfactory/unsatisfactory basis.

1. Core Courses:  
CSE 264A-B-C-D  
CSE 265A-B-C, and three quarters chosen from:  
CSE 268A-B-C-D  
CSE 270A-B-C  
CSE 250A-B-C  
Math. 200A-B-C  
Math. 260A-B-C  
Math. 270A-B-C
2. Comprehensive Examination:  
Ph.D. students are required to take the same examination as the master's degree candidates, but must pass it with a higher level of performance than that required of master's candidates. Students are expected to take this examination after completing one year of graduate study at UCSD.

### Dissertation

In order to be admitted to the university qualifying examination, a student must have satisfied the departmental graduate requirements and have been accepted by a faculty member as a Ph.D. thesis candidate. A candidate for the Ph.D. will write a dissertation and defend it in a final oral examination conducted by the doctoral committee.

### Financial Aid

Financial support is available to qualified graduate students in the form of fellowships, loans, and assistantships. Anticipated stipends for half-time research assistantships are \$902 per month, with the possibility of full-time employment during the summer months. For a half-time teaching assistantship, the anticipated stipend will be \$1,163 per month. Requests

for application forms for admission and financial support should be directed to the Department of Computer Science and Engineering. The department generally offers support to graduate students in the Ph.D. program only.

### Courses

The department will endeavor to offer the courses as outlined below; however, unforeseen circumstances sometimes mandate a change of scheduled offerings. Students are strongly advised to check the *Schedule of Classes* or the department before relying on the schedule below.

The names appearing below the course descriptions are those of faculty members in charge of the courses. For the names of the instructors who will teach the courses, please refer to the quarterly *Schedule of Classes*. CSE 65 and CSE 62B are interchangeable as prerequisites for other courses.

### Lower Division

#### 60. The Language of the Computer (4)

(Formerly EECS 60.) (Same as Ling. 63.) This course will focus on differences between human and computer languages. Topics also include an overview of UNIX and the roles played by hardware and software. Students will learn to use editors, word-processing programs, utilities, and to write CSH scripts. This course has no prerequisite. (F) Staff

#### 62A. Introduction to Programming I (4)

(Formerly EECS 62A.) Teaches basic skills for using UNIX utilities to maintain files. Topics include the notion of files and directories, use of editors, electronic mail, and changing the user's environment by means of aliases and simple shell scripts. Introduction to algorithms and a top-down program design. Introduction to the PASCAL language. (F,W) Mr. Savitch

#### 62B. Introduction to Programming II (4)

(Formerly EECS 62B.) Hierarchical program structures, top-down and bottom-up testing techniques, use of assertions, introduction to data structures, simple analysis of round off error in real arithmetic. Completion of the PASCAL programming language, including records, files, and pointers. (A student may not receive credit for both CSE 65 and CSE 62B.) Prerequisites: Math. 1A and CSE 62A. (W,S) Mr. Savitch

#### 64. Scientific Application of Computers (4)

(Formerly EECS 64.) Introduction to elementary numerical analysis with emphasis on computer applications. Systems of linear equations, interpolation, extrapolation, polynomial fits to data, root finding, numerical differentiation and integration and FORTRAN programming. Three hours' lecture, two hours' recitation. The recitation sections will be divided into two sets, those which use FORTRAN as the course programming language and those which use PASCAL. Prerequisite: Math. 2B and CSE 62B or 65 or equivalent course emphasizing structured programming approved by the instructor. (S) Mr. Hu

#### 65. Introduction to Programming Techniques (4)

(Formerly EECS 65.) Basic design methods for effective programming, including the notion of an algorithm, hierarchical program structures, top-down and bottom-up testing techniques, use of assertions, introduction to data structures, simple analysis of round off error in real arithmetics. The PASCAL programming language, including records, files, and pointers. (A student may not receive credit for both CSE 65 and CSE 62B.) Prerequisite: Math. 2A (may be taken concurrently). (W,S) Mr. Savitch



## COMPUTER SCIENCE AND ENGINEERING

### 69. Computers and Society (4)

(Formerly EECS 69.) An introduction to computers, their applications, and their impact on people and social institutions. Factual and technical information for making objective judgments about computer use. Social problems created by the use of computers and tools for solving them. Constructive and creative thought about technology and its social impact. Three hours' lecture. This course has no prerequisite; it is based on the hypothesis that the computer affects all of us and is important for everyone to understand. Mr. Savitch

### 70. Introduction to Systems Programming (4)

(Formerly EECS 70.) Introduction to the fundamental physical and mathematical structures of computer software engineering. Topics include: machine structure and assembly language programming, program control structure, program data structure, and analysis of program correctness and performance. Three hours' lecture. *Prerequisite:* CSE 62B or 65, or consent of instructor. (F,W,S) Mr. Howden

## Upper Division

### 160A. Discrete Mathematics (4)

(Formerly EECS 160A.) Introduction to discrete structures and mathematical reasoning which will be useful in designing and analyzing algorithms. Topics include mathematical logic and methods of proof, natural numbers and mathematical induction, program verification; sets and operations on sets, basics of probability, inductive definition of sets, finite and infinite sets; relations and functions, equivalence relations and partitions, order relations; and basic abstract algebra. Three hours' lecture. (F) Mr. Hu

### 160B. Combinatorics and Graph Theory (4)

(Formerly EECS 160B.) Introduction to combinatorial reasoning and graph theory. Topics include basic counting principles, permutations and combinations, binomial coefficients, more on probability; recurrence relations; generating functions; inclusion-exclusion principle; analysis of algorithms; introduction to graph theory with a selection of topics from trees, paths, connectivity, planarity, coloring, and matching. Three hours' lecture. *Prerequisite:* CSE 160A. (W) Mr. Hu

### 161A. Data Structures I (4)

(Formerly EECS 161A.) Principles of data types and structures, linear lists, recursion, hashing, tree structures, runtime analysis. *Prerequisites:* CSE 62B or 65, CSE 70. (F) Mr. Burkhard

### 161B. Data Structures II (4)

(Formerly EECS 161B.) Static and dynamic structures, files, secondary storage models, searching. *Prerequisites:* CSE 161A or equivalent, CSE 160A or equivalent. (W) Mr. Burkhard

### 162. Programming Languages for Artificial Intelligence (4)

(Formerly EECS 162.) Experience using LISP, PROLOG, and an object-based language to solve typical problems from artificial intelligence (AI). Relative advantages and disadvantages of these languages, and considerations for selecting a language for a particular problem will be discussed. *Prerequisite:* CSE 161A. (F) Mr. Savitch

### 163A-B. Compiler Construction (4-4)

(Formerly EECS 163A-B.) Principles and practice of constructing translators for programming languages, compiling, lexical analysis, syntactic analysis, context-free grammars, symbol tables, syntax-directed translation, optimization, automatic generation of lexical and syntactic analyzers. *Prerequisite:* CSE 161A. (W,S) Ms. Bradley

### 165. Algorithms, Automata, and Formal Languages (4)

(Formerly EECS 165.) Automata theory: finite state machines, pushdown automata, Turing machines, computability. Formal language theory. Three hours' lecture. *Prerequisites:* CSE 163A and CSE 160A. (A student may not receive credit for both CSE 165 and Math. 166.) (F,W) Mr. Savitch

### 170A. Introduction to Digital Logic (4)

(Formerly EECS 170A.) Number systems: data representation and coding. Combinational logic design: Boolean algebra, switching functions, gates, canonical forms, minimization techniques (algebraic, Karnaugh maps), metrics, universal module sets, bilateral switch networks (VLSI logic circuits), combinational building blocks (MUXs, decoders, ROMs, PLAs), adders, carry lookahead circuits, Shannon's expansion theorem, nontraditional implementations of com-

binational logic. Sequential logic design: state machines, flip-flops, timing, Mealy and Moore machines, analysis and synthesis of canonical forms, sequential building blocks, nontraditional approaches to state machine design. Three hours' lecture. *Prerequisite:* CSE 70 or consent of instructor. (W) Mr. Uht

### 170B. Introduction to Computer Architecture (4)

(Formerly EECS 170B.) Register-transfer language approach to sequential machine design. CPU organization. Instruction sets. Microprogrammed vs. hardwired control units. Busses. Memory elements and organization; the memory hierarchy. Input/output, interrupts. Computer arithmetic. Microprocessors. Three hours' lecture. *Prerequisite:* CSE 170A or consent of instructor. (S) Mr. Uht

### 171A-B. Principles of Computer Operating Systems (4-4)

(Formerly EECS 171A-B.) Batch systems, multiprogramming, procedure implementation, processes, parallelism, critical sections, deadlocks, communication, multiprocessing, multi-level memory management, binding, name management, file systems, protection, resource allocation, scheduling. Three hours' lecture. *Prerequisites:* CSE 161A and 170A. (W,S) Mr. Howden

### 173. Comparative Study of Programming Languages (4)

(Formerly EECS 173.) Introduction to several high-level programming languages. Comparison of language features and analysis of language design. Courses will involve programming with each language studied (e.g., APL, LISP, and SNOBOL). Three hours' lecture. *Prerequisites:* 62B or 65, and CSE 70 or consent of instructor. (F,S; may be offered in W, please check with department.) Owe

### 175B. Digital Hardware Laboratory (4)

(Formerly EECS 175B.) Introduction to common digital integrated circuits: gates, memory circuits, MSI components. Operating characteristics, specifications, and applications. Design of simple combinational and sequential digital systems such as arithmetic processors, game-playing machines. Construction and debugging techniques. One hour's lecture, six hours' laboratory. (Students who have taken ECE 138 may not take CSE 175B for credit.) *Prerequisite:* CSE 70. CSE 170A recommended (may be taken concurrently) or consent of instructor. (F,W,S) Cheng

### 175C. Microprocessor Systems Design (4)

(Formerly EECS 175C.) Writing the debugging programs on a microprocessor development system. Timing and loading considerations in a system hardware design. A critical comparison of addressing models. I/O structures, interrupt capabilities, and direct memory access techniques. Two hours' lecture, four hours' laboratory. *Prerequisites:* CSE 170B (may be taken concurrently), CSE 70 or equivalent, and CSE 175B or equivalent. (F,W,S) Mr. Burkhard

### 176. Database System Principles (4)

(Formerly EECS 176.) Introduction to database system architecture. Principles of access methods and files, data models including hierarchical, network, and relational, data definition, manipulation, and query languages, data dependencies, transactions, concurrency, and recovery. Three hours' lecture. *Prerequisite:* CSE 161B. (S) Mr. Vianu

### 177. Computer Graphics (4)

(Formerly EECS 177.) Representation of pictorial data. Two-dimensional and three-dimensional transformations and perspective curves, surfaces, and shading. Graphic I/O devices: raster, vector and storage displays. Graphics software and applications. Three hours' lecture, six hours' laboratory. *Prerequisites:* CSE 161A-B and CSE 170A. (W) Staff

### 178A. Artificial Intelligence I (4)

(Formerly EECS 178A.) The first quarter of a two-quarter undergraduate sequence surveying artificial intelligence. Knowledge representation techniques based on logic, semantic networks, and production systems will be the focus of this course. Theorem proving will also be considered. Assignments will require programming in LISP and PROLOG. *Prerequisites:* CSE 162, CSE 160A, and CSE 161A. (W) Mr. Belew

### 178B. Artificial Intelligence II (4)

(Formerly EECS 178B.) Heuristic search of problem state spaces, planning and problem-solving techniques will be considered. Applications in natural language and vision, the expert systems methodology, and topics from machine learning and cognitive science will also be mentioned. *Prerequisite:* CSE 178A. (S) Mr. Belew

### 179. Analysis of Algorithms (4)

(Formerly EECS 179.) Methods for designing analyzing computer algorithms. Definition of a model of computational cost and analysis within the model of algorithms including sorting, graph algorithms, and others. Introduction to the theory of NP-completeness. Three hours' lecture. *Prerequisites:* CSE 160A-B and 161A-B. (W,S) Ms. Berman

### 180. Software Engineering (4)

(Formerly EECS 180.) Different aspects of software engineering will be studied. Topics include design methods, requirements and specification, validation and program testing, maintenance, and programming methodology. Three hours' lecture. *Prerequisites:* CSE 161A-B, CSE 171A, and CSE 163A. (S) Mr. Howden

### 195. Teaching (2 or 4)

(Formerly EECS 195.) Teaching and tutorial activities associated with courses and seminars. Not more than four units of CSE 195 may be used for satisfying graduation requirements. (P/NP grades only.) Three hours' lecture. *Prerequisite:* consent of the department chairman.

### 197. Field Study in Computer Sciences (4, 8, 12, or 16)

(Formerly EECS 197.) Directed study and research at laboratories away from the campus. (P/NP grades only.) *Prerequisites:* consent of instructor and approval of the department.

### 198. Directed Group Study (2 or 4)

(Formerly EECS 198.) Topics in computer sciences involves reading and discussion by a small group of students under direction of a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor.

### 199. Independent Study for Undergraduates (2 or 4)

(Formerly EECS 199.) Independent reading or research by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor.

## Graduate

### 264A. Software Engineering (4)

(Formerly EECS 264A.) General principles in modern software engineering. Both theoretical and practical topics are covered. Theoretical topics include proofs of correctness, programming language semantics and theory of testing. Practical topics include structured programming, modularization techniques, design of languages for reliable programming and software tools. *Prerequisites:* CSE 161A-B, 163A, 171A, or consent of instructor. (F) Mr. Howden

### 264B. Advanced Operating Systems (4)

(Formerly EECS 264B.) Software engineering principles and techniques which are specifically related to the design and implementation of operating systems. Topics include cooperating sequential processes, resource protection, recoverability, and systems programming language. *Prerequisites:* CSE 171A-B or consent of instructor. (W) Mr. Howden

### 264C. Advanced Compiler Design (4)

(Formerly EECS 264C.) Advanced material in programming languages and translator systems. Topics include compilers, code optimization, and debugging interpreters. *Prerequisites:* CSE 161A-B, 163A-B, or consent of instructor. (S) Mr. Howden

### 264D. Database Systems (3)

(Formerly EECS 264D.) Database models including relational, hierarchic, and network approaches. Implementation of databases including query languages and system architectures. *Prerequisites:* CSE 161A-B or consent of instructor. (S) Mr. Burkhard

### 265A-B-C. Automata, Formal Language, and Complexity Theory (4-4-4)

(Formerly EECS 265A-B-C.) Finite-state machines; context-free languages, pushdown automata, parsing theory; Turing and register type machines, halting problem, time and tape complexity; Blum axioms; analysis of the computational cost of specific tasks such as sorting, matrix manipulation, and polynomial evaluation. *Prerequisite:* consent of instructor. (F,W,S) Mr. Dymond

### 268A. Combinatorial Algorithms (4)

(Formerly EECS 268A.) This course presents combinatorial algorithms commonly used in computer science. These algorithms include shortest paths, maximum flow, multi-terminal maximum flows, PERT network, dynamic programming, backtrack, binary trees, greedy algorithms, and matrix computation. *Prerequisite:* consent of instructor. (F) Mr. Hu



**268B. Mathematical Programming (4)**

(Formerly EECS 268B.) Convex function, separating hyperplanes. Linear programming, simplex method, quality complementary slackness. Revised simplex method, column-generating techniques in LP. Integer programming. *Prerequisite: consent of instructor.* (W) Mr. Hu

**268C. Advanced Data Structures (4)**

(Formerly EECS 268C.) Self-adjusting structures, hashing, priority queues, and geometrical search algorithms. *Prerequisite: consent of instructor.* Mr. Burkhard

**268D. Applications of Combinatorial Algorithms (4)**

(Formerly EECS 268D.) Description of models in VLSI design. Current literature in CAD. Applications of combinatorial algorithms and mathematical programming techniques to circuit layout. Array computation, etc. *Prerequisite: consent of instructor.* (S) Mr. Hu

**269. Special Project in Computer Science (1-8)**

(Formerly EECS 269.) The student will conceive, design, and execute a project in computer science under the direction of a faculty member. The project will typically include a large programming or hardware design task but other types of projects are possible. One—six units may be repeated to a total of nine units. *Prerequisite: admission to the M.S. program in computer science.* (S/U grades only.) Mr. Savitch

**270A. Concepts in Computer Architecture, Part 1 (4)**

(Formerly EECS 270A.) Conventional level machines. Architectural description tools, performance evaluation, machine classifications, von Neumann machines, semantic dependencies, I-unit and E-unit concepts, RISC/CISC issues, bottlenecks, virtual memory, memory bandwidth issues, I/O channels and processors, micro- and nano-programming, virtual machines, high-level language machines and issues. Low- and micro-level performance enhancements: pipelining, instruction lookahead, branch prediction, reduction of semantic dependencies. Alternative conventional level machines: dataflow concepts, associative memories and machines. Three hours' lecture. *Prerequisite: CSE 170B or consent of instructor.* (F) Mr. Uht

**270B. Concepts in Computer Architecture, Part 2 (4)**

(Formerly EECS 270B.) Parallel systems: attached processors, vector supercomputers, SIMD machines, MIMD machines, degrees of coupling, interconnection networks, memory issues, systolic arrays. Networks and distributed systems: the ISO model, network topologies, the hardware layers. Three hours' lecture. *Prerequisite: CSE 270A or consent of instructor.* (W) Mr. Uht

**278A. Advanced Artificial Intelligence I (4)**

(Formerly EECS 278A.) Issues in knowledge representation (using logic, semantic networks, production systems, and connectionist representations) will be the focus of this course. A discussion of logic programming languages (like PROLOG) and automatic theorem proving will then lead to a discussion of heuristic search. *Prerequisite: CSE 178B or equivalent.* (F) Mr. Belew

**278B. Advanced Artificial Intelligence II (4)**

(Formerly EECS 278B.) This course will discuss knowledge representations used to search for solutions, make deductions, plan, and problem solve. The application of these techniques to "expert systems" will be mentioned. Machine learning will also be a major topic of this course. *Prerequisite: CSE 278A.* (W) Mr. Belew

**280. Special Studies in Computer Science (1-4)**

(Formerly EECS 280.) Topics of special interest in computer science. Subject matter to be announced before each quarter. May be repeated for credit. (S/U grades only.) *Prerequisite: consent of instructor.*

**281. Special Topics in Computer Science (1-8)**

(Formerly EECS 281.) A course to be given at the discretion of the faculty at which topics of current interest in computer science will be presented by visiting or resident faculty members. May be repeated for credit. (S/U grades only.) *Prerequisite: consent of instructor.*

**298. Independent Study (1-16)**

(Formerly EECS 298.) Open to properly qualified graduate students who wish to pursue a problem through advanced study under the direction of a member of the staff. (S/U grades only.) *Prerequisite: consent of instructor.*

**299. Research (1-16)**

(Formerly EECS 299.) *Prerequisite: consent of instructor.* (S/U grades only.)

**501. Teaching (1-16)**

(Formerly EECS 501.) Teaching and tutorial activities associated with courses and seminars. Not required for candidates for the Ph.D. degree. Number of units for credit depends on number of hours devoted to class or section assistance. (S/U grades only.) *Prerequisite: consent of department chairman.*

## ELECTRICAL AND COMPUTER ENGINEERING (ECE)

OFFICE: 3216 Applied Physics and  
Mathematics Building, Muir College

**Professors:**

Hannes Alfvén, Ph.D.  
(*Professor Emeritus*)  
Victor C. Anderson, Ph.D.  
Neal H. Bertram, Ph.D.  
Henry G. Booker, Ph.D.  
(*Professor Emeritus*)  
William S.C. Chang, Ph.D.  
William A. Coles, Ph.D.  
Siebert Q. Duntley, D.Sc.  
(*Professor Emeritus*)  
Jules A. Fejer, D.Sc. (*Professor Emeritus*)  
Carl W. Helstrom, Ph.D.  
Walter Ku, Ph.D.  
S.S. Lau, Ph.D.  
Sing H. Lee, Ph.D.  
Robert Lugannani, Ph.D.  
Huey-Lin Luo, Ph.D.  
Elias Masry, Ph.D.  
D. Asoka Mendis, Ph.D.  
Laurence B. Milstein, Ph.D. (*Chairman*)  
Barnaby J. Rickett, Ph.D.  
Manual Rotenberg, Ph.D.  
M. Lea Rudee, Ph.D. (*Dean, Division of  
Engineering*)  
Victor H. Rumsey, D. Eng., D.Sci.  
(*Professor Emeritus*)  
Andrew J. Viterbi, Ph.D.  
Harry H. Wieder, Ph.D.  
Jack K. Wolf, Ph.D.

**Associate Professors:**

George J. Lewak, Ph.D.  
Larry G. Meiners, Ph.D.

**Assistant Professors:**

Shankar Chatterjee, Ph.D.  
Sadik Esener, Ph.D.  
Clark Guest, Ph.D.  
Ramesh R. Rao, Ph.D.  
Paul Yu, Ph.D.

**Adjunct Professor:**

James U. Lemke, Ph.D., *Center for  
Magnetic Recording Research*

**Associated Faculty:**

Gustaf O.S. Arrhenius, Ph.D., *Professor,  
Scripps Institution of Oceanography*  
William B. Hodgkiss, Ph.D., *Assistant  
Professor, Scripps Institution of  
Oceanography*  
John C. Mallinson, *Academic  
Administrator, Center for Magnetic  
Recording Research*

## The Major Programs for Undergraduates

The department offers four-year programs in electrical engineering, engineering physics, and computer engineering. These programs, which lead to the B.S. degree, prepare students for employment in the electrical, electronics, computer, or communications industries, and for graduate work in those fields. In addition, the department offers programs leading to the B.A. degree in applied physics and information science. These are intended for students desiring more time for undergraduate studies outside their major subject. They prepare students for graduate study in their respective fields, as well as for certain types of employment.

To graduate in four years with a B.S. in computer engineering, electrical engineering or engineering physics, a student without advanced standing should enroll for approximately eighteen units for three quarters and sixteen units during other quarters (or attend some summer quarters).

The electrical engineering curriculum features four specializations: communication systems, electronic systems, electronic devices and materials, and systems and control. The computer engineering program treats hardware design, data storage, computer architecture, assembly languages, and the design of computers for engineering, information retrieval, and scientific research. The engineering physics program provides a strong background in physics and mathematics and permits specialization in acoustics, optics, continuum mechanics, or materials science. This program is conducted in cooperation with the Departments of Physics and Applied Mechanics and Engineering Sciences.

Applied physics treats electromagnetism, electronics, optical information processing, and acoustical signal processing. Information science concentrates on communication systems and the processing of information. The B.A. curricula allow individual programs that may involve a com-

## ELECTRICAL AND COMPUTER ENGINEERING

combination of the fields in which the department offers instruction.

CSE 65 or 62B is recommended for all ECE majors. All students intending to do experimental work after graduation, whether in industry or in graduate school, are advised to take ECE 50A-B-C, ECE 132, ECE 146A-B-C, and ECE 138 or CSE 175B. A grade-point average of 2.0 will be required in upper-division courses in the major, including technical electives. Admission to ECE majors will continue to be based on GPA in all required lower-division courses.

A total of at most four units of ECE 197, 198, and 199 may be applied in fulfilling the requirements for a major program in the Department of Electrical and Computer Engineering. These must be taken on a Pass/Not Pass basis.

Students enrolled in the departmental programs who maintain a distinguished scholastic record through their junior year are encouraged to apply for the five-year B.S.-B.A./M.S. program. Applications for admission to the graduate program may be made in the spring quarter of the junior year. In their senior year such students may enroll in graduate courses and can complete the requirements for the master's degree within one year after receiving the bachelor's degree. If the student's eventual aim is to take a Ph.D., he or she will be able to begin research earlier and spend a shorter time in completing the degree. The student's choice of electives must be discussed with his or her adviser.

### ENGINEERING

The department offers B.S. programs in computer engineering, electrical engineering, and engineering physics. Because of Revelle College's extensive general-education requirements, Revelle students will normally be unable to complete the electrical engineering or computer engineering program in four years. Students wishing to transfer to another college should see their college adviser. Students are urged to discuss their curriculum with the appropriate departmental adviser no later than the spring quarter of their freshman year.

Graduates of junior colleges may enter these programs in the junior year. Transfer students should be mindful of the sophomore-year course requirements when planning their programs.

### Computer Engineering

Students wishing to take the computer engineering curriculum must be admitted to either the ECE or CSE department. The

set of required courses and allowed electives is the same in both departments except that ECE 138 must be taken by ECE students and CSE 175B must be taken by CSE students.

The computer engineering program offers a strong emphasis on engineering mathematics and other basic engineering science as well as a firm grounding in computer science. Students should have sufficient background in high school mathematics so that they can take freshman calculus in their first quarter. Courses in high school physics and computer programming, although helpful, are not required for admission to the program.

The required lower-division courses are:

- (i) Math. 2A-2B-2C, 2D or 2DA, 2E or 2EA, 2F.
- (ii) Phys. 2A-2B-2C-2D. Math. 2A is prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and physics in high school may substitute the honors sequence Phys. 3A-3B-3C-3D for Phys. 2A-2B-2C-2D.
- (iii) Phys. 2AL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 3 sequences.
- (iv) CSE 64, 65, and 70.
- (v) ECE 50A-50B-50C and ECE 52AL-52BL-52CL.
- (vi) Chem. 6A-6B or Chem. 7A-7B. A lower-division course in biology may be substituted for Chem. 6B or Chem. 7B.

#### Junior Year

- (a) ECE 105A
- (b) ECE 132
- (c) ECE 138
- (d) ECE 152A-B
- (e) CSE 160A-B
- (f) CSE 161A-B
- (g) CSE 170A-B
- (h) Technical elective (four units)

#### Senior Year

- (a) ECE 146B
- (b) ECE 147A
- (c) CSE 163A
- (d) CSE 171A-B
- (e) CSE 175C
- (f) CSE 180
- (g) Technical electives (eight units)

#### Electives

Any upper-division or graduate course from either the ECE or CSE department may be used as a technical elective.

### Electrical Engineering

The electrical engineering curriculum comprises studies in communication systems, electronic systems, electronic devices and materials, and systems and control; an option in any one of these fields may be selected by the student.

The curriculum in electrical engineering has been accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc.

The required lower-division courses for all options are:

- (i) Math. 2A-2B-2C-2DA-2EA-2F
- (ii) Phys. 2A-2B-2C-2D  
Math. 2A is prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B or a higher course may take Phys. 2A in the fall quarter of the freshman year; all others will take Phys. 2A in the winter quarter of the freshman year. Students who received high grades in both calculus and physics in high school may substitute the honors sequence Phys. 3A-3B-3C-3D for Phys. 2A-2B-2C-2D.
- (iii) Phys. 2AL and Phys. 2CL or 2DL (Limited enrollment).  
These should be taken concurrently with or after the Phys. 2 or Phys. 3 sequences.
- (iv) CSE 65 or 62B, 64, and 70
- (v) ECE 50A-B-C and ECE 52AL-BL-CL.  
These sequences are normally taken in the sophomore year.
- (vi) Chem. 6A or 7A

The upper-division course requirements depend on the option selected by the student. The following are the requirements for the various options.

### Communication Systems Option

#### Junior Year

- ECE 105A-B-C, ECE 152A-B-C  
ECE 140A, ECE 132  
ECE 138  
technical elective (twelve units)

#### Senior Year

- ECE 154A-B-C, ECE 146A-B  
ECE 146C or ECE 136B  
technical elective (twelve units)

**Electronic Systems Option***Junior Year*

ECE 105A-B-C, ECE 152A-B-C  
ECE 132, ECE 135A-B  
ECE 138

technical elective (eight units)

*Senior Year*

ECE 131A-B-C or Physics 100A-B-C,  
ECE 146A-B, ECE 146C or ECE 136B  
technical elective (twelve units)

**Electronic Devices and Materials Option***Junior Year*

ECE 105A-B-C, ECE 152A-B  
ECE 132, ECE 135A-B  
ECE 138

technical elective (twelve units)

*Senior Year*

ECE 131A-B-C  
ECE 136B, ECE 149  
Any two out of ECE 146A, 146B, and  
146C.

technical elective (eight units)

**Systems and Control Option***Junior Year*

ECE 105A-B-C, ECE 152A-B-C  
CSE 170A-B, CSE 175B

technical elective (twelve units)

*Senior Year*

AMES 141A-B-C, ECE 159A-B-C  
technical elective (twelve units)  
(AMES 146A-B-C recommended)

*Electives for all options.*

Any ECE upper-division courses; other  
upper-division courses with the ap-  
proval of the adviser.

**Engineering Physics**

The engineering physics program com-  
prises studies in acoustics, optics, contin-  
uum mechanics, and materials science.  
An option in any one of these fields may  
be selected by the student.

The required lower-division courses for  
all options are:

- (i) Math. 2A-2B-2C-2DA-2EA-2F
- (ii) Phys. 2A-2B-2C-2D or Phys. 3A-3B-  
3C-3D
- (iii) Phys. 2AL, 2CL, 2DL or ECE 52AL-  
BL, Phys. 2DL
- (iv) CSE 65 or 62B, 64 or 70
- (v) ECE 50A-50B-50C
- (vi) Chem. 6A or 7A

**Acoustics Option***Junior Year*

ECE 105A-B-C  
ECE 131A-B-C or Phys. 100A-B-C  
ECE 140A-B-C or ECE 152A-B-C  
Phys. 110A-B, ECE 132

*Senior Year*

ECE 142AL-BL-CL  
Phys. 130A-B, Phys. 152  
ECE 146A-B, AMES 110  
ECE 152A-B-C or AMES 101A-B-C

**Optics Option***Junior Year*

ECE 105A-B-C  
ECE 131A-B-C or Phys. 100A-B-C  
ECE 140A-B-C or ECE 152A-B-C or  
ECE 135A-B, CSE 175B or ECE 138  
Phys. 110A-B, ECE 132

*Senior Year*

ECE 141A-B-C  
Phys. 130A-B, Phys. 152 or ECE 136B  
ECE 146A-B, AMES 110  
ECE 152A-B-C or ECE 154A-B-C or  
ECE 135A-B, CSE 175B or ECE 138

**Continuum Mechanics Option***Junior Year*

AMES 130A-B-C  
ECE 105A-B-C  
ECE 131A-B-C or Phys. 100A-B-C  
Phys. 110A-B or AMES 121A-B(\*)  
ECE 132

*Senior Year*

AMES 101A-B-C  
Phys. 130A-B, Phys. 152  
Phys. 140A-B  
ECE 146A-B or AMES 170, 171A  
AMES 110

**Materials Science Option***Junior Year*

ECE 105A-B-C  
AMES 102, Chem. 126 or 131, ECE 132  
Phys. 110A-B or AMES 121A-B(\*)  
ECE 131A-B-C or Phys. 100A-B-C

*Senior Year*

ECE 133, ECE 137  
Phys. 130A-B  
ECE 135A-B, ECE 136B or  
(ECE 146A-B, ECE 146C or ECE 149)  
Phys. 140A-B, Phys. 152

(\*)Warren College students may take the  
sequence marked (\*) in the sophomore  
year in order to have time in the junior  
year for the upper-division sequence in  
their noncontiguous minor. Alternatively  
they may petition to take this upper-  
division noncontiguous sequence in the  
sophomore year.

**Solid State Electronics Option***Junior Year*

ECE 105A-B-C  
ECE 131A-B-C or Phys. 100A-B-C  
ECE 135A-B, CSE 175B or ECE 138  
ECE 152A-B, ECE 132

*Senior Year*

Phys. 110A, ECE 133, ECE 136B  
ECE 146A-B, ECE 146C or ECE 149  
Phys. 140A-B  
Phys. 130A-B

**THE B.A. CURRICULA****Applied Physics**

The required lower-division courses  
are:

- (i) Math. 2A-2B-2C-2DA-2EA
- (ii) Phys. 2A-2B-2C-2D or Phys. 3A-3B-  
3C-3D
- (iii) Phys. 2AL and Phys. 2CL or 2DL
- (iv) Chem. 6A or 7A
- (v) CSE 65 or 62B, 64
- (vi) ECE 50A-50B-50C and 52AL-  
BL-CL

Math. 2F is recommended.

A total of fifteen upper-division courses,  
approved as a coherent program by the  
adviser, must be passed with a minimum  
2.0 grade-point average in order to satisfy  
the requirements of the major program.  
Of those fifteen the following are required  
of all applied physics majors:

- (a) ECE 105A-B-C
- (b) At least two sequences from the  
following:  
ECE 131A-B-C  
ECE 135A-B, ECE 136A or 136B or  
137 or 149  
ECE 140A-B-C  
ECE 132 and any two out of ECE  
146A, 146B, and 146C.
- (c) At least eight units of undergraduate  
laboratory courses selected from the  
following:  
ECE 133, 136B, 137,  
CSE 175B or ECE 138  
ECE 141A-B-C  
ECE 142AL-BL-CL  
ECE 146AL-BL-CL  
Phys. 120A-B, 121

Electives may be any upper-division  
physical science or mathematics courses  
approved by the adviser. The electives  
should include at least one three-course  
sequence. Components of four typical  
major programs are listed.

**Acoustics**

ECE 105A-B-C, 131A-B-C,  
140A-B-C, 142AL-BL-CL,  
152A-B-C

**Electronics**

ECE 105A-B-C, 131A-B-C, 132,  
135A-B, CSE 175B or ECE 138, 136A-B,  
and any two of ECE 146A-AL, 146B-BL,  
and 146C-CL.

## ELECTRICAL AND COMPUTER ENGINEERING

### Optics

ECE 105A-B-C, 131A-B-C, 140A-B-C, 141A-B-C, 152A-B-C; or Phys. 130A-B and ECE 135A; or ECE 135A-B, 136A

### Solid State

ECE 105A-B-C, 131A-B-C, 132, 137 or 149  
ECE 135A-B  
ECE 136A or 136B, Phys. 130A-B and any two of ECE 146A, 146B, and 146C

### Information Science

This program is less intensive than the programs in electrical engineering listed above. The required lower-division courses are:

- Math. 2A-B-C-DA-EA-F
- Phys. 2A-2B-2C-2D or Phys. 3A-3B-3C-3D
- ECE 50A-B-C
- CSE 65 or 62B

A total of fifteen upper-division courses must be passed with a minimum grade-point average of 2.0 in order to complete the major program. As early as possible, preferably before the beginning of the junior year, the student must discuss the curriculum with the information science faculty adviser. Options in communication systems, electronics, and systems and control are available. See the electrical engineering program for suggested courses in these options.

### Minor Curricula

The following sets of courses represent a variety of minor curricula in the areas of applied physics and information science. The prerequisites for these minor curricula require certain other courses which must therefore be anticipated in the student's program. Revelle students should consult their provost's office concerning their noncontiguous minor.

Not all minor curricula are available to a student pursuing an ECE major curriculum. See the departmental office for a list of permissible minors.

Programs of concentration for Warren College should be selected from this list. Rules concerning overlap with the major curriculum are available from the Office of the Provost, Warren College.

### Acoustics

ECE 140A-B-C, ECE 142AL-BL-CL

### Communication Systems

ECE 152A-B-C, ECE 154A-B-C

### Digital Hardware

ECE 50A, CSE 65, 70, 170A, ECE 138 and 147

### Electromagnetic Waves

ECE 140A-B-C, ECE 131A-B-C

### Electronic Circuits

ECE 50B-C, ECE 132, ECE 146A-B-C

### Electronic Devices

Phys. 2C-2D, ECE 135A, ECE 135B, ECE 136A or 136B, ECE 132

### Applied Optics

ECE 140A-B-C, ECE 141A-B-C

### Queueing Systems

CSE 65 or 62B, CSE 70, CSE 161A, ECE 159A-B-C

### Signal Analysis

ECE 50A-B-C, ECE 152A-B-C

## Admission to Upper-Division Courses

The Department of Electrical and Computer Engineering will attempt to provide sufficient sections of all lower-division ECE courses so that students who meet the prerequisites for a given course will be able to enroll. Students will, however, be screened to ensure that they meet all course prerequisites for these lower-division courses.

Admission to upper-division courses will be restricted to:

- Students admitted by the department to a major or minor curriculum, and
- Students fulfilling a requirement for another major.

Those students not in compliance with the above restrictions should be forewarned that they will automatically be dropped from course rosters (at any time during the quarter) when it comes to the attention of the department that a student is enrolled in a course without being eligible because the prerequisites and/or performance standards have not been met. Admission to all ECE courses will require the departmental stamp on the registration form, and it will be given only by the undergraduate affairs staff.

Students who wish to enroll in an ECE major should apply in accordance with the Division of Engineering admissions policy (above). Transfer students who wish to enter a major curriculum directly must show evidence that they have completed equivalent prerequisite courses.

Because ECE is an overcrowded department, not all students who express an interest can be admitted.

The department will set an overall quota for admission to the major and minor curricula for the following academic year. It will be based upon:

ricula for the following academic year. It will be based upon:

- Preregistration of students who have already completed upper-division ECE courses
- Preregistration of students required to enroll in upper-division courses for major curricula offered by other departments
- Estimates of the number of incoming transfer students who will be admitted to the major curricula, and
- Class limits for upper-division courses.

### Transfer Students

Requirements for admission to upper-division courses and to the major curricula are the same for transfer students as for continuing students. When planning their program, students should be mindful of lower-division prerequisites necessary for admission to upper-division courses. Transfer students should be prepared to present the department a copy of their records for evaluation of eligibility prior to enrolling in ECE courses.

Students who wish to enter a major curriculum directly must make application to the department before the beginning of the fall quarter, submitting course descriptions and transcripts for courses used to satisfy their lower-division requirements. Although admission is not normally restricted to the fall quarter, transfer students entering in the winter or spring quarter should be aware that scheduling difficulties may occur because upper-division sequences normally begin in the fall quarter.

## The Graduate Programs

There are three main divisions of study:

### 1. Electrical Engineering (Applied Physics)

This division includes the following areas of study:

- Radio Astronomy and Space Physics.* The theoretical and experimental investigation of physical processes relating to the structure of the sun and planetary bodies. Current studies are related to planetary atmospheres, ionospheres, magnetospheres, the nature of the solar wind and solar corona, comets, asteroids, interplanetary dust, and condensation of matter in space.

The department has available the facilities of several radio astronomical observatories. In addition a large local

radio observatory has been established to observe the structure of the solar wind by means of radiostar scintillations.

- (b) *Materials Science and Solid State Electronics.* The field of material science includes the synthesis, characterization and application of metals, semiconductors and dielectric materials, principally in the form of thin layers. The field of solid state electronics includes the construction, evaluation, and modeling of prototype electronic devices and integrated circuits based on silicon and III-V compound semiconductors and of processing methods and techniques employed in present-day or projected large-scale integrated circuit applications. Current research interests include the metallurgical aspects of interfaces, the study of superconductors and tunneling phenomena, magnetic materials, the electronic, optical and electro-optic properties of heterojunction structures. The department has available a complete facility for fabricating prototype silicon and III-V compound transistors and other devices, a Rutherford backscattering facility, molecular beam epitaxial deposition system, liquid phase epitaxial apparatus, cryogenic temperature facilities and auxiliary apparatus for x-ray, optical, electro-optic, electrical and galvanomagnetic characterization of materials, devices and components.

- (c) *Applied Optics.* This field involves the application of systems combining optics and electronics to image processing, parallel computing, and fiber optics communication. Current system studies include hybrid optical/electronic processing, optical processing with feedback and nonlinearity, optical associative memory, optical neural nets, robotic vision (optical pattern recognition), and digital optical computing systems. Algorithmic and architectural studies on these parallel optical processing systems are complemented by studies on optoelectronic devices involving optical spatial light modulators as logic and memory devices, nonlinear optical crystals for image amplification, logic and 3-D memory, and computer generated holography for optical interconnects used in optical processors and VLSI circuits. Integrated optical circuits, fiber optics, diffraction and focussing of guided wave modes, guided wave modulators, integrated optical and

electronic devices on III-V semiconductors, semiconductor injection lasers and detectors are studied for optical communication. The applied optics program has available extensive facilities for optical system and device research. A number of lasers (e.g., argon, krypton, dye, carbon dioxide, helium neon, color center, Nd/YAG and gallium arsenide lasers), detectors, infra-red vidicons, spectrometers, interferometers, a considerable amount of high-quality optics and several vibration-isolation tables are available. In addition to research into new types of Spatial Light Modulators, several liquid crystal light valves, micro-channel/spatial light modulators, and a Pockels readout optical modulator are available. Facilities available for microfabrication of optoelectronic circuits and devices including an r.f. and magnetron sputtering system, plasma etching, reactive ion beam etching, plasma enhanced chemical vapor deposition, low-pressure chemical vapor deposition pyrogenic oxidation, a liquid-phase epitaxy system, molecular beam epitaxy system, a photolithography facility, and diffusion furnaces.

- (d) *Magnetic Recording.* Magnetic recording is an interdisciplinary field involving physics, material science, communications, and mechanical engineering. The physics of magnetic recording involves studying magnetic heads, recording media, and the process of transferring information between the heads and the medium. General areas of investigation include: nonlinear behavior of magnetic heads, very high-frequency loss mechanisms in head materials, characterization of recording media by micromagnetic and many body interaction analysis, response of the medium to the application of spatially varying vectorial head fields, fundamental analysis of medium nonuniformities leading to media noise, and experimental studies of the channel transfer function emphasizing non-linearities, interferences, and noise.

Current projects involve utilization of the Cray X-MP 48 at UCSD to perform numerical simulations of high-density digital recording in metallic thin films, micromagnetic analysis of magnetic reversal in individual magnetic particles again utilizing the Cray, theory of recorded transition phase noise and magnetization induced

nonlinear bit shift in thin metallic films, and analysis of the thermal-temporal stability of interacting fine particles.

Facilities for theoretical and experimental research are in the 44,000 square foot Center for Magnetic Recording Research building. Experimental equipment include a large-scale sputterer for disc media preparation, state of the art computer controlled vibrating magnetometer, and precision tape and disc drives for recording studies. The center maintains its own computational facility for use by supported students and faculty.

## 2. Electrical Engineering (Communication Theory and Systems)

Communication Theory and Systems in ECE involves the detection of signals and the transmission and processing of information in the acoustic, radio, and optical domains, the prediction and filtering of random processes, design and analysis of communication systems, and the propagation of acoustic and electromagnetic waves. Additional research is being performed in the areas of protocols for communication networks and the use of error correction techniques for spread spectrum and other digital communication systems, and for recording data in magnetic storage media. Applications are made to such fields as communications, radar, sonar, oceanography, holography, image processing, and visibility in air and water. Information processing is carried out by electronic, acoustic, and optical filtering, photographically and by digital computers. Both theoretical and practical aspects of information processing are studied. Both the master of science and the doctor of philosophy degrees are offered.

## 3. Interdepartmental Curriculum in Applied Ocean Science

The Graduate Department of the Scripps Institution of Oceanography, the Department of Electrical and Computer Engineering, and the Department of Applied Mechanics and Engineering Sciences offer an interdepartmental program in applied science related to the oceans. All aspects of man's purposeful and useful intervention into the sea are included. Students who enroll will receive the degree of Ph.D. upon completion of normal departmental requirements and certain others stipulated by an interdepartmental faculty committee.



## ELECTRICAL AND COMPUTER ENGINEERING

### Preparation

Applications will be considered from students who have taken undergraduate majors in one of the following disciplines: applied mathematics, applied physics, computer science, electrical engineering, engineering physics, engineering science, mathematics, and physics. Applications will also be considered from students who wish to take interdisciplinary programs.

### MASTER'S DEGREE PROGRAMS

The general requirements for the degree of master of science are stated in the "Graduate Studies" section of the catalog. The department offers master's degree programs in electrical engineering (applied physics), and electrical engineering (communication theory and systems). In electrical engineering both Plan I and Plan II are offered with the same course requirements. Either plan calls for forty-eight units, which is more than the thirty-six units minimum university requirement. However, Plan I requires six units of research with an adviser under ECE 298 or 299. Normally no financial support is offered to students enrolled in the M.S. program.

#### 1. Electrical Engineering

##### A. Applied Physics

The M.S. program in electrical engineering (applied physics) includes the fields of radio astronomy and space physics, materials science, applied optics, and electronic devices and materials. The program allows the students to deepen their understanding in the field of their choice.

##### Course Requirements

The following core courses are required: Math. 210A-B-C or AMES 294A-B-C and any two sequences (twenty-four units) selected normally from the following:

ECE 232A-B-C

ECE 220A-B-C

ECE 241A-B-C

ECE 242A-B-C

ECE 251A-B-C

Phys. 203A-B

Phys. 211, Phys. 212B-C

In addition, elective courses to complete a total of forty-eight units must be taken. The specific core and elective courses to be selected must be approved by the graduate adviser. The intention of the core courses is to ensure adequate breadth.

##### B. Communication Theory and Systems

The M.S. program in communication theory and systems stresses the mathematical principles and the analysis and design of modern communication systems. To complete the program, a student must satisfy the course requirements and either pass a comprehensive examination (for Master's Plan II) or write a master's thesis (for Master's Plan I). The comprehensive examination, which is offered in both the fall and spring quarters, consists of a written part and an oral part. Students with a good undergraduate background can complete the program in one year of full-time study.

##### Course Requirements

ECE 250A-B

ECE 254A-B-C or

ECE 258A-B-C

Math. 210A-B, Math. 210D

Four quarters of approved electives

In addition, elective courses to complete a total of forty-eight units must be taken. Any ECE, AMES, or mathematics graduate course or upper-division course is acceptable, subject to the consent of the graduate adviser.

### THE DOCTORAL PROGRAMS

The department has established a set of requirements applying to the first two years of the Ph.D. program as described below. Ph.D. students are expected to maintain, on an annual basis, a 3.4 grade-point average for the core courses. They must pass a comprehensive examination.

In the second year graduate students are expected to devote at least half their time to research and must present the results of their research before a committee of three faculty members in a research examination.

Ph.D. students entering with a master's degree may petition for waiver of the core courses or for substitution of alternative courses. Students who have satisfied these departmental graduate requirements may register for any ECE course on a satisfactory/unsatisfactory basis.

#### A. Applied Ocean Sciences

##### 1. Core Courses:

Math. 210A-B-C or AMES 294A-B-C, SIO 210A, 240, 260, 280, and one additional three-course sequence listed under "Core Courses" for electrical engineering (applied physics) or electrical engineering (communication the-

ory and systems). Continuing enrollment in the Applied Ocean Science Seminar (SIO 208) is required.

2. Comprehensive Examination: Students are required to pass the written applied ocean science examination covering the applied ocean sciences core courses. The examination is given during the second year. Upon successful completion of the written examination the student will be given an oral examination by an interdepartmental committee composed of two ECE faculty members and one faculty member from SIO or AMES.

#### B. Electrical Engineering (Applied Physics)

##### 1. Core Courses:

Math. 210A-B-C or AMES 294A-B-C, and two sequences (twenty-four units) selected normally from the following:

ECE 232A-B-C

ECE 220A-B-C

ECE 241A-B-C

ECE 242A-B-C

ECE 251A-B-C

Phys. 203A-B

Phys. 211, 212A-B

The specific courses to be selected must be approved by the graduate adviser. The intention of the core courses is to ensure adequate breadth.

##### 2. Comprehensive Examination:

Students majoring in electrical engineering (applied physics) are required to take a written comprehensive examination in the first year of graduate study at UCSD. It is offered twice a year, in the fall and spring quarters. The examination may be repeated once.

#### C. Electrical Engineering (Communication Theory and Systems)

##### 1. Core Courses:

ECE 250A-B

ECE 254A-B-C

ECE 258A-B-C

Math. 210A-B, Math. 210D

##### 2. Comprehensive Examination:

A comprehensive examination on upper-division material in communication theory, signal analysis, and random processes must be passed during the first year of graduate study. It is given in the fall and spring quarters.

#### Dissertation

In order to be admitted to the university qualifying examination, a student must

have satisfied the departmental graduate requirements and have been accepted by a faculty member as a Ph.D. thesis candidate. A candidate for the Ph.D. will write a dissertation and defend it in a final oral examination conducted by the doctoral committee.

### Financial Aids

Financial support is available to qualified graduate students in the form of fellowships, loans, and assistantships. Stipends for half-time research assistantships are \$902 per month, with the possibility of full-time employment during the summer months. For a half-time teaching assistantship the stipend is \$1,163 per month. Requests for application forms for admission and financial support should be directed to the Department of Electrical and Computer Engineering.

### Courses

The department will endeavor to offer the courses as outlined below; however, unforeseen circumstances sometimes mandate a change of scheduled offerings. Students are strongly advised to check the *Schedule of Classes* or the department before relying on the schedule below.

The names appearing below the course descriptions are those of faculty members in charge of the courses. For the names of the instructors who will teach the courses, please refer to the quarterly *Schedule of Classes*. CSE 65 and CSE 62B are interchangeable as prerequisites for other courses.

### Lower Division

#### 50A. Linear System and Circuit Analysis (4) (Formerly EECS 50A.)

Physical behavior of circuit elements — resistance, capacitance, inductance and mutual inductance; reference directions for voltage-current relationships; Kirchhoff's voltage and current laws; source transformations; loop and node analysis; initial conditions; classical solution of systems of differential circuit equations. Three hours' lecture, one hour's recitation. *Prerequisites: Math. 2B and Phys. 2B or 3B (may be taken concurrently).* (F) Mr. Lugannani

#### 50B. Linear System and Circuit Analysis (4) (Formerly EECS 50B.)

The Laplace transform; inverse transform; partial fraction expansions; solution of network equations using Laplace transforms; convolution integral; the concept of complex frequency; impedance of circuit elements; series and parallel combinations of impedances; Thevenin's and Norton's theorems; driving point and transfer functions; poles and zeroes of driving point impedances and transfer functions. Three hours' lecture, one hour's recitation. *Prerequisites: ECE 50A and Math. 2DA (may be taken concurrently).* (W) Mr. Lugannani

#### 50C. Linear System and Circuit Analysis (4) (Formerly EECS 50C.)

Two-port networks; sinusoidal steady-state analysis; frequency response plots; Bode plots; stability and the Nyquist criterion; optimum power transfer; periodic functions and Fourier series; evaluation of Fourier coefficients; steady-state network response to periodic inputs; the Fourier transform

and inverse Fourier transform; application to network analysis. Three hours' lecture, one hour's recitation. *Prerequisite: ECE 50B.* (S) Mr. Lugannani

#### 52AL. Elementary Measurements Laboratory I (2) (Formerly EECS 52AL.)

The use of the oscilloscope, function generator, digital multimeter. Components and their ratings. Frequency characteristics of measuring instruments. Measurements of capacity and inductance. The concepts of time and frequency domains. The RC filter. Emphasis is placed on report writing. *Prerequisite: Phys. 2B or equivalent.* (F) Mr. Rotenberg

#### 52BL. Elementary Measurements Laboratory II (2) (Formerly EECS 52BL.)

The LC filter. The idea of universal frequency characteristics. The Q factor. Band-pass RC filters, RLC filters and notch filters. Filter design. *Prerequisite: ECE 52AL.* (W) Mr. Rotenberg

#### 52CL. Elementary Measurements Laboratory III (2) (Formerly EECS 52CL.)

Operational amplifiers. Diode and zener-diode characteristics. Wave shaping non-linear circuits. Rectification. Power supply specifications and characteristics. Power supply design. Regulation. *Prerequisite: ECE 52AL and 52BL.* (S) Mr. Rotenberg

### Upper Division

#### 105A. Introduction to Mathematical Physics I (4) (Formerly EECS 105A.)

Functions of a complex variable with applications to Laplace transforms, conformal mapping, two-dimensional electrostatic and flow problems. Review of ordinary differential equations, series solutions. *Prerequisites: Math. 2DA, 2EA, 2F and ECE 50C, Phys. 2A-B-C or equivalent.* (F) Mr. Lewak

#### 105B. Introduction to Mathematical Physics II (4) (Formerly EECS 105B.)

Special functions, eigenfunction problems. Fourier series, review of vectors, grad, div, curl, multidimensional integrals, Green's and Stokes's theorems, curvilinear coordinates, maxima, minima, calculus of variations, partial differential equations. *Prerequisite: ECE 105A.* (W) Mr. Lewak

#### 105C. Introduction to Mathematical Physics III (4) (Formerly EECS 105C.)

Applications of material from ECE 105A and B, such as solutions of the wave, heat flow, and Poisson equations, Green's function methods. *Prerequisite: ECE 105B.* (S) Mr. Lewak

#### 131A. Electromagnetism (4) (Formerly EECS 131A.)

(E,D) fields, Gauss's law, electrostatic potential. Divergence, curl, (B,H) fields, Ampere's law. Similarities and differences between electric and magnetic fields. Biot-Savart law. Displacement current. Electromotance, Faraday's law, Maxwell's equations. Scalar, vector, and Hertzian potentials. Current elements as dipoles. Radiation. Three hours' lecture, one hour's recitation. *Prerequisites: Phys. 2B or 3B and Math. 2C or consent of instructor.* (F) Mr. Booker

#### 131B. Electromagnetism (4) (Formerly EECS 131B.)

Electromagnetic equations in materials. Boundary conditions. Conductivity, electric and magnetic susceptibility. Real and complex dielectric constants and refractive indices. Reflection and reflection of plane waves at a plane interface. Evanescent waves. Models of dielectric, magnetic and conducting materials, including plasma. Three hours' lecture, one hour's recitation. *Prerequisite: ECE 131A.* (W) Mr. Booker

#### 131C. Electromagnetism (4) (Formerly EECS 131C.)

Electromagnetic energy, energy density. Poynting's vector and theorem. Storage and flow of energy in oscillatory circuits and oscillatory electromagnetic fields. Resistive, reactive and complex power complex Poynting vector. Circuit and field impedance. The Lorentz transformation. Electromagnetic fields in moving materials. Three hours' lecture, one hour's recitation. *Prerequisite: ECE 131B.* (S) Mr. Booker

#### 132. Analog Electronic Circuits (4) (Formerly EECS 132.)

Feedback systems, applications to operational amplifiers, sensitivity, gain bandwidth, limits, stability, compensation; design of simple active filters. Circuit models for bipolar junction and field effect transistors. Analysis and design of small- and large-signal transistor stages appropriate for integrated circuits. Three hours' lecture, three hours' laboratory. *Prerequisites: ECE 50A-B-C, and 52AL-BL-CL. ECE 105A and 152A recommended.* (F,W,S) Mr. Rickett or Mr. Meiners

#### 133. Structure of Solids (4) (Formerly EECS 133.)

Atomic structure, properties and growth of ordered and disordered solids. Laboratory work includes generation of X-ray spectra, symmetry determination by Laue-technique, structure determination by single crystal and powder techniques, electron diffraction and radial distribution analysis. Four hours' lecture. *Prerequisite: consent of instructor.* (See also "Material Science Program" section.) (Offering depends on enrollment; check with department.) Staff

#### 135A. Semiconductor Physics (4) (Formerly EECS 135A.)

Review of quantum theory, crystalline lattices, band theory of solids, electron statistics, carrier motion in semiconductors, junction theory, semiconductor devices related to p-n junction diodes. Three hours' lecture. *Prerequisites: Phys. 2D or 3D and ECE 105A concurrently.* (F) Mr. Luo

#### 135B. Transistor Physics (4) (Formerly EECS 135B.)

Physics of semiconductor devices, mainly bipolar junction transistors (BJT), field-effect transistors (FET) and metal-oxide-semiconductor transistors (MOS). Discussion of general characteristic equations, device parameters, and various models. Three hours' lecture. *Prerequisite: ECE 135A.* (W) Mr. Chang

#### 136A. Fundamentals of Semiconductor Device Fabrication (4) (Formerly EECS 136A.)

Crystal growth, controlled diffusion, determination of junction-depth and impurity profile, epitaxy, oxidation, and photolithography techniques, monolithic process. Three hours' lecture. *Prerequisites: ECE 135A-B or equivalent.* (F) Mr. Chang or Mr. Yu

#### 136B. Microelectronics Laboratory (4) (Formerly EECS 136B.)

This course is designed to provide laboratory training for students who are interested in the fabrication of semiconductor devices. Lectures will be combined with laboratory to cover photolithography, oxidation, diffusion, thin film deposition, etching and evaluation of devices such as diodes, bipolar transistors and field effect transistors. *Prerequisites: ECE 135A-B, 136A recommended.* (F,W,S) Mr. Chang or Mr. Lau

#### 137. Materials Laboratory (4) (Formerly EECS 137.)

A laboratory course covering experimental concepts and approaches in the study of materials, including preparation, processing, alloying, crystal growing, physical metallurgy, and various techniques in the evaluation and characterization of materials. Four to six hours' laboratory. *Prerequisite: some background in solid-state physics or consent of instructor.* (S) Mr. Luo

#### 138. Digital Circuits Design (4) (Formerly EECS 138.)

Introduction to designing digital electronic systems. Topics covered include logic gates, combinational and sequential logic circuits, memory, programmable array logic, and data processing system organization. Three hours' lecture. *Prerequisites: ECE 50A-B-C and 52AL-BL-CL. ECE 132 recommended.* (Students who have taken CSE 175B may not take ECE 138 for credit.) (S) Mr. Guest

#### 140A. Diffraction Informatics (4) (Formerly EECS 140A.)

Acoustic and electromagnetic waves in one dimension. Reflection and transmission at a boundary. Multiple boundaries and design of impedance transformers. Reciprocity. Waves in three dimensions. Resonances of rectangular cavities. Transmission along rectangular waveguides. Dispersion of electromagnetic, acoustic, and other waves. Three hours' lecture, two hours' recitation. *Prerequisites: Math. 2D or 2DA and ECE 50C. Concurrent registration in ECE 105A recommended.* (F) Mr. Chang

#### 140B. Diffraction Informatics (4) (Formerly EECS 140B.)

Fraunhofer patterns of arrays of point sources. Diffraction patterns as Fourier transforms and Huygens' Principle. Design of interferometers, telescopes, microscopes, antennas, and acoustic radiators. Lenses as Fourier transformers. Fresnel diffraction and occultation. Three hours' lecture, two hours' recitation. *Prerequisite: ECE 140A or consent of instructor. Concurrent registration in ECE 105B recommended.* (W) Mr. Chang

## ELECTRICAL AND COMPUTER ENGINEERING

### 140C. Diffraction Informatics (4)

(Formerly EECS 140C.)

Fourier transforms and the angular spectrum of plane waves. Fresnel transforms and spherical waves. Elements of information processing using coherent and incoherent diffraction patterns. Images: Information stores in X-ray, optical, radio and acoustic diffraction patterns. Holography. Three hours' lecture, two hours' recitation. *Prerequisite: ECE 140B or consent of instructor. Concurrent registration in ECE 105C recommended.* (S) Mr. Chang

### 140E. Optical Engineering (4)

(Formerly EECS 140E.)

Introduction to modern optics and optical systems as applied to modern engineering problems. Optical sources, imaging systems, optoelectronic devices, and optical system applications are covered. Computer aided design of optical systems is included. Three hours' lecture, two hours' recitation. *Prerequisites: Math. 2D, Phys. 2C and 2D.* (W) Mr. Guest

### 141A. Lasers and Holography (4)

(Formerly EECS 141A.)

Lensless holograms, multiple beam holograms, bleached holograms, computer-generated binary holograms, color holograms. Laser principles. Solid-state laser, liquid (or dye) lasers, gas lasers. Laser resonator designs. Laser parameter measurements. Two hours' lecture, six hours' laboratory. *Prerequisite: ECE 140C or ECE 140E.* (F) Mr. Yu or Mr. Guest

### 141B. Optical Signal Processing (4)

(Formerly EECS 141B.)

Optical transformation with various lens systems. Design of a Fourier spectrum analyzer. Imaging and information processing with coherent and incoherent illuminations. Partial coherence, impulse response, and transfer function concepts. Optical spatial filtering and spatial filter synthesis. Production of optical components such as a lens or a spherical mirror. Two hours' lecture, six hours' laboratory. *Prerequisite: ECE 140C or ECE 140E.* (W) Mr. Lee or Mr. Guest

### 141C. Optical Electronics and Communications (4)

(Formerly EECS 141C.)

Principles and performance characteristics of important devices and components in optical electronics and communication systems, which include light sources (laser diodes and light emitting diodes), modulators (electro-optic and acousto-optic, waveguides or transmission media for light (fibers and integrated optical guides), and optical detectors. Engineering design considerations for optical electronic circuits and optical communication systems. Two hours' lecture, six hours' laboratory. *Prerequisite: ECE 140C or ECE 140E.* (S) Mr. Guest or Mr. Yu

### 142AL-BL-CL. Acoustics Laboratory (4-4-4)

(Formerly EECS 142AL-BL-CL.)

Automated laboratory based on H-P GPIB controlled instruments. Software control data collection and analysis. Vibrations and waves in strings and bars of electromechanical systems and transducers. Transmissions, reflection, and scatterings of sound waves in air and water. Aural and visual detection. Four hours' laboratory, two hours' lecture. *Prerequisite: concurrent registration in ECE 140A-B-C or consent of instructor.* (F,W,S) Mr. Anderson

### 143. Fundamentals of Magnetic Recording (4)

(Formerly EECS 143.)

Basic theoretical concepts in magnetic recording, including magnetic measurement techniques, magnetic materials for heads, structure and function of heads, reproduction process, noise, audio and instrumentation readers, video recorders, and digital recording. Three hours' lecture. *Prerequisites: ECE 50C and ECE 131A.* (S) Mr. Mallinson

### 144. Magnetic Recording Laboratory (4)

(Formerly EECS 144.)

Measurements and analysis of frequency dependence of recording head permeability, inductance and efficiency. Field plotting and Fourier transforms of head fields. Recording spectra and pulse measurements and media characterization using current recording systems. One hour's lecture, seven hours' laboratory. *Prerequisite: ECE 143 and undergraduate laboratory course such as ECE 146A-B or Physics 120A.* (S) Mr. Bertram

### 146A. Analog Systems and Circuits (4)

(Formerly EECS 146A.)

Design of analog integrated circuits: operational amplifiers, voltage regulators, and phase-locked loops. Use of feedback at circuit and system levels. Effect of circuit design on noise performance. Circuit designs will be tested in the laboratory

and simulated by computer. Three hours' lecture, three hours' laboratory. *Prerequisites: ECE 105A, 152A, 132. ECE 135A-B and 152B-C recommended.* (F) Mr. Coles

### 146B. Digital Electronic Circuits and Systems (4)

(Formerly EECS 146B.)

Application of MOS field effect transistors and bipolar transistor to digital circuits. Design of digital system building blocks including standard logic families, flip-flops, programmable logic arrays, shift registers, static and dynamic random access memories, digital-analog and analog-digital converters and computer and microprocessor circuits. *Prerequisite: ECE 132. CSE 175B recommended.* (W) Mr. Coles

### 146C. Microwave Systems and Circuits (4)

(Formerly EECS 146C.)

Waves, distributed circuits, and scattering matrix methods. Detection and frequency conversion using microwave diodes. Design of transistor amplifiers including noise performance. Analysis of simple antenna systems. Circuit designs will be tested in the laboratory and simulated by computer. Three hours' lecture, three hours' laboratory. *Prerequisites: ECE 105A-B-C, ECE 132 and ECE 140A. ECE 131A-B-C, 146A and 135A-B recommended.* (S) Mr. Rickett

### 146AL-BL-CL. Electronics Laboratory (2-2-2)

(Formerly EECS 146AL-BL-CL.)

Additional laboratory projects on material covered in ECE 146A-B-C. Four hours' laboratory. *Prerequisites: concurrent registration in ECE 146A-B-C required.* (F,W,S) Mr. Rickett, Mr. Lewak

### 147A. Data Acquisition and Process Control (4)

(Formerly EECS 147A.)

Concepts and techniques necessary for using mini- and microcomputer systems to gather data and control equipment are taught. Peripheral equipment bus standards are included. Information concerning equipment commonly interfaced to computers such as video systems and servo mechanisms is provided. Three hours' lecture. *Prerequisites: ECE 138 and CSE 170A. ECE 132 is recommended.* (F) Mr. Guest

### 149. Semiconductor Device Modeling and Design (4)

(Formerly EECS 149.)

An investigation of semiconductor device modeling based on first-principles physical models. Limitation of IC design based on physical constraints and processing technology. Study of integration possibilities using state of the art processing technology. Three hours' lecture. *Prerequisites: ECE 132 and ECE 135A-B.* (S) Mr. Meiners

### 150. Electronic Signal Processing (4)

(Formerly EECS 150.)

Design of linear filters for time series and sequences. Analog active filters for both continuous and discrete time. Digital filter algorithms and implementation in hardware. Adaptive filters. Filter designs will be tested in the laboratory and simulated by computer. Three hours' lecture, three hours' laboratory. *Prerequisites: ECE 132, 152A, and CSE 175B. ECE 146B and 152B-C recommended.* (W,S) Mr. Coles

### 152A. Signal Analysis (4)

(Formerly EECS 152A.)

Fourier series and transform, sampling representation of linear systems and filters, feedback control, digital filters, and z-transforms. *Prerequisites: ECE 50C, Math. 2DA-2EA-2F, and ECE 105A concurrently.* (F) Mr. Helstrom

### 152B-C. Signal Analysis (4-4)

(Formerly EECS 152B-C.)

Random variables, probability distributions, expected values, transformation of random variables. Stochastic processes, correlation functions, spectral densities, the Gaussian process, random noise in linear systems. *Prerequisite: ECE 152A or ECE 105A or consent of instructor.* (W,S) Mr. Helstrom

### 154A. Communications Systems (4)

(Formerly EECS 154A.)

Review of stochastic processes including correlation functions and power spectral densities. Orthogonality principle and optimum linear mean-square estimation, including solution of Wiener-Hopf equation. Description of analog modulation systems including AM SSB, DSB, VSB, FM, and PM. *Prerequisites: ECE 152A-B-C.* (F) Mr. Milstein

### 154B. Communications Systems (4)

(Formerly EECS 154B.)

Analysis of analog modulation systems in the presence of noise including both coherent and noncoherent demodula-

tion and including threshold effects in FM. Analysis of performance of digital modulation techniques including probability of error results for PSK, DPSK, and FSK. Introduction to effects of intersymbol interference and fading. *Prerequisite: ECE 154A.* (W) Mr. Milstein

### 154C. Communications Systems (4)

(Formerly EECS 154C.)

Detection and estimation theory including optimal receiver design and maximum-likelihood parameter estimation. Introduction to information theory and coding, including entropy, average mutual information, channel capacity, and block codes. *Prerequisite: ECE 154B.* (S) Mr. Milstein

### 159A. Queuing Systems (4)

(Formerly EECS 159A.)

Analysis of single- and multi-server queuing systems; queue size and waiting times. Modeling of telephone systems, interactive computer systems and the machine repair problems. Three hours' lecture. *Prerequisite: ECE 152B or Math. 180A.* (F) Mr. Masry

### 159B. Queuing Systems (4)

(Formerly EECS 159B.)

Queues in tandem. Priority scheduling, computer systems application; time-sharing scheduling, modeling and performance of interactive multi-programmed computer systems. Three hours' lecture. *Prerequisite: ECE 159A.* (W) Mr. Masry

### 159C. Queuing Systems (4)

(Formerly EECS 159C.)

Computer systems modeling; a case study. Elements of computer-communication networks; delay analysis, capacity and flow assignments, random access techniques. Operation research applications, cost models and optimization, a case study, introduction to inventory systems. Three hours' lecture. *Prerequisite: ECE 159B.* (S) Mr. Masry

### 195. Teaching (2 or 4)

(Formerly EECS 195.)

Teaching and tutorial activities associated with courses and seminars. Not more than four units of ECE 195 may be used for satisfying graduation requirements. (P/NP grades only.) Three hours' lecture. *Prerequisite: consent of the department chairman.*

### 197. Field Study in Electrical and Computer Engineering (4, 8, 12, or 16)

(Formerly EECS 197.)

Directed study and research at laboratories and observatories away from the campus. (P/NP grades only.) *Prerequisites: consent of instructor and approval of the department.*

### 198. Directed Group Study (2 or 4)

(Formerly EECS 198.)

Topics in electrical and computer engineering whose study involves reading and discussion by a small group of students under direction of a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.*

### 199. Independent Study for Undergraduates (2 or 4)

(Formerly EECS 199.)

Independent reading or research by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.*

## Graduate

### 210A. Physics of Magnetic Recording (4)

(Formerly EECS 210A.)

This course covers physical behavior of magnetic materials utilized as recording media and heads. Basic magnetic phenomena such as fields, ferromagnetism, demagnetization and domains will be examined, as well as phenomena particular to recording applications, e.g., coercivity and relation mechanisms. *Prerequisites: ECE 131A-B-C, 152A-B-C, or consent of instructor.* (F) Mr. Bertram

### 210B. Analysis of the Magnetic Recording Process (4)

(Formerly EECS 210B.)

In depth discussion of the magnetic recording process. Fields from recording heads will be reviewed and the linear reproduce process will be analyzed. The nonlinear record process and media noise mechanism will be discussed and signal-to-noise ratios calculated. *Prerequisites: ECE 131A-B-C, 152A-B-C, or consent of instructor.* (W) Mr. Bertram

**210C. Magnetic Recording Laboratory (4)**

(Formerly EECS 210C.)

Purpose is for students to gain experience in most of the basic measurements in magnetic recording. Fundamental properties of heads and media will be measured and analyzed. Recording process will be examined by pulse and spectral measurements on recording systems. *Prerequisites:* ECE 132 or 146A, or consent of instructor. (S) Mr. Bertram

**220A. Solid State Electronics (4)**

(Formerly EECS 220A.)

This course is designed to provide a general background in solid state electronic materials and devices. Course content emphasizes the fundamental and current issues of semiconductor physics related to the ECE solid state electronics sequences. *Prerequisites:* fundamentals of quantum mechanics, ECE 135A-B or equivalent. (F) Mr. Lau

**220B. Solid State Electronics (4)**

(Formerly EECS 220B.)

The physical models for the bipolar junction transistor, the junction field-effect transistor, the metal-oxide-semiconductor (MOS) diode, and the MOS field-effect transistor are developed. Models for the behavior of these devices in circuits are also developed. *Prerequisite:* ECE 220A. (W) Mr. Meiners

**220C. Solid State Electronics (4)**

(Formerly EECS 220C.)

Fundamental concepts and experimental methods in magnetism, intrinsic magnetic properties and magnetization processes such as exchange mechanisms, magnetic anisotropy, domain wall structures, etc. Magnetic materials and their applications. *Prerequisite:* consent of instructor. (S) Mr. Luo

**220D. Characterization of Electronic Devices (4)**

(Formerly EECS 240D.)

Characterization of the electrical and galvanomagnetic properties of semiconductors relevant to the technology of transistors and integrated circuits. *Prerequisite:* consent of instructor. (S) Mr. Wieder

**221. Thin Film Phenomena (4)**

(Formerly EECS 221.)

This course is designed to provide a general survey of thin film processes pertinent to microelectronics. Topics to be discussed include: preparation methods, various modern analytical techniques, physical properties, growth morphology, interface reaction and alloy formation and applications. (W) Mr. Lau and Mr. Luo

**222. The Field Effect and Field Effect Transistors (4)**

(Formerly EECS 222.)

Physics of the field effect of elemental and III-V compound semiconductors related to the technology and characteristics of Schottky barrier gate, insulated gate and junction gate field effect transistors. *Prerequisite:* consent of instructor. (S) Mr. Wieder

**224. Introduction to VLSI Microfabrication Technology (4)**

(Formerly EECS 247.)

(Very Large-Scale Integration). Analysis and experimental results of VLSI microfabrication processes such as lithography, dry etching processes, shallow junction formation by implantation and annealing, and yield modeling will be presented in the lectures, plus discussions of the lecture materials and current literature in recitation sessions. Written report and verbal presentation of term projects on specialized topics will be made by each student. *Prerequisite:* ECE 135B, ECE 136A or 136B or microfabrication experience. (S) Mr. Chang

**232A-B-C. Applied Electromagnetic Theory (4-4-4)**

(Formerly EECS 232A-B-C.)

Electrostatics and dielectric materials. Uniqueness, reciprocity, and Poynting theorems. Solutions to Maxwell's equations in rectangular, cylindrical, and spherical coordinates. Waves in isotropic and anisotropic media, transmission lines, waveguides, optical fibers, and resonant structures. Radiation, propagation and scattering problems. Scattering matrices, microwave circuits and antennas. Mr. Rickett

**233. Structure of Solids (4)**

(Formerly EECS 233.)

Atomic structure, properties and growth of ordered and disordered solids. Laboratory work includes generation of X-ray spectra, symmetry determination by Laue-technique, structure determination by single crystal and powder techniques,

electron diffraction and radial distribution analysis. (W) Mr. Arrhenius

**236. Research in Cosmic Plasma Physics (4)**

(Formerly EECS 236.)

Survey of new approach to astrophysics based on results of space research. Relations between laboratory physics and astrophysics. Electric and magnetic fields; magnetosphere; jet streams of solid bodies in space; asteroids, comets, meteors. Evolution of solar systems. Galactic plasmas. Cosmology. (W) Mr. Alfven

**241A. Lasers and Optics (4)**

(Formerly EECS 241A.)

Fresnel and Fraunhofer Diffraction Theory. Optical resonators, interferometry. Gaussian beam propagation and transformation. Laser oscillation and amplification, Q-switching and mode locking of lasers, some specific laser systems. *Prerequisites:* ECE 140A or ECE 131C or equivalent; introductory quantum mechanics. (F) Mr. Chang or Mr. Lee

**241B. Optical Information Processing (4)**

(Formerly EECS 241B.)

Space bandwidth product, superresolution, space-variant optical system, partial coherence, image processing with coherent and incoherent light, processing with feedback, real-time light modulators for hybrid processing, nonlinear processing. Optical computing and other applications. *Prerequisite:* ECE 140A or ECE 131C or equivalent. (W) Mr. Guest or Mr. Lee

**241C. Optical Modulation and Detection (4)**

(Formerly EECS 241C.)

Propagation of waves and rays in anisotropic media. Electro-optical switching and modulation. Acousto-optical deflection and modulation. Detection theory. Heterodyne detection, incoherent and coherent detection. *Prerequisite:* ECE 140A or ECE 131C or equivalent. (S) Mr. Lee or Mr. Yu

**241D. Optical Processes in Semiconductors (4)**

(Formerly EECS 241D.)

Absorption of radiation in semiconductors, photodetectors. Radiative transition and non-radiative recombination. Processes in p-n junctions (including both homojunctions and heterojunctions), semiconductor lasers and light emitting diodes. Superluminescence. Detectors. *Prerequisites:* ECE 220A; ECE 241C recommended; introductory quantum mechanics. (W) Mr. Yu or Mr. Wieder

**241E. Optical Fiber Communication (4)**

(Formerly EECS 241E.)

Optical fibers, waveguides, laser communication system. Modulation and demodulation; detection processes and communication receivers. *Prerequisites:* ECE 140A or ECE 131B or equivalent; introduction to communication. (S) Mr. Chang or Mr. Yu

**241F. Nonlinear Optics (4)**

(Formerly EECS 241F.)

Second harmonic generation (color conversion), parametric amplification and oscillation, photorefractive effects and four-wave mixing, optical bistability; applications. *Prerequisites:* ECE 241A, ECE 241C, or consent of instructor. (F) Mr. Lee or Mr. Guest

**242A. Advanced Acoustics I (4)**

(Formerly EECS 242A.)

Boundary value problems in vibrating systems, wave propagation in strings, bars, and plates. Fundamentals of acoustical transducers. *Prerequisite:* concurrent registration in 142AL recommended. Mr. Anderson

**242B. Advanced Acoustics II (4)**

(Formerly EECS 242B.)

Theory of radiation, transmission and scattering of sound with special application to ocean acoustics. *Prerequisites:* concurrent registration in 142BL recommended. ECE 242A or consent of instructor. Mr. Anderson

**242C. Advanced Acoustics III (4)**

(Formerly EECS 242C.)

Signal processing in underwater acoustics. Theory and hardware embodiments. *Prerequisites:* concurrent registration in 142CL recommended. ECE 242B or consent of instructor. Mr. Anderson

**243A-B. Optical Systems (4-4)**

(Formerly EECS 243A-B.)

Fundamentals of optical systems which provide visual information, including photographic and electronic imagery. Geo-

metrical, physical, and physiological optics; radiometry, photometry, colorimetry, atmospheric optics, visibility; coherence, spatial frequency, analysis, transfer functions; resolution, image evaluation, image reconstruction. Ultimate capabilities of optical systems. *Prerequisite:* consent of instructor. (W,S) Mr. Lee

**246A-B. Wave Propagation through Random Media (4-4)**

(Formerly EECS 246A-B.)

Theory of scintillations due to refractive-index fluctuations at radio wavelengths in the solar wind, the ionosphere, and the interplanetary medium, and at optical wavelengths in the earth's atmosphere. Connection between the refractive index spectrum, the angular spectrum, and the intensity spectrum. *Prerequisite:* consent of instructor. Mr. Rumsey

**248A. Tropospheric Radio Propagation (4)**

(Formerly EECS 248A.)

Angular spectra and their synthesis using the method of steepest descent. Reflection and refraction at the earth's surface. Edge diffraction. Diffraction round the curved earth. Refraction in the troposphere. Tropospheric duct propagation. Tropospheric scatter propagation. *Prerequisite:* consent of instructor. (F) Mr. Booker

**248B. Cold Plasma Waves (4)**

(Formerly EECS 248B.)

Mobility and susceptibility tensors for homogeneous magnetoplasma. Dispersion relation. Elliptic polarization and cross-connection phenomena for characteristic waves. Radio, hydromagnetic, quasi-longitudinal and quasi-transverse approximations. Field of antenna in a homogeneous magnetoplasma. Pulse radiation from a dipole for the entire electromagnetic spectrum. *Prerequisite:* consent of instructor. (W) Mr. Booker

**248C. Ionospheric Radio Propagation (4)**

(Formerly EECS 248C.)

Plane stratified isotropic ionosphere. Phase integral approximation. Reflecting stratum. Complex height. HF communications. Earth's curvature. Irregularities of ionization aligned along Earth's magnetic field. VHF scatter communication. Stratified non-isotropic ionosphere. Coupling between characteristic waves. ELF propagation in Earth-ionosphere cavity. Schumann resonances. *Prerequisite:* consent of instructor. (S) Mr. Booker

**250A. Random Processes (4)**

(Formerly EECS 250A.)

Random variables, probability distributions and densities, characteristic functions. Convergence in probability and in quadratic mean. Stochastic processes, stationarity, second order processes, wide sense stationarity. Processes with orthogonal and independent increments. Power spectrum and power spectral density. Stochastic integrals and derivatives. Spectral representation of wide sense stationary processes, harmonizable processes, moving average representations. *Prerequisites:* ECE 152C or equivalent or consent of instructor. (W) Mr. Lugannani

**250B. Random Processes (4)**

(Formerly EECS 250B.)

Convergence of sequences of distribution functions and characteristic functions, compact and weak convergence. Central limit theorem, Liapounov and Lindeberg-Levy theorem, infinitely divisible limit laws. Shot noise processes and generalized shot noise, Chernoff bound, Edgeworth series, saddle point expansions for probability distributions and densities. *Prerequisite:* ECE 250A or consent of instructor. (S) Mr. Lugannani

**251A. Digital Signal Processing I (4)**

(Formerly EECS 251A.)

Sampling: A/D and D/A conversion; discrete linear system theory, z-transforms; digital filters, recursive and nonrecursive designs, quantization effects; fast Fourier transforms, windowing, high speed correlation and convoluting; discrete random signals; finite word length effects. *Prerequisites:* ECE 152A-B-C or equivalent. (F) Mr. Hodgkiss

**251B. Digital Signal Processing II (4)**

(Formerly EECS 251B.)

Signal and multi-channel data processing in a time varying environment; adaptive filters; high resolution spectral estimation; linear prediction; adaptive beamforming. *Prerequisites:* ECE 251A-B or consent of instructor. (W) Mr. Hodgkiss



## FRONTIERS OF SCIENCE

### 251C. Digital Signal Processing III (4)

(Formerly EECS 251C.)

Signal and multi-channel data processing in a time varying environment; adaptive filters; high resolution spectral estimation; linear prediction; adaptive beamforming. *Prerequisite: ECE 251A-B or consent of instructor.* (S) Mr. Hodgkiss

### 252A. Introduction of Speech Processing (4)

(Formerly EECS 252A.)

Theories of speech production, analysis, perception and synthesis are covered. Speech production models, analysis techniques, and sound pattern of languages. Speech perception and synthesis include modeling, engineering perspective, synthesis-by-rules, and text-to-speech systems. *Prerequisite: ECE 152 or equivalent.* (W)

### 252B. Speech Communication Systems (4)

(Formerly EECS 252B.)

This course, continued from introductory course, discusses speech processing, encoding, and recognition. Speech enhancement, waveform encoding, analysis-synthesis encoding and other vocoders. Word recognition, continuous speech recognition, speaker authentication and speech understanding systems are covered. *Prerequisite: ECE 252A.* (S) Mr. Li

### 253A. Digital Image Processing I (4)

(Formerly EECS 253A.)

Image representations, models, quantization and sampling, 2-D randomfields, image transforms, compression and coding, model-based restoration and filtering, edge detection, feature extraction, scene segmentation, reconstruction from projections. *Prerequisites: ECE 152A-B-C, recommended: ECE 251A.*

### 254A-B-C. Detection Theory (4-4-4)

(Formerly EECS 254A-B-C.)

Hypothesis testing; detection of signals in white and colored Gaussian noise; Karhunen-Loeve expansion; estimation of signal parameters, maximum-likelihood detection; resolution of signals; detection and estimation of stochastic signals; applications to radar, communications, and optics. *Prerequisite: ECE 152C.* (F,W,S) Mr. Helstrom

### 256A-B. Time Series Analysis and Applications (4)

(Formerly EECS 256A-B.)

Recursive and nonrecursive prediction and filtering; Wiener-Hopf and Kalman-Bucy filters. Series expansions and applications. Time series analysis; probability density, covariance and spectral estimation. Inference from sampled-data; sampling theorems, equally- and non-equally-spaced data, applications to detection and estimation problem. *Prerequisites: ECE 250A-B, Math. 210D.* (Given in alternate years.) (F,W) Mr. Masry

### 257A. Multi-User Communication Systems (4)

(Formerly EECS 257A.)

M/G/1, G1/M/1 queues, imbedded chains. Ergodic theory of Markov chains, classification, ergodic theorems. Multiple access systems, random access protocols, capacity, stability, delay and control, reservation and hybrid schemes. *Prerequisites: ECE 152B, C or equivalent, ECE 159A.* Note: ECE 159A is an integral part of this course and should be taken in the fall quarter. (W) Mr. Rao

### 257B. Multi-User Communication Systems (4)

(Formerly EECS 257B.)

Markovian networks. Jackson's theorem. Communication networks. Topological design. Flow control; prevention of deadlock and throughput degradation. Delay, throughput power. Routing local global information, centralized, decentralized schemes, static, dynamic algorithms. Shortest path and minimum average delay algorithms. Comparisons. *Prerequisite: ECE 257A.* (S) Mr. Rao

### 258A-B-C. Communication Systems (4-4-4)

(Formerly EECS 258A-B-C.)

Fundamental concepts of information theory, including information measures, source encoding with and without distortion, channel encoding, noisy channel coding theorem. Digital communication theory including basic modulation techniques, performance of digital systems, effects of and equalization techniques for intersymbol interference, spread-spectrum communications. *Prerequisites: ECE 154A-B-C or consent of instructor.* (Will be offered every year.) (F,W,S) Mr. Milstein

### 259A-B-C. Information Theory and Digital Communication (4-4-4)

(Formerly EECS 259A-B-C.)

Information theory developed from the viewpoint of digital

communication engineering: basic parameters of entropy, mutual information and capacity; discrete source coding; characterization of basic channel models; block coding and error bounds; convolutional codes; maximum likelihood and sequential decoding and respective error bounds; source rate-distortion functions and source coding without and with memory. *Prerequisite: ECE 258A or consent of instructor.* (Given in alternate years.) (F,W,S) Mr. Viterbi

### 287A-B-C. Special Studies in Information Science (1-4)

(Formerly EECS 287A-B-C.)

Topics of special interest in information science to be presented by staff members and graduate students under faculty direction. Subject matter to be announced before each quarter. One to three hours' lecture. *Prerequisite: consent of instructor.*

### 288. Special Topics in Applied Physics (1-6)

(Formerly EECS 288.)

A course to be given at the discretion of the faculty at which topics of current interest in applied physics will be presented by visiting or resident faculty members. (S/U grades optional.) *Prerequisite: consent of instructor.*

### 289. Special Topics in Information Science (1-8)

(Formerly EECS 289.)

A course to be given at the discretion of the faculty at which topics of current interest in information theory or signal processing will be presented by visiting or resident faculty members. (S/U grades optional.) *Prerequisite: consent of instructor.*

### 290. Observatory Field Course (1-12)

(Formerly EECS 290.)

Methods of measurement, observation and data processing used at radio, radar, and optical observatories in astronomy and solar system physics; establishment and use of equipment for a current research investigation at an observatory; analysis and interpretation of result with a report. *Prerequisite: consent of instructor.*

### 291. Graduate Seminar in Applied Physics (2-2-2)

(Formerly EECS 291.)

Weekly discussion of current research literature. Staff

### 292. Graduate Seminar in Solar System and Space Physics (2-2-2)

(Formerly EECS 292.)

Research topics in radio astronomy and solar system physics. (S/U grades only.) Mr. Rickett

### 293. Graduate Seminar in Information and Computer Science (2)

(Formerly EECS 293.)

Research topics in information and computer science. Staff

### 294. Graduate Seminar in Applied Solid State Physics (2)

(Formerly EECS 294.)

Research topics in applied solid state physics and quantum electronics. Mr. Luo

### 295. Seminar in Cosmic Plasma Physics (2)

(Formerly EECS 295.)

A survey is given of this new approach to astrophysics that is based on the results of space research. Mr. Alfven

### 296. Graduate Seminar in Optical Signal Processing (2)

(Formerly EECS 296.)

Research topics of current interest in holography. Mr. Lee

### 298. Independent Study (1-16)

(Formerly EECS 298.)

Open to properly qualified graduate students who wish to pursue a problem through advanced study under the direction of a member of the staff. (S/U grades only.) *Prerequisite: consent of instructor.*

### 299. Research (1-16)

(Formerly EECS 299.)

(S/U grade only.)

### 501. Teaching (1-6)

(Formerly EECS 501.)

Teaching and tutorial activities associated with courses and seminars. Not required for candidates for the Ph.D. degree. Number of units for credit depends on number of hours devoted to class or section assistance. (S/U grade only.) *Prerequisite: consent of department chairman.*

## ENGLISH AND AMERICAN LITERATURE

See Literature.

## FRONTIERS OF SCIENCE

OFFICE: 1512 Humanities Undergraduate Library Building, Revelle College

These courses in the frontiers of knowledge are concerned with three kinds of frontiers:

1. Recent discoveries or breakthroughs in scientific research and in technology.
2. The frontiers between different sciences where the areas of human understanding depend on the interactions between two or more sciences or technologies, such as the many problems related to energy.
3. The frontiers between science and other human affairs, including the practical social problems where science and technology can contribute to a solution.

The Frontiers of Science courses are specifically designed to be used as a non-contiguous minor or as noncontiguous electives by non-science majors in Revelle College. They may also be used as electives and/or to fulfill requirements in other colleges (see relevant provost's office for details). With the approval of the appropriate faculty adviser, certain courses may also be used in partial fulfillment of requirements for a science minor.

**All Frontiers of Science courses presuppose some familiarity with college-level science and mathematics. For that reason, these courses require junior or senior standing and either the equivalent or completion of the Revelle general-education requirements in natural science (biology, chemistry, calculus, and physics) or the consent of the instructor.**

Freshmen and sophomores (or others) who wish to take science courses for which there are no prerequisites should also see Earth Sciences 1 and 4, Physics 5, and lower-division courses organized for the non-major by the Department of Biology. A maximum of two such lower-division courses can be used in partial fulfillment of an *approved* Frontiers of Science minor. However, Revelle students who elect to take noncontiguous science



electives in lieu of an approved minor may use three noncontiguous lower-division science courses.

## Courses

### 113. Frontiers of Modern Medicine (4)

An integrated series of lectures and readings covering the modern frontiers of medical research. Lectures to be given by members of the faculty of the School of Medicine to acquaint the student with ongoing problems in modern health research. (S)

### 140. Consciousness in Animals and Humans (4)

(Same as Anthro. 173.) This course strives to look at the issue of consciousness as it has been modified by recent advances in several disciplines. Using a comparative perspective, the evidence from animal behavior raises interesting questions about what consciousness is, the uniqueness of human consciousness, and the characteristics that are a part of the animal-human continuum. The course would draw from faculty expertise in several departments. *Prerequisite:* AN 10 or AN 25 or any introductory course in evolution/animal behavior or consent of instructor. (S)

### 141. Frontiers of Meteorology (4)

Meteorology as a physical science. Weather forecasting and its limits. Weather modification. Climate variation, past and future. Man's effect on climate (CO<sub>2</sub>, nuclear winter). Air pollution meteorology. Acid rain. The ozone problem. (W)

### 142. Man's Impact on Global Environment (4)

A survey of environmental sciences as they deal with the global changes introduced by human activities: (1) Principles of ecology and applications to problems of habitat modification, pollution of lakes and estuaries, and overhunting. (2) Principles of climatology and applications to problems of climate modification. (3) Principles of modeling and forecasting and applications to science planning. *Prerequisite:* Revelle lower division science or equivalent. *Physics and chemistry required.* (S)

## GREEK LITERATURE

See Literature.

## HEALTH CARE — SOCIAL ISSUES

OFFICE: Interdisciplinary Programs,  
Building 405, Matthews Administrative  
and Academic Complex, 534-1704

Health care — social issues is an interdisciplinary minor designed to enhance students' competence in analyzing complex social and ethical implications and ramifications of health care issues, policies and systems, and students' ability to understand how the economy, culture, technology, and political and psychological processes influence modern health care. Although it is administered by Warren College, it is available to all UCSD students with a general interest in health care as well as to students considering health care careers. This minor offers UCSD students the opportunity to examine health

care-related issues from the perspectives of a wide range of disciplines including: anthropology, economics, philosophy, political science, psychology, sociology, urban studies, and science and technology. By bringing together course work from these academic departments, this interdisciplinary curriculum offers a breadth of intellectual experience that enhances students' undergraduate education and their preparation for professional and post-graduate education in health care professions.

Students should consult an academic adviser in their college provost's office to determine how the health care — social issues minor can best meet their college's graduation requirements. Students who complete the health care — social issues course work but do not use it as a minor may elect to have a special transcript notation certifying completion of the program. Transcript Notation Requests must be obtained from and approved by the Interdisciplinary Programs Office. Declarations (forms officially designating health care — social issues a minor and listing the specific course work selected by the student) and petitions (forms requesting changes in or exceptions to course requirements) for the health care — social issues minor must first be reviewed and approved by the coordinator of Interdisciplinary Programs and then by the student's college academic advising office.

Students are strongly urged to supplement the health care — social issues minor with a health-related internship. The Academic Internship Program, located in Building 406, Matthews Administrative and Academic Complex, offers internship placements in clinical settings and with medical research teams that provide valuable experience, career clarification, and an opportunity to apply theories learned in course work. Juniors and seniors with at least a 2.5 overall grade-point average are eligible and can earn from four to sixteen units of academic credit for the internship experience.

Resource materials, information, workshops, and other supplementary programs for students considering health care careers are also available through the Career Services Center, the student Health Issues and Professions Organization (HIPO), and faculty advisers in the academic departments. Further information on these programs and activities is available at the Interdisciplinary Programs Office, 405 Matthews Administrative and Academic Complex.

## Health Care — Social Issues Minor Requirements

The minor consists of six courses (two required and four electives, chosen from a list of approved courses). At least four courses (Philosophy 122, which is required, and three electives) must be taken at the upper-division level. Upper-division electives must be chosen from a department other than that of the student's major. For full descriptions of the following courses, please see departmental listings.

### Required Courses

Sociology 40, Sociology of Health Care Issues, and  
Philosophy 122, Bio-Medical Ethics

**Elective Course Options** — Four courses to be chosen from the following list. At least three must be upper-division and from a department other than that of the student's major.

#### Anthropology:

- 10 — Introduction to Physical Anthropology
- 22 — Introduction to Cultural Anthropology
- 128 — Anthropology of Medicine
- 155 — Models of Madness
- 160 — Human Behavioral Biology
- 163 — Anthropology of the Body
- 178 — Healing Arts in Cultural Perspective
- 191 — Seminar in Medical Anthropology

#### Economics:

- 1A, 1B — Elements of Economics
- 138 — Economics of Health  
(NOTE: For students taking Economics 138, one upper-division elective course may be replaced by Economics 1A or 1B.)

#### Philosophy:

- 124 — Contemporary Moral Issues
- 127 — Professional Ethics
- 185 — Special Topics (prior approval of topic required)

#### Political Science:

- 10 — Introduction to Political Science: American Politics
- 162AC — Technology and Society (cross-listed as STPA 105C)
- 164A — The Politics of Medicine and Health
- 164B — Politics of Environmental Health

#### Psychology:

- 1 — Psychology

## HISTORY

- 2 — General Psychology: Biological Foundations
- 16 — Alcohol and Drug Abuse: From Cells to Society
- 60 — Introduction to Statistics
- 104 — Introduction to Social Psychology
- 124 — Human Mental Illness
- 139 — Brain Damage and the Mind
- 140 — Clinical Interviewing
- 155 — Social Psychology and Medicine
- 163 — Abnormal Psychology
- 168 — Psychological Disorders of Childhood
- 179 — Drug Addiction and Mental Disorder

### Science, Technology, and Public Affairs:

- 105C — Technology and Society (cross-listed as Political Science 162AC)
- 181 — Elements of International Medicine

### Sociology:

- 1A, 1B — The Study of Society
- 135 — Sociology of Health and Illness
- 136A — Sociology of Mental Illness: Historical
- 136B — Sociology of Mental Illness: Contemporary

### Urban Studies and Planning:

- 41 — Introduction to Human Care Services
- 143 — Orientation to Health Care Organization
- 144B — Preventive Health Care
- 145 — Aging: Social and Health Policy Issues
- 146 — Case Studies in Health Care Programs: Children and Families
- 147 — Case Studies in Health Care Programs: The Poor and Underserved
- 148 — Health Policy and Planning

### Recommended Internship Experience

Health care-related internship (AIP 197): To be arranged at least one quarter in advance through the Academic Internship Program, 406 Matthews Administrative and Academic Complex. Clinical and research placements are available.

## HEBREW LITERATURE

See Literature.

## HISTORY

OFFICE: Room 5024, Humanities and Social Sciences Bldg., Muir College

### Professors:

Heraclio Bonilla, Ph.D.  
Stanley Chodorow, Ph.D.\*  
John Dower, Ph.D., *Endowed Chair, Japanese Studies*  
David Noel Freedman, Ph.D., *Endowed Chair, Biblical Studies*  
Judith M. Hughes, Ph.D.  
Thomas Metzger, Ph.D.  
Allan Mitchell, Ph.D.  
Alden Mosshammer, Ph.D.†  
Michael E. Parrish, Ph.D. (*Chairman*)  
Edward Reynolds, Ph.D.  
David R. Ringrose, Ph.D.  
Robert C. Ritchie, Ph.D.  
Ramón Eduardo Ruíz, Ph.D.

### Adjunct Professors:

Paul Drake, Ph.D.  
Wadie Jwaideh, Ph.D.  
Peter Smith, Ph.D.  
Leften Stavrianos, Ph.D.

### Professors Emeritus:

John S. Galbraith, Ph.D.  
H. Stuart Hughes, Ph.D.  
Gabriel Jackson, Ph.D.  
Earl Pomeroy, Ph.D.

### Associate Professors:

Thomas Dublin, Ph.D.  
Robert S. Edelman, Ph.D.  
Steven Hahn, Ph.D.†  
Rachel Klein, Ph.D.  
David S. Luft, Ph.D.††  
John A. Marino, Ph.D.  
Michael P. Monteón, Ph.D.  
Paul G. Pickowicz, Ph.D.  
Eric Van Young, Ph.D.†

### Assistant Professors:

Michael A. Bernstein, Ph.D.  
Ramón Gutiérrez, Ph.D.  
Julie Saville, Ph.D.†††

### Lecturer with Security of Employment:

Ping Hu

†Leave of absence, fall 1987

††Leave of absence, winter, 1988

†††Leave of absence, spring, 1988

\*\*\*Leave of absence, fall, winter, 1987/88

\*\*Leave of absence, winter, spring, 1988

\*Leave of absence, all year

## The Major Program

Students majoring in the Department of History are required to take (1) three quarters of lower-division work and (2) a minimum of twelve upper-division courses in history. The upper-division courses must be distributed among the three fields offered by the department. Students must

maintain a C average in history courses to graduate in this major.

## PREREQUISITES

1A. Latin America: Iberian Empires and Colonial Frustrations

and

1B. Latin America in the Shadow of the British Empire

and

1C. Latin America: U.S. and Struggles for Independence

or

History 2A-2B-2C United States History

or

History 3A-3B-3C European Society and Social Thought

or

History 7A-7B-7C Race and Ethnicity in the United States: A Comparative Study

or

History 24 Origins and Consequences of Underdevelopment, History 25 China and the West in Modern Times, History 26 Third World: Nationalist Rebellions and Economic Development, or History 27 Africa.

History 7A-7B-7C and 24-25-26-27 are cross-listed with Third World Studies.

Lower-division combinations including History 29, 31, 32, or 80A-80B will be considered by the department as part of the prerequisite for the major upon submission of a formal petition.

NOTE: Transfer students who have taken a two-semester or three-quarter, lower-division history sequence elsewhere may petition to waive the lower-division requirement for the major.

## Fields

1. Europe
2. Western Hemisphere (United States and Latin America)
3. Non-Western History (Africa and Asia)

Students will fulfill a distribution requirement as follows:

1. Seven quarter-courses in one of the three fields;
2. Three quarter-courses in a field other than the primary one;
3. Two quarter-courses in one of the remaining fields.

Students who wish to concentrate on a field of history that addresses more than one geographical area (e.g., economic, legal, or social history) should draw up a proposed plan of study in consultation with their advisers and submit it for departmental review as early as possible.

Students are expected to diversify their programs chronologically as well as geographically. At least two of the twelve upper-division courses must concentrate on a period prior to 1800. Courses that satisfy this requirement are designated by the symbol(+).

History majors are urged to take courses in related disciplines to enhance their understanding of the historical process and to strengthen their preparation in the major. Such courses should be selected in consultation with an adviser.

## Honors

The department offers a special program for outstanding students. Candidates for history honors are chosen during the spring quarter among juniors in history who have taken at least four upper-division courses in the department. Juniors with a 3.5 GPA in history (3.0 overall) are eligible to apply. Admission to the program is based upon the student's academic record and the recommendation of professors familiar with the student's work. Interested candidates should complete the application form (available in the Department of History office) prior to April 1.

The honors program consists, in addition to regular course work in the department, of a colloquium in historiography offered in the fall quarter of the senior year and a program of independent study leading to the completion of an honors essay on a topic of the student's choice. During the fall quarter of the senior year candidates select a topic and begin preliminary work on the honors essay in consultation with a major field adviser (History 196A). During the winter quarter the student pursues a course of independent study devoted to the completion of the honors essay (History 196B). The award of history honors is based on satisfactory completion of the colloquium in history and the honors essay. Students are expected to maintain an average of 3.5 or better in all work taken within the department. Honors candidates must include at least three colloquia in their regular course work.

Candidates for history honors should organize their work as follows:

1. Six quarter-courses in one of the major fields offered by the department, of which two or three should be colloquia;
2. Three quarter-courses in a field other than the primary one, of which one course should be a colloquium unless

the requirement of three colloquia has been satisfied in the major field;

3. History 196Q. Colloquium in History;
4. History 196A-B. History Honors — Honors Essay.

## Minor in History

The minor in history consists of at least six courses, of which not more than three may be lower-division. There is no specific distribution requirement, but the courses must be selected in such a way as to constitute a coherent program. Prospective history minors should consult with a departmental adviser for assistance in drawing up an appropriate plan of study.

## Education at Home Program (EHP)

In the winter quarter 1988, the UCR campus will continue the Education at Home Program (EHP), for those students with special interest in early American history and culture. Those selected for participation in this program will spend nine weeks in Williamsburg, one in Philadelphia, and a concluding week in Washington D.C. *This program is open to all undergraduates from any campus in the UC system. With the prior approval of their graduate adviser, graduate students may also apply.* Registration (through the Riverside campus) will be made for the following three courses in the Department of History: 157, 158, and 159. Special arrangements for additional independent study (maximum of four units) may be made with the student's home campus. For further information, brochures or application forms, call Susan Braddock at (714) 787-3820. Preference is given to applications received by June 30; final application deadline is November 1.

## The Graduate Program

### Master's Degree Program

The Department of History offers master's degrees in the fields of modern European history (1500 to the present), Latin American history, and United States history. The department also provides the opportunity for students to design special M.A. programs in areas such as medieval Europe, Africa, and China. (See details below.) Applicants must submit their academic records, three letters of recommendation, Graduate Record Examination scores (aptitude only), and one or two papers written for history courses. Ordinarily, those admitted have at least a 3.0 grade-point average, with a higher average in history and related subjects. Students

wishing information regarding the possibility of part-time M.A. study should consult the department's graduate coordinator. The deadline for application is January 15. Normally, master's students do not receive financial aid from the department or the university, except in circumstances where funds are not utilized for support of Ph.D. candidates.

**General Requirements:** Candidates for the master's degree are expected to finish the program in one academic year of full-time study or two years of part-time work. The program requires completion of thirty-six units, of which at least twenty units must be in colloquia and seminars. Master's students may enroll in a research seminar offered for Ph.D. students with the permission of the instructor. In addition to course requirements, students must pass a comprehensive oral examination. Students in European, Latin American history, and certain special areas must demonstrate reading knowledge of at least one foreign language relevant to their course work.

### Area of Concentration: Europe

Candidates for the M.A. degree in European history pursue a program concentrating on the impact of industrialization on European society. In addition to general training in the history of modern Europe, the program provides background in earlier European history in order to place industrialization in perspective. Some training in a discipline other than history is also recommended. The requirement of nine courses (thirty-six units) is normally distributed as follows:

- I. History 208A-B-C. Central Problems of European History: 1500-1945. All entering graduate students in European history take these courses.
- II. Two courses in pre-industrial Europe.
- III. Two courses in industrial Europe.
- IV. A Graduate Research Seminar.
- V. One course in a discipline other than history, if relevant to the student's program.

### Area of Concentration: Latin America

This program offers the student a general preparation in the history of Latin America. Students will have the opportunity to specialize in Cuba, Mexico, Chile, Peru, socioeconomic history, and other important aspects of Latin American history. Advanced work in another discipline related to Latin America may also be in-

## HISTORY

cluded in the program. Thirty-six units normally should be distributed as follows:

- I. Six graduate seminars in Latin American history.
- II. Three other courses related to Latin America in history or in other disciplines.

### Area of Concentration: United States

This area of concentration offers the M.A. candidate a broad grounding in the literature of American history from the colonial period to the present. In addition, students specialize in a topical field of their own choosing. Training in a related discipline outside of history is encouraged. The requirement of nine courses (thirty-six units) is ordinarily distributed as follows:

- I. History 250A-B-C. The Literature of American History. These colloquia are required of all entering graduate students in American history.
- II. Two courses in a single topical field — diplomatic, economic, social and ethnic (including urban) history, history of the South, or legal and constitutional history.
- III. Four additional courses chosen in consultation with the student's adviser. Two of these may be in a related field outside the department.
- IV. At least six of the nine courses must be colloquia or graduate-level courses. Students may take directed readings, research seminars, or the 250 series to meet this requirement.

### Special M.A. Program

Students who wish to work in specific areas, such as medieval Europe, Africa, China, or other areas, can develop an M.A. program in conjunction with an appropriate faculty member and petition the department for approval.

### Ph.D. Program

**Admission:** The Department of History offers the doctor of philosophy degree in the fields of European history, Latin American history, and United States history.

Applicants for admission to these programs must submit their academic record, three letters of recommendation, Graduate Record Examination scores (aptitude only), and one or two papers, preferably written for history courses. The minimum grade-point average for admission is 3.0, with a higher average in history and related subjects. Proficiency in a foreign language is not a requirement for ad-

mission, but the department urges prospective applicants to begin study of at least one foreign language relevant to the proposed area of concentration as early as possible in their academic careers. With very few exceptions, students are expected to begin their programs in the fall quarter. The deadline for application is January 15.

**Fields of Study:** During the first year of residence each student, after consulting with a graduate adviser in the area of concentration, selects one major field of study and two minor fields. Within a major field the student should indicate a special interest from which the dissertation may develop. The first minor is ordinarily a supplementary field within the student's area of concentration, while the second minor is a complementary field outside the area of concentration. The basic programs of study are as follows:

## I. EUROPEAN HISTORY

### A. Major Fields

1. Modern Europe with a specialty in England, Spain, France, Germany, Italy, social history, economic history, diplomatic history, or intellectual history.
2. Early Modern Europe with a specialty in expansion of Europe or any of the above.
3. Medieval Europe with a specialty in political theory, canon law, or the political history of the eleventh-thirteenth centuries.

### B. First Minor

Any of the following fields may be selected provided that the study concentrates on a chronological period outside the major.

1. Classical Greece and Rome
2. Medieval Europe
3. Early Modern Europe
4. Modern Europe
5. England
6. Russia

### C. Second Minor

1. A geographic area outside of Western Europe
2. Expansion of Europe
3. A related discipline

## II. LATIN AMERICAN HISTORY

### A. Major Fields

1. The national period of Latin America with a specialization in one country (usually Argentina, Chile, Cuba, or Mexico) or in socioeconomic history.

2. Colonial Latin America with an emphasis on political institutions or socioeconomic history.

### B. First Minor

The student should select either the national period or the colonial period as a chronological supplement to the major.

### C. Second Minor

1. Spain, U.S., another geographic area outside Latin America, expansion of Europe, or
2. An area or discipline related to the student's dissertation or preparation for university teaching.

## III. UNITED STATES HISTORY

### A. Major Fields

1. Colonial and early American period in 1789
2. National period, 1789-1877
3. Modern America, 1877 to present
4. Diplomatic history
5. Economic history
6. Social history
7. Legal and constitutional history
8. History of the South
9. Southwest, Borderlands, or Chicano history

### B. First Minor

1. Any of the fields listed above. Of the two fields required in United States history, one must be a chronological field.
2. Ethnic-urban history

### C. Second Minor

1. A geographic area outside the United States
2. A related discipline

NOTE: The department also offers graduate work in African and Chinese history. When appropriate, students may select minor fields in these areas.

### Ph.D. and M.A. Language Requirements:

1. Ph.D. candidates in European history must demonstrate competence in two foreign languages. Ph.D. candidates in United States or Latin American history and M.A. candidates in European or Latin American history must demonstrate competence in one foreign language. Additional languages appropriate to the special field of study may be required by the Graduate Committee, in consultation with the student's major-field adviser. Lan-

guage requirements for candidates in fields other than European, Latin American, or United States history will be set by the Graduate Committee, in consultation with the student's major-field adviser.

2. Students may satisfy the foreign language requirement in any of the following ways:
  - 2.1 By achieving, for Ph.D. candidates, a score of 600 or better in one language and 550 or better in a second language, if required, and for M.A. candidates a score of 550 or better on the Graduate School Foreign Language Test administered by the Educational Testing Service;
  - 2.2 By completing with a grade of B- or better in each term a two-year, lower-division sequence in the language approved by the Graduate Committee;
  - 2.3 By completing with a grade of B- or better in each term a one-year, upper-division sequence in the language approved by the Graduate Committee;
  - 2.4 For languages not covered by the GSFLT program, the requirement may be satisfied either by options 2.2 or 2.3 hereinabove or by passing a special examination in the language which shall be administered by the Graduate Committee.
  - 2.5 With reference to 2.2 and 2.3 hereinabove, such sequence must have been completed within two years of the time that request is made to the Graduate Committee for certification of competence. Courses may have been taken either at UCSD or, with the approval of the Graduate Committee, at another institution.

Where required, students must pass at least one foreign language examination by the end of the first year of study. Failure to meet this requirement is grounds for dismissal from the program. Students may not take the first minor field examination before completing one language requirement. No student may take the oral qualifying examination before completing all language requirements.

**Course Work:** A normal full-time program consists of twelve units per quarter. A maximum of four units may be in apprentice teaching. Students are expected to complete the following minimum of formal courses prior to their examinations:

two two-quarter research seminars, (three, in the case of Latin American History), and eight quarters of colloquia or directed reading. Under certain circumstances, when appropriate colloquia are not available, students may substitute upper-division undergraduate courses for colloquia in the minor fields, with extra study required. Students are encouraged to take at least one colloquium or research seminar in their major field during the initial year of graduate study.

**Part-time Study:** Students who enroll in fewer than twelve graduate or upper-division units per quarter are considered part-time students. Part-time study may be pursued in several masters' programs and a few Ph.D. programs at UCSD. Approval for individual students to enroll on a part-time basis may be given for reasons of occupation, family responsibilities, or health. Individuals who are interested in part-time study and meet the above qualifications should inquire of the department about opportunities for part-time study. Part-time students must satisfy the same admission requirements as full-time students and are eligible, at the discretion of the department, for 25 percent time teaching or research assistantships. Students who are approved by the dean of Graduate Studies and Research for enrollment in a program of half-time study or less (maximum six units) may be eligible for a reduction in fees. All other students pay the same fees as full-time students.

**Apprentice Teaching and Research:** As preparation for an academic career, Ph.D. candidates in history are encouraged to serve as teaching assistants. In certain cases, a student may instead participate in some special research program.

**Examinations:** Ph.D. candidates must take at least one examination in the spring of their second year and complete all examinations by May of their third year. Minor field examinations are written; the major field examination is oral. In each minor field, one professor, in consultation with colleagues, will compose and grade the written examination. An oral examination may be required if the student's performance is in doubt. The examiner should be identified at least three months before the examination.

Students who wish to delay completion of their examinations beyond the fall quarter of the third year must petition the Graduate Committee for an exception. Students who fail either their major or minor

field examinations may petition the Graduate Committee for permission to repeat it at the next scheduled examination period. A second failure results in automatic dismissal.

An M.A. degree may be awarded to continuing Ph.D. students on one of the following bases:

1. Successful completion of the qualifying examinations for the Ph.D.
2. Completion of the course work equivalent to that required for the M.A. (including a graduate seminar) and an oral examination.

Note: Students who wish to receive an M.A. must apply for candidacy during the first two weeks of the quarter in which they expect to receive their degree.

**Dissertation:** Upon completion of the examinations and advancement to candidacy, the student writes a dissertation under supervision of a professor. The dissertation must be completed no later than six years from the beginning of the program. Normally, the dissertation should not exceed 250 pages, notes included. The student will defend the thesis before a doctoral committee composed of five or six professors, of which three are members of the history faculty.

The various requirements noted above apply to students who have done no previous graduate work in history. If a candidate has completed some graduate work before entering UCSD, there may be appropriate adjustments in the course work. Nevertheless, all candidates are expected to meet language requirements; to pass field examinations; to complete a dissertation; and to defend the thesis.

**Financial Support:** There are four types of financial aid available to graduate students in the Department of History; fellowships, research assistantships, teaching assistantships, and readerships. Graduate students are eligible for one or a combination of the four forms of financial support for up to six years while in the program. Fellowships and research assistantships are granted by the Office of Graduate Studies and Research on the recommendation of the Graduate Committee. Readers are appointed by the department upon recommendation of the professor for whose course the student wishes to read. Students should, therefore, apply directly to the professor concerned. Appointments are not renewed automatically, but are approved by the department on a yearly basis. The Office of Graduate Studies and Research grants



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partial remission of fees for nine quarters after advancement to candidacy ("normative time") if the student is advanced to candidacy by the end of the third year. (If the student delays advancement, the amount of normative time is reduced accordingly.) Upon expiration of normative time the student must complete the dissertation or resume full payment of fees.

## Courses

The Department of History regularly participates in several interdisciplinary programs offered at the university: the Humanities sequence (Revelle College), Cultural Traditions (Muir College), Third World Studies (Third College), Chicano Studies, Chinese Studies, Classical Studies, Italian Studies, German Studies, and Judaic Studies. Students should also consult the listings of these programs elsewhere in the catalog.

*Please check the schedule of classes each quarter to determine which of the courses listed below is offered.*

### Upper Division

Completion of a college writing requirement is a prerequisite for admission to upper-division history courses. Immediately following the names of the instructors, the symbols (E), (NW), or (W) appear. They represent: (E) = European; (NW) = Non-Western; (W) = Western. A cross (†) denotes courses that fulfill the pre-1800 period requirement.

### Lower Division

#### 1A. Latin America: Iberian Empires and Colonial Frustrations (4)

Lecture-discussion survey describing the origins of highly stratified societies with a tendency to authoritarian rule. It traces such basic problems as mass poverty, racial prejudice, and undemocratic politics to the legacies of three centuries of Spanish and Portuguese rule. Van Young (W)†

#### 1B. Latin America in the Shadow of the British Empire (4)

Lecture-discussion survey describing the evolution of highly stratified societies with a tendency to authoritarian rule. Traces the impact of Britain as world power in the region from the 1780s to Britain's decline in the 1930s. Discusses the impact of capitalism and nationalism on preindustrial societies in explaining the persistence of social injustice in a period of "progress." Monteon (W)

#### 1C. Latin America: U.S. and Struggle for Independence (4)

Lecture-discussion survey dealing with attempts to end the persistence of highly stratified societies and patterns of social injustice. Traces the impact of the U.S. on twentieth-century Latin America, focusing on revolutionary attempts to break with old evils and the dominance of the northern colossus. Ruiz (W)

#### 2A-B-C. United States History (4-4-4)

A year-long lower-division course that will provide students with a background in United States history from colonial times to the present, concentrating on social, economic, and political developments. (Satisfies Muir College humanities requirement and American History and Institutions requirement.) Staff.

#### 3A-B-C. European Society and Social Thought (4-4-4)

An examination by lectures and discussions of European social development and social theory from the later medieval period to the twentieth century. Important writings will be considered both as responses to and as provocations for social change in Europe. (Satisfies Muir College humanities requirements and the Revelle College additional humanities requirement.) Staff.

#### 7A. Race and Ethnicity in the United States (4)

(Same as Third World Studies 7A.) A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be slavery, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America. (Satisfies Third College general-education requirement.) Staff.

#### 7AW. Race and Ethnicity in the United States (6)

(Same as Third World Studies 7AW.) A writing-intensive version of History 7A that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. (Satisfies Third College writing requirement.) Staff.

#### 7B. Race and Ethnicity in the United States (4)

(Same as Third World Studies 7B.) A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be the Asian-American and white ethnic groups, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America. (Satisfies Third College general-education requirement.) Staff.

#### 7BW. Race and Ethnicity in the United States (6)

(Same as Third World Studies 7BW.) A writing-intensive version of History 7B that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. The focus will be on Asian and European immigration to the United States. (Satisfies Third College writing requirement.) Staff.

#### 7C. Race and Ethnicity in the United States (4)

(Same as Third World Studies 7C and Chicano Studies 7C.) A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be the Mexican-American, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America. (Satisfies Third College general-education requirement.) Staff.

#### 7CW. Race and Ethnicity in the United States (6)

(Same as Third World Studies 7CW.) A writing-intensive version of History 7C that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. Of central concern will be the Mexican-American, race, oppression, mass migration, ethnicity, city life in industrial America and power and protest in modern America. (Satisfies Third College writing requirement.) Staff.

#### 19A-B-C. The Greco-Roman World (4-4-4)

(Same as Cla. Stu. 19A-B-C and Lit/Gen. 19A-B-C.) An introductory study of the Greco-Roman world, its literature, myth, philosophy, history, and art. (Cross-listed with Literature/Classical Studies.) Staff.

#### 24. Origins and Consequences of Underdevelopment (4)

(Same as Third World Studies 24.) The history of the Third World peoples of Asia, Africa, and Latin America is surveyed from the fifteenth century to 1900. It traces the origins of European empires, the interrelationship between these empires and the process of underdevelopment, the meaning of imperialism as an experience shared by Third World peoples, and the beginning of indigenous resistance to imperialism. Reynolds

#### 24W. Origins and Consequences of Underdevelopment (6)

(Same as Third World Studies 24W.) A writing-intensive version of History 24 that teaches writing and analytical skills in conjunction with the study of the history of the Third World peoples of Asia, Africa, and Latin America (surveyed from the fifteenth century to 1900). (Satisfies the Third College writing and societal analysis requirements.) Reynolds

#### 25. China and the West in Modern Times (4)

(Same as Third World Studies 25.) This course surveys the eighteenth-, nineteenth-, and early twentieth-century history of China. Special emphasis is placed on the nature of the various Chinese responses to the political, economic, and cultural impact of the West on traditional Chinese society. Pickowicz

#### 25W. China and the West in Modern Times (6)

(Same as Third World Studies 25W.) A writing-intensive version of History 25 that teaches writing and analytical skills in conjunction with a survey of eighteenth, nineteenth and early twentieth century history of China. (Satisfies the Third College writing and societal analysis requirements.) Staff

#### 26. Third World: Nationalist Rebellions and Economic Development (4)

(Same as Third World Studies 26.) The course surveys the attempts of nationalist movements to seize power in Africa, Asia, and Latin America, and to then design economic programs capable of simultaneously fomenting growth and a more equitable distribution of income. The means by which such movements gain power will take up the first part of the course; the second part is devoted to their economic problems. The revolutions in China, Cuba, Vietnam, Iran, and Chile are among the cases that will be examined in detail. Monteon

#### 26W. Third World: Nationalist Rebellions and Economic Development (6)

(Same as Third World Studies 26W.) A writing-intensive version of History 26 that teaches writing and analytical skills. The course surveys the attempts of nationalist movements to seize power in Africa, Asia, and Latin America, and to then design economic programs capable of simultaneously fomenting growth and a more equitable distribution of income. (Satisfies the Third College writing and societal analysis requirements.) Monteon

#### 27. Africa (4)

(Same as Third World Studies 27.) The course explores the emergence of modern African states as independent nations. It examines the causes and nature of African nationalistic rebellions against colonial rule, the process of independence, post-independence, problems such as neocolonialism, military coups, and economic development. Reynolds

#### 29. Women in American Thought and Culture (4)

An exploration of the relationship between changing popular attitudes about women and the emergence of feminist theories. Topics will include women in colonial America, the culture of domesticity, emergence of the Women's Movement, images of feminine beauty, women and progressive reform, women in the movies, the impact of World War II, contemporary feminist theories. Readings will be drawn from history and literature. Klein (W)

#### 31. Environment and Economy in Historical Perspective, Part I (4)

Interaction of man and the environment. Disease, geography, technology, and climate as determinants. Man's culture and impact on his ecological context from various past and present contexts. The course emphasizes the historical, archaeological, and anthropological record and social-science models of explanation. Ringrose

#### 32. Environment and Economy in Historical Perspective, Part II (4)

Interaction of man and the environment. Disease, geography, technology, and climate as determinants. Man's culture and impact on his ecological context from various past and present contexts. The course emphasizes ethical positions and attitudes to environment, the possible uniqueness of the West, and the environmental movement of the last century. Ringrose

#### 80A. Japan to 1600 (4)

This introductory survey covers Japanese history and culture from earliest times through the period of "high feudalism" and the first encounters with Europeans in the 1500s. The approach is multidisciplinary, drawing together institutional developments, economic growth, art, religion, and literature. Dower

#### 80B. Japan Since 1600 (4)

This survey begins with Japan's centuries of feudal isolation under the Tokugawa shoguns (1600-1868), and traces the country's emergence as a modern nation and imperialist power, culminating in World War II. Dower

### Upper Division

#### 100. The Ancient Near East and Israel (4)

The history of Israel is studied in the context of ancient Near Eastern civilization as a whole. Topics include the birth of civilization in Southern Mesopotamia, the Assyrian and Babylo-

nian empires, and the rise of Persia as well as Israel in the Biblical period (1900-445 B.C.). (NW) †

**101A. Early Greece (4)**

The social, political, and cultural history of the ancient Greek world from the Bronze Age to the Persian Wars (2000-480 B.C.). Mosshammer (E) †

**101B. Greece in the Classical Age (4)**

The social, political, and cultural history of the ancient Greek world from the Persian Wars to the death of Alexander the Great (480-323 B.C.). Mosshammer (E) †

**101Q. Alexander the Great and the Hellenistic World (4)**

See *Colloquia* below.

**102A. The Roman Republic (4)**

The political, economic, and intellectual history of the Roman world from the foundation of Rome to the time of Julius Caesar. Mosshammer (E) †

**102B. The Roman Empire (4)**

The political, economic, and intellectual history of the Roman world from the time of Julius Caesar to the death of Constantine. Mosshammer (E) †

**102Q. The Decline of Rome (4)**

See *Colloquia* below.

**103A-B. Medieval England (4-4)**

Course covers the history of England from Roman times to the fourteenth century. Students will study the development of English government, society, and culture. Chodorow (E) †

**104A-B. The Rise of Europe (4-4)**

The development of European society and culture from the decline of the Roman Empire to 1300. *Prerequisite: Humanities sequence or its equivalent.* Chodorow (E) †

**104Q. Special Topics in Medieval History (4)**

See *Colloquia* below.

**105A. Early Renaissance Italy: Dante to the Medici, (1300-1494) (4)**

The economic and political transformation of late-medieval Italy from the heyday of mercantile expansion before the plague to the dissolution of the Italian state system with the French invasions of 1494. Special focus upon family, associational life and factionalism in the city, the development of the techniques of capitalist accumulation, and the spread of humanism. Marino (E) †

**105B. Late Italian Renaissance: Age of Michelangelo, (1494-1564) (4)**

The political analysis of Machiavelli and Guicciardini establishes the lines of inquiry to examine society and culture in Italy from the high Renaissance to the Council of Trent. The life of artists like Michelangelo and Benvenuto Cellini reflect the deeply felt political and spiritual crisis confronting the Italian states in an age of new monarchies. Marino (E) †

**105Q. History of Early Modern Europe (4)**

See *Colloquia* below.

**106A. Reformation Europe, 1494-1598 (4)**

The intellectual and social history of the Reformation and Counter-Reformation from the French invasions to the Edict of Nantes. Emphasis is upon reform from below and above, the transformation of grass-roots spirituality into institutional control. Marino (E) †

**106B. Politics Italian Renaissance Style (4)**

The purpose of this course is to examine the relationship between rhetoric and history. Two great contemporary Renaissance figures grappled with the problems of the citizen and the state, ideal and reality during the French invasions of Italy. What was the Renaissance state? What was the relationship between *virtu* and *fortuna*? What were Machiavellian politics? How were they modified by Guicciardini? Why is their political science the origin of modern political thought? Lecture-discussion of major historical texts of the Renaissance with special attention to war and diplomacy in the formation of modern European politics. Marino (E) †

**106Q. Instant History: The Rhetoric of Contemporary History (4)**

See *Colloquia* below.

**107. Europe in the Eighteenth Century (4)**

(Same as Humanities 107.) A lecture-discussion course focusing on Europe from 1680-1789. Emphasis is upon the social and intellectual history of France, Germany, England, and Italy. Topics considered will include family life, rural unrest, criminal law reform, the poor, and the Enlightenment from Voltaire to Rousseau. (Satisfies the minor in the Humanities Program.) Staff (E) †

**108. The French Revolution: 1789-1814 (4)**

A lecture and discussion course dealing with the Revolution in France and its impact throughout Europe. Among the topics considered will be the origins of the Revolution, the birth of popular radicalism, the nature of the Terror and Robespierre and the impact of the Napoleonic Wars on England, Germany, and Italy. (E) †

**109. Hebrew Prophetic Literature (4)**

(Same as Lit/Gen 110 and Lit/Hebrew 110.) The prophetic books of the Bible in their historical contexts. The relationship between the prophetic and narrative books. Literary-critical analysis, theological issues, reference to archaeological data. D. N. Freedman (NW) †

**110A. Russia: Ninth Century to 1855 (4)**

The roots of Russian backwardness. The long-range historical impact of dominant personalities (Ivan the Terrible, Peter the Great, Catherine the Great) will be assessed. Edelman (E) †

**110B. Russia: 1855 to the Present (4)**

The long-term causes of the Revolution and its ultimate consequences. Course will consider the roles of Herzen, Lenin, Stalin, and Nicholas and Alexandra. 110A is not a prerequisite for 110B. Edelman (E)

**110Q. Special Topics in Modern Russian History (4)**

See *Colloquia* below.

**112A. European Economy and Society: 1450-1650**

Underlying structures of rural economy and society, geography, population, resources, technology. Evolution of commercial cities, unification of the European market systems, mercantilism, emergence of bureaucracies. Economic and social background of the industrial revolution. Ringrose

**112B. The Industrialization of Europe: 1750-Present (4)**

The beginning of industrialization in England and its spread through nineteenth-century Europe. World War I and the redefinition of economy: private enterprise vs. social justice, big business vs. state planning, and environmental limitations on "progress." Ringrose (E) †

**112Q. Special Topics in European Economic History (4)**

See *Colloquia* below.

**113. European Diplomatic History, 1870-1945 (4)**

The creation of the alliance system and the practice of European diplomacy at its zenith. The limitations of the diplomacy and the outbreak of the First World War. Efforts at peace and peacemaking, 1917-1919. The unresolved German question and the breakdown of the postwar settlement. The advent of Hitler and the disarray of the Western democracies. The Second World War: reversals of alliances and emergence of the superpowers. J. M. Hughes (E)

**113Q. War in the Twentieth Century (4)**

See *Colloquia* below.

**114. European Intellectual History, 1795-1890 (4)**

(Same as Humanities 114.) Focus on social thought in the central decades 1830-70, primarily in France and Germany, with more peripheral attention to Great Britain and Italy. Readings in Saint-Simon, Hegel, Tocqueville, Mill, Marx, Darwin, and Nietzsche. (Satisfies the Humanities Program minor.) H. S. Hughes (E)

**115Q. Lord and Peasant in East Europe (4)**

See *Colloquia* below.

**116. Lord and Peasant — East and West: Agrarian Revolution (4)**

A comparative treatment of the transformation from a feudal to capitalist base of the rural life and economy of East and West Europe. Edelman (E)

**116Q. Special Topics in the Social History of Early Modern Europe (4)**

See *Colloquia* below.

**118. German Politics and Culture: 1648-1848 (4)**

A lecture-discussion course on the political and cultural history of Germany in the early Modern Period. Luft (E) †

**118Q. German Thought in the Romantic Era: 1780-1830 (4)**

See *Colloquia* below.

**119. European Intellectual History, 1890-1933 (4)**

(Same as Humanities 119.) A lecture-discussion course on the crisis of bourgeois culture, the redefinition of Marxist ideology, and the transformation of modern social theory. Readings will include Nietzsche, Sorel, Weber, Freud, and Musil. (This course satisfies the minor in the Humanities Program.) Luft (E)

**119Q. Special Topics in Modern German Thought (4)**

See *Colloquia* below.

**120. Modern French History (4)**

A lecture-discussion course on the political and social history of France during the nineteenth and twentieth centuries. Mitchell (E)

**120Q. Nineteenth-Century Europe (4)**

See *Colloquia* below.

**121. Modern German History (4)**

A lecture-discussion course on the political and social history of Germany during the nineteenth and twentieth centuries. Mitchell (E)

**121Q. Twentieth-Century Europe (4)**

See *Colloquia* below.

**122. Modern British History (4)**

Emphasis on changes in social structure and corresponding shifts in political power. The expansion and the end of empire. Two World Wars and the erosion of economic leadership. J. M. Hughes (E)

**122Q. Ideology and the Imagination in Modern Britain (4)**

See *Colloquia* below.

**123. Power in American Society (4)**

(Same as Poli. Sci. 110J and Sociology 147.) This course examines the ways in which power has been conceived and contested by elites and non-elites during the course of American history. Through the writings, speeches and biographies of contestants in these struggles, the course explores the changes which have occurred in political rhetoric and strategies as America has moved from a relatively isolated agrarian and commercial republic to a military and industrial empire. Topics will include: the struggle over the Constitution, antebellum reform, agrarian and labor radicalism after the Civil War, the rise of socialist and communist parties after World War I, and the multi-faceted protest movements of the 60s and 70s. The course ends by considering the present in light of its continuities and discontinuities with the above traditions. Hahn, Nathanson, Strong (W)

**124. Social and Cultural History of Europe Since 1945 (4)**

Europe in the post-European world. The failure of the wartime Resistance. The restoration of bourgeois society. Economic boom and slump. The new role of meritocracy, labor unions, and public enterprise. Population shifts and the problems of women and foreign workers. Neorealism, existentialism, and the German cultural revival. Thaw and refreeze in Eastern Europe. The European economic community, the peace movement. H. S. Hughes (E)

**125. Italy Since 1860 (4)**

Political and social history since the unification treated primarily in terms of the successive attempts of parliamentary monarchy, fascism, Christian democracy, and communism to cope with such basic issues as church-state relations, the problem of the South, and the cleavages within Italian society. H. S. Hughes (E)

**126. Vienna 1900: Sex, Psyche, and Politics (4)**

This lecture-discussion course on Austrian history emphasizes the crisis of liberal culture in the late nineteenth and early twentieth centuries: the context for Freud and Hitler. Luft (E)

**126Q. Ideology and the Imagination in France, 1880-1955 (4)**

See *Colloquia* below.

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### 127. European Jewry: 1760-1960 (4)

A lecture course emphasizing the economic, scientific, and cultural role of the Jews, the internal history of their community, relations with the Christian majority, anti-Semitism, the Holocaust, and the post-1945 situation in Russia and Eastern Europe. Staff

### 128A-B. The History of Women in Europe (4-4)

A lecture-discussion course focusing upon the history of women in Europe from the beginning of the Middle Ages to the present. 128A deals with changes in women's roles, status, and sexual taboos from the beginning of the Middle Ages to 1789. 128B covers the history of women from the Industrial Revolution to the present, focusing on the role of women in radical political movements, the evolution of women's work and feminism. History 128A is not a prerequisite to 128B. Staff (E)†

### 129. The Origins of the Common Law (4)

Course begins with a discussion of the revival of jurisprudence in the twelfth century and then focuses on three areas of the early common law. First, we will cover the court system and its procedure. Second, we will study proprietary and possessory actions in property law. Third, we will discuss the origins of modern contract law. Chodorow (E)†

### 130A-B. The Expansion of Europe (4-4)

The techniques, economic organization, and institutional evolution of European colonizations in Africa, the Far East, and the Americas. The great geographical discoveries and the beginnings of world trade, with emphasis on comparative aspects. Ritchie, Marino (E)†

### 131A-B. British Empire Since 1783 (4-4)

The political and economic development of the British empire, including the evolution of colonial nationalism, the development of the commonwealth idea, and changes in British colonial policy. Galbraith (E)

### 132A-B-C. The Rise of Christianity (4-4-4)

(Same as Humanities 132A-B-C.) A study of the origins and development of Christian thought, history, literature, and institutions during the formative period from the birth of Jesus to the Middle Ages. The first quarter is devoted to the background in post-Biblical Judaism and pagan religions during the early Roman Empire. The second quarter focuses on New Testament literature, the early Fathers, and the history of the church in the Ante-Nicene period (A.D. 325). The third concentrates on the impact of Christianity on Western Europe during the Middle Ages and the fusion of Christian and pagan cultures in the Latin, Germanic, and Celtic traditions. (Satisfies the minor in the Humanities Program.) Mosshammer, Chodorow, Fitzgerald (E)†

### 132Q. St. Paul and the Apostolic Church (4)

See *Colloquia* below.

### 134. History of Australasia (4)

The history of Australia and New Zealand from the European settlement, with emphasis on the interrelationships between the settlers and aborigines; comparisons and contrasts between the Australian and New Zealand experiences. Galbraith

### 134Q. Spain in the Eighteenth Century (4)

See *Colloquia* below.

### 135A. Imperial Spain 1476-1808 (4)

The rise and decline of Spain's European empire from Ferdinand and Isabella to 1700. The revival of Spain and her return to European affairs in the eighteenth century. Ringrose (E)†

### 135B. Spain since 1808 (4)

Social, political, cultural history of Spain since Napoleon. Features second Spanish Republic, the Civil War, Franco era and transition to democracy. Staff (E)

### 137. The Bible and the Ancient Near East (4)

The course deals with the Bible in terms of its relationship to the history of ancient Israel and the Near East. It focuses on the biblical prophets, their historicity, their message, and the influence of the events of their day on the prophecy. *Prerequisite: Revelle Humanities 1, History 100, Cultural Traditions 1A, or any other courses in Bible.* Freedman

### 138Q. British Empire History (4)

See *Colloquia* below.

### 139. History of Canada (4)

A survey of the growth of Canada into a modern state from its beginnings under the French and British colonial empires. Galbraith (W)

### 139Q. Stereotypes of Imperial Britain (4)

See *Colloquia* below.

### 140A. Colonial Latin America: Era of Conquest (4)

The history of Latin America from 1400 to 1600. Lectures, reading, and discussion with emphasis on the history of Spain and Portugal, the great pre-Columbian civilizations of the New World (Inca, Aztec, Maya), and the age of exploration and conquest. Van Young (W)†

### 140B. Colonial Latin America: The Mature Colonies (4)

The history of Latin America (including Brazil) from 1600 to 1825. Lectures, reading, and discussion, with topics including slavery, social life, the evolution of political institutions, imperial rivalries, and the nature of the independence movements at the beginning of the nineteenth century. Van Young (W)†

### 140C. Latin America in the Twentieth Century (4)

This course surveys the history of the region by focusing on two interrelated phenomena: the absence of democracy in most nations and the region's economic dependence on more advanced countries, especially the United States. Among the topics discussed will be the Mexican Revolution, the military in politics, labor movements, the wars in Central America, liberation theology, and the current debt crisis. (W)

### 140Q. Topics in Latin American Colonial History, 1500-1820 (4)

See *Colloquia* listed below.

### 141. Social History of Colonial Latin America (4)

The course will examine the evolution of multiracial societies in Brazil and Spanish America, with some attention to the Anglo-American colonies by way of comparison. Particular emphasis on the relationship of race to class, and on topics such as race mixture, agrarian structures, slavery, urban life, and crime and social protest. Van Young (W)†

### 141Q. Indians and Whites in Latin America (4)

See *Colloquia* below.

### 143A. History of Argentina (4)

A survey from the colonial period to the present, with an emphasis on the nineteenth and twentieth centuries. Among the topics covered: the expansion of the frontier, the creation of a cosmopolitan, predominately European culture, and the failure of industrialization to provide an economic basis for democracy. Monteon

### 143B. History of Brazil (4)

From colonial times to the present with an emphasis on the nineteenth and twentieth centuries. Among the topics covered: the evolution of a slave-based economy, the key differences among regions, the military in politics, and the creation of the most populous and industrialized country in Latin America. Monteon

### 143G. History of Women in Latin America (4)

This seminar, designed for the nonspecialist, provides a broad historical overview of Hispanic-American women's history. The course will focus on issues of gender, sexuality and the family as they relate to women, as well as the main historiographical and methodological issues in Latin American women's history. While the main emphasis of the course is Latin America, some attention will be given to Mexican-American and Chicana women in the United States. Gutierrez

### 143Q. Special Topics in Latin American History (4)

See *Colloquia* below.

### 144. Mexico in the Sixteenth Century: Conquest and Compromise (4)

A close look at the dramatic history of Mexico from 1500 to 1600, a crucial period in the forging of a new society. Emphasis will be on the nature of late Aztec society, the cultural heritage of Spain, and the roles of religion, technology, the state, race mixture, and native resistance to the imposition of colonial rule. Van Young (W)†

### 144Q. The Political Economy of Argentina (4)

See *Colloquia* below.

### 145Q. Machismo and Matriarchy: The Latin American Social Structure (4)

See *Colloquia* below.

### 146A. History of Mexico (4)

A century of Mexican history, 1821-1924: the quest for political unity and economic solvency, the forging of a nationality, and the Gilded Age and aftermath, the ambivalent Revolution of Zapata and his enemies. Ruiz (W)

### 146B. History of Mexico (4)

Contemporary Mexico: the paradox of a conservative state as heir to a legendary social upheaval, with special emphasis on the mural art renaissance, the school crusade, the economic dilemma and the failure to eradicate poverty and inequality. Lectures and discussion. Ruiz (W)

### 146Q. Topics in Latin American History, 1820-1910 (4)

See *Colloquia* below.

### 147. Cuba: From Colony to Socialist Republic (4)

A lecture-discussion course on the historical roots of revolutionary Cuba, with special emphasis on the impact of the United States on the island's development and society. Ruiz

### 147Q. Cuba: From Colony to Socialist Republic (4)

See *Colloquia* below.

### 148A. Progress and Poverty in South America: 1820-1930 (4)

An examination of three phenomena on the continent: the expansion of centralized states, the boom-bust cycles of economic growth, and the persistence of mass misery. The first quarter covers the "export" phase of development, 1820-1930. *Prerequisite: none, although an introductory sequence in history, political science, or economics is useful.* Monteon

### 148B. Progress and Poverty in South America: 1930-Present (4)

An examination of three phenomena on the continent: the expansion of centralized states, the boom-bust cycles of economic growth, and the persistence of mass misery. The second quarter covers industrialization and its consequences, 1930-present. *Prerequisite: none, although an introductory sequence in history, political science, or economics is useful.* Monteon

### 149. Lord and Peasant in Latin America (4)

Examination of the historical roots of population problems, social conflict, and revolution in Latin America, with emphasis on man/land relationships. Special emphasis on modern reform efforts and on Mexico, Cuba, Brazil, and Argentina. Lecture, discussion, reading, and films. Van Young (W)

### 150. Anglo-American Rural Life: 1450-1750 (4)

This course will deal with the changing structure of English rural life as it responded to the growth of capitalism and to the problems of the New World. Ritchie (W)†

### 151A-B. U.S. Cultural History, 1607-1865 (4-4)

Transitions and transformations in American thought and values considered in social context. Topics include Puritan thought, republicanism, religious perfectionism, antebellum reform, sexual attitudes, transformations in art and architecture, Afro-American culture, and the slaveholders challenge to bourgeois culture. Readings include history and literature. Klein (W)†

### 152Q. The Rise of Capitalism (4)

See *Colloquia* below.

### 153. The South from Slavery to Freedom (4)

This course focuses on the American South during the nineteenth century as it made the transition from slavery to new forms of social organization. We will consider the social, economic, cultural, and political aspects of this transition. Topics include: the plantation system, race relations, Afro-American cultural life, slave resistance, planters and yeomen, the coming and meaning of the Civil War, Reconstruction, postwar labor relations, and the rise of agrarian radicalism. Hahn (W)

### 153Q. Topics in Southern History (4)

See *Colloquia* below.

### 154A-B. Legal and Constitutional History of the U.S. (4-4)

A lecture-discussion course on the development of American legal institutions and ideas from the colonial period to the present, with special emphasis upon the relationships between law and public policy. The first quarter focuses upon

theory and origins of federalism, the foundations of judicial review, and the transformation of the common law with respect to property, torts, and contracts. The second term explores the rise of the administrative-welfare state, the crisis of civil liberties in the twentieth century, and the problem of judicial review in a democratic society. Parrish (W)

**155A. Social and Economic History of the Southwest (4)**  
(Same as Chicano Studies 155A.) An introduction to American borderland history with special emphasis on economic and social development of the border states during the eighteenth and nineteenth centuries. The course is designed to present various interpretations of American Southwestern history. Gutierrez (W)

**155B. Social and Economic History of the Southwest (4)**  
(Same as Chicano Studies 155B.) The course will consider the significant trends in Mexican-American history over the past 100 years in the Southwest. Special emphasis will be placed on the primary documents relating to Mexican-Americans in economic and social institutions. Gutierrez (W)

**155Q. Mexican-American History (4)**  
See *Colloquia* below.

**156. Work and the Working Class in America (4)**  
This course examines the historical transformation of work in the United States and the accompanying growth and development of the American working class. Labor protest and ideology, the rise of trade unions, and labor today will be explored. Dublin (W)

**157. The Trials of America (4)**  
An in-depth look at the famous civil and criminal trials that have shaped the legal and constitutional history of the United States since the colonial period. The relationship between the American legal system and social change will be explored through a study of cases such as those involving John Peter Zenger, *Marbury v. Madison*, Dred Scott, Eugene Debs, the Scottsboro Boys, Alger Hiss, and *Richard Nixon v. United States*. Parrish (W)

**157Q. American Legal and Constitutional History (4)**  
See *Colloquia* below.

**158A-B. Economic History of the United States (4-4)**  
A two-quarter course exploring the development of the American economy from the colonial period to the present. Emphasis will be on the social and political dimensions of economic change: class structure and relations, standards of living, the process and impact of industrialization, regional and national economies, the labor market and the role of the state. The first quarter will consider the transformation of America from a preindustrial to an industrial society. The second quarter will examine the makings of the current economic crisis. Bernstein (W)

**159A. Afro-American History (4)**  
A lecture-discussion course which traces the development of Afro-Americans from the seventeenth century to the end of Reconstruction. Particular emphasis is placed upon African origins, the beginning of slavery in the New World, the development of slave communities, and the consequences of Civil War and Reconstruction. Saville (W)

**159B. Afro-American History (4)**  
A lecture-discussion course which examines the history of Afro-Americans from the Reconstruction period to the present, with special emphasis upon the legacy of slavery, the imposition of segregation, the development of civil rights movements from World War I to the present. Saville (W)

**159Q. Afro-American History (4)**  
See *Colloquia* below.

**160. United States: Colonial Period to 1763 (4)**  
Political and social history of the thirteen colonies; European background, settlement and expansion, beginnings of culture, and the imperial context. Staff (W) †

**160Q. Colonial American History (4)**  
See *Colloquia* below.

**161. United States: The American Revolution 1763-1800 (4)**  
Causes and consequences of the revolution: intellectual and social change, the problems of the new nation, the Constitution, the origins of political parties. Staff (W) †

**161Q. The American Revolution (4)**  
See *Colloquia* below.

**162Q. Topics in the History of American Radicalism (4)**  
See *Colloquia* below.

**163A-B. History and Social Role of Women in the United States (4-4)**  
A two-quarter course examining the history of women in the U.S. as members of different ethnic, racial, and socioeconomic groups from preindustrial times to the present. Emphasis is on the interrelationships between women's economic, social, and family roles. Dublin (W)

**163Q. Selected Topics in American Women's History (4)**  
See *Colloquia* below.

**164Q. American Slavery in Comparative Perspective (4)**  
See *Colloquia* below.

**165. The Social History of American Art and Architecture (4)**  
This course will explore the relationship between the evolution of American society and culture and the development of painting, sculpture, and architecture. Staff

**165Q. The Age of Emancipation (4)**  
See *Colloquia* below.

**166Q. American Society in the Cold War (4)**  
See *Colloquia* below.

**167A-B. The United States in the Twentieth Century (4-4)**  
General historiographical examination through lectures and discussion of political, social, economic, and international trends. Particular emphasis on increasing presidential power, political parties, voting trends, urbanization, and the creation of the welfare state, America's role in international politics, and the origins of the cold war, and the historical background of the social unrest of the 1960s. Parrish (W)

**167Q. Twentieth-Century American History (4)**  
See *Colloquia* below.

**168Q. America in the 1930s (4)**  
See *Colloquia* below.

**169A-B. History of American Foreign Policy and Diplomacy (4-4)**  
A two-quarter course in the history of American foreign policy and diplomacy covering the period from the establishment of the colonies to the present. The course deals with the policy of the United States and the forces — intellectual, economic, cultural, and social — which shaped that policy. Staff (W)

**170C. Medieval Muslim Commercial and Cultural Relations with the Pacific Rim (4)**

This course is designed to acquaint students with the commercial and cultural relations of medieval Muslim merchants, sailors and travellers with Malays, Sumatrans, Javanese, Cambodians, Chinese, and other peoples of the Pacific rim. The course will attempt to study the nature and significance of these relations, which up to that time were the most extensive with that part of the world. The course will cover such topics as: articles of commerce exchanged, trade routes and ports of call, identity of the merchants engaged in this trade, the hazards to which sailors and travellers of both sides were exposed. Finally, the course will seek to demonstrate that medieval Muslim enterprise in the Pacific rim was destined to lead in early modern times to even more intensive activities by various Western nations. Jwaideh

**171. Early Soviet Social History (4)**  
This course will stress the class struggle and the construction of socialism in Russia between the Revolution and World War II. The fate of the peasants and workers will be stressed. Other topics covered will be revolutionary culture, women's liberation, the national question, and the social basis of bureaucracy. Edelman (E)

**171Q. Quantitative Methodology in History (4)**  
See *Colloquia* below.

**172. The Era of Civil War and Reconstruction (4)**  
This course is chiefly a social and political history of the United States between 1848 and 1877. It explores the developing sectional conflict, disunion and civil war, and the process of reconstructing the nation; and it places the American experience in an international and comparative context. *Prerequisite: upper-division standing or consent of instructor* Hahn

**172Q. The Philosophy of History (4)**  
See *Colloquia* below.

**173A. History of Arms Control Negotiations (4)**  
(Same as Poli. Sci. 163AA and STPA163A.) A lecture-discussion course dealing with the history and process of international arms control negotiations in the nuclear age. Focus will be on the evolution of U.S. and Soviet nuclear weapons policies and efforts to control the superpower arms race. Topics will include the strategic balance, history of strategic concepts, weapons technology, and the legacy of pre-World War II arms diplomacy, nuclear test ban negotiations, and SALT/START. Students having taken Poli. Sci. 162AB or STPA 105B will not be allowed to take this course for credit. Greb (W)

**173B. START Simulation (4)**  
(Same as Poli. Sci. 163AB and STPA 163B.) A ten-week simulation of the U.S.-Soviet Strategic Arms Reduction Talks (START). Students will assume the roles of U.S. and Soviet governmental actors and will attempt to negotiate a START agreement. *Prerequisite: Poli. Sci. 162AB, STPA 105B, 163A, or History 173A.* Greb (W)

**173Q. Psychoanalysis and the Study of Society (4)**  
See *Colloquia* below.

**174. Topics in Jewish History (4)**  
This course studies a period or theme in Jewish history. Staff

**175A. History of Africa to 1880 (4)**  
(Same as Third World Studies 175A.) A survey of precolonial Africa, concentrating on ancient Africa, the role of Islam in African history, the medieval status of West Africa, East Africa in medieval times, the Forest Kingdoms of West Africa, state formation in East and Central Africa, the slave trade and abolition, and European penetration of the interior. Reynolds. (NW) †

**175B. Modern Africa (4)**  
(Same as Third World Studies 175B.) A survey of African history dealing with the European scramble for territory, primary resistance movements, the rise of nationalism and the response of metropolitan powers, the transfer of power, self-rule and military coups, the quest for identity and unity. Reynolds (NW)

**175Q. Marxist Method and Historical Analysis (4)**  
See *Colloquia* below.

**176. History of South Africa (4)**  
(Same as Third World Studies 176.) The origins and the interaction between the peoples of South Africa. Special attention will be devoted to industrial development, urbanization, African and Afrikaner nationalism, and the origin and development of apartheid and its consequences. Reynolds and Galbraith (NW)

**177. African Society and the Slave Trade (4)**  
Topics include African society on the eve of the slave trade, trans-Saharan trade, slavery with African societies, Atlantic slave trade, East African slave trade, problems of numbers exported and profitability, impact of slave trade on African society, and the abolition of the slave trade. Reynolds (NW)

**177Q. Economic History of Africa (4)**  
See *Colloquia* below.

**178. Economic History of Africa (4)**  
(Same as Third World Studies 178.) Lecture-discussion course on the economic development of sub-Saharan Africa from earliest times to the present. Topics will include: pre-European trade, the Atlantic slave trade, the era of legitimate trade, economic imperialism and the colonial economy, and post-independence economic development. Reynolds (NW) †

**178Q. Special Topics in African History (4)**  
See *Colloquia* below.

**180A. Ancient Japan and the Courtly Society (4)**  
From earliest times through the twelfth century. Subjects covered include the origins of the Japanese, ancient myth cycles and religious beliefs; the introduction of Buddhism and Chinese thought; and the brilliant "world of the shining prince." *Prerequisite: upper-division standing or consent of instructor.* Dower



## HISTORY

### 180B. Japan in the Age of the Samurai (4)

Covers from the twelfth to mid-nineteenth centuries. Topics include the rise and fall of the warrior class; the nature of feudal institutions; and value systems ranging from popular religion to Zen and the "way of the warrior." *Prerequisite: upper-division standing or consent of instructor.* Dower

### 180C. Japan's Emergence as a Modern State (4)

Covers Japan's tumultuous "modern century," from the opening to the West and overthrow of the feudal regime in the mid-1800s, through rapid Westernization and industrialization, culminating in aggression abroad and defeat in World War II. *Prerequisite: upper-division standing or consent of instructor.* Dower

### 180D. Pearl Harbor and Hiroshima: World War II in Asia (4)

Addresses the conflict in Asia from 1931 to 1945 with particular attention to the global order; the war in Japanese eyes; ideological and racial aspects of the conflict, and the legacies of the war to postwar Japan and Asia. Dower

### 180E. Occupied Japan and the Cold War in Asia (4)

Focuses on the dramatic allied (largely U.S.) occupation of Japan from 1945 to 1952, with attention to both "reform and reconstruction" within Japan and the emergence of Japan as America's leading cold-war ally in Asia. Dower

### 180Q. Colloquium on Modern Japanese History (4)

See *Colloquia* below.

### 181A. The History of Chinese Thought and Society: The Ancient Imperial Period (4)

This course deals with the genesis of Chinese thought and institutions in Shang and Chou times as well as Han political structure and thought. Metzger (NW) †

### 181B. The History of Chinese Thought and Society: The Middle Imperial Period (4)

This course deals with the decline of the Han empire, the rise of Buddhism, the transformation of Chinese society in T'ang and Sung times, and the beginnings of neo-Confucianism. *Prerequisite: 181A or consent of the instructor.* Metzger (NW) †

### 181C. The History of Chinese Thought and Society: The Late Imperial Period (4)

This course deals with the economic, political, and intellectual development of China during the five hundred years before the impact of the West. *Prerequisite: 181A or 181B, or consent of the instructor.* Metzger (NW) †

### 182. History of the Modern Chinese Revolution: 1800-1911 (4)

This course stresses the major social, political, and intellectual problems of China in the period from the Opium War to the Revolution of 1911. Special emphasis is placed on the nature of traditional Chinese society and values, the impact of Western imperialism and popular rebellion on the traditional order, reform movements, and the origins of the early revolutionary movement. Pickowicz (NW)

### 183. History of the Modern Chinese Revolution: 1911-1949 (4)

This course deals with the formative period of the twentieth-century Chinese revolution. Considerable stress is placed on the iconoclastic New Culture period, the rise of the student movement, Chinese communism, the labor movement, revolutionary nationalism, and the emergence of the peasant movement. Pickowicz (NW)

### 183Q. Cinema and Society in Twentieth-Century China (4)

See *Colloquia* below.

### 184. History of the People's Republic of China (4)

This course analyzes the history of the PRC from 1949 to the present. Special emphasis is placed on the problem of post-revolutionary institutionalization, the role of ideology, the tension between city and countryside, Maoism, the Great Leap Forward, the Cultural Revolution. Pickowicz (NW)

### 185Q. The Chinese Village in Transition, 1930-1956 (4)

See *Colloquia* below.

### 186Q. Self and Society in Modern Chinese Thought (4)

See *Colloquia* below.

### 187Q. Political Development and Thought in Taiwan Since 1945 (4)

See *Colloquia* below.

### 188Q. Chinese Thought from Chou through Sung (4)

See *Colloquia* below.

### 189Q. Literature and Society in Republican China (4)

See *Colloquia* below.

### 196A. History Honors (4)

A program of independent study providing candidates for history honors an opportunity to develop, in consultation with an adviser, a preliminary proposal for the honors essay. An IP grade will be awarded at the end of this quarter. A final grade will be given for both quarters at the end of 196B. Department stamp required. *Prerequisite: consent of instructor.* Staff

### 196B. The Honors Essay (4)

Independent study under the supervision of a faculty member leading to the preparation of an honors essay. A letter grade for both 196A and 196B will be given at the completion of this quarter. Department stamp required. *Prerequisite: consent of instructor.* Staff

### 196Q. Colloquium in History (4)

See *Colloquia* below.

### 197. Field Study (4)

Program to be arranged between student and instructor depending on student's needs and instructor's advice. Students are expected to produce substantial final papers on specific subjects described in student's proposals. To prepare such papers will require extensive research and writing. Will require bimonthly reports and one final paper. *Prerequisite: consent of instructor.* Staff

### 198. Directed Group Study (4)

Directed group study on a topic not generally included in the regular curriculum. Students must make arrangements with individual faculty members. (P/NP grades only.) *Prerequisite: consent of instructor.* Staff

### 199. Independent Study for Undergraduates (4)

Independent study on a topic not generally included in the regular curriculum. Students must make arrangements with individual faculty members. (P/NP grades only.) *Prerequisites: upper-division standing and consent of instructor.* Staff

## Colloquia

Colloquia are courses devoted to extensive study of special topics. These courses are limited to twenty or fewer students and are generally organized as seminars or discussion classes.

### 101Q. Alexander the Great and the Hellenistic World (4)

A study of the conquests of Alexander with special attention to the interpretation of the legends surrounding his career and to the transformation of culture in the world ruled by his successors. Mosshammer (E) †

### 102Q. The Decline of Rome (4)

This course offers an in-depth study of the later Roman Empire from the death of Marcus Aurelius (180) to the disintegration of the empire in the West. Attention is focused on the Germanic invasions, cultural differentiation between East and West, and the Christian transformation of the Roman world. Mosshammer (E) †

### 104Q. Special Topics in Medieval History (4)

Intensive study of special problems or periods in the history of medieval Europe. Topics vary from year to year, and students may therefore repeat the course for credit. Department stamp required. *Prerequisite: background in European history.* Chodorow (E) †

### 105Q. History of Early Modern Europe (4)

(Same as Humanities 105Q.) Topics will vary from year to year, and students may therefore repeat the course for credit with the permission of the instructor. (Satisfies the Humanities Program minor.) Marino (E) †

### 106Q. Instant History: The Rhetoric of Contemporary History (4)

(Same as Humanities 106Q.) This course examines the relationship between rhetoric and history. Four accounts of contemporary events which were witnessed by men intimately involved in the political and military affairs surrounding them offer an unusual insight into the act of historical composition.

Each work has a strong narrative thread, but it is their first-hand political acumen which transforms the record of events into compelling literature of the first rank. Thucydides, Guicciardini, and Trotsky each wrote to convince his audience that his was the "true history," but each also argued his case from partisan ideological perspectives. The role of objectivity, the meaning of propaganda, and the techniques of rhetoric are the object of our study into the power of persuasion. (Satisfies the Humanities Program minor.) Marino (E)

### 110Q. Special Topics in Modern Russian History (4)

Topics will vary from year to year. May be repeated for credit. Edelman (E)

### 112Q. Special Topics in European Economic History (4)

Analysis of the economic and social interactions between cities and their surrounding regions, comparing the impact of political, commercial, and industrial urbanization in the historical development of regions and countries. Each student will study one such city and present his or her findings to the seminar. Ringrose (E) †

### 113Q. War in the Twentieth Century (4)

Reckonings by novelists, essayists, and biographers with the phenomenon of contemporary warfare as an unprecedented experience and an abiding threat. Department stamp required. J. M. Hughes (E)

### 115Q. Lord and Peasant in East Europe

The transition from feudalism to capitalism in rural Prussia, Poland, and Russia.

### 116Q. Special Topics in the Social History of Early Modern Europe (4)

Topic varies from year to year. May be repeated for credit. Staff (E) †

### 118Q. German Thought in the Romantic Era: 1780-1830 (4)

(Same as Humanities 118Q.) Works of Kant, Schiller, Schelling, Schlegel, and Hegel will be read. (Satisfies the Humanities Program minor.) Department stamp required. Luft (E) †

### 119Q. Special Topics in Modern German Thought (4)

(Same as Humanities 119Q.) Topics will vary from year to year. (Satisfies the Humanities Program minor.) Department stamp required. *Prerequisite: background in European history.* Luft (E)

### 120Q. Nineteenth-Century Europe (4)

This course alternates with History 121Q. Topics will vary from year to year. Department stamp required. *Prerequisite: background in European history.* Mitchell (E)

### 121Q. Twentieth-Century Europe (4)

This course alternates with History 120Q. Topics will vary from year to year. May be repeated for credit. Department stamp required. *Prerequisite: background in European history.* Mitchell (E)

### 122Q. Ideology and the Imagination in Modern Britain (4)

Culture and society as reflected in novels and essays. Department stamp required. *Prerequisite: background in European history.* J. Hughes (E)

### 126Q. Ideology and the Imagination in France, 1880-1955 (4)

Three quarters of a century of social and cultural change as mirrored in writings by Zola, Durkheim, Martin du Gard, Bernanos, Gide, Sartre, and Levi-Strauss. Department stamp required. *Prerequisite: background in European history.* H. S. Hughes (E)

### 132Q. St. Paul and the Apostolic Church (4)

This course offers a detailed study of the formative period of Christianity during the first generation after the death of Jesus (ca. 35-80 A.D.) through careful analysis of the writing transmitted in the New Testament under the name of the Apostle Paul. Attention will be focused on the development of the New Testament Christology and on the question of whether or not Paul was the purveyor of a "New Gospel." Mosshammer (E) †

### 134Q. Spain in the Eighteenth Century (4)

Readings and discussion of recent studies on Spain in the eighteenth century: the attempt at national revival, social and economic conditions, Spain and the Enlightenment, and the breakup of the Old Regime after 1790. Department stamp required. *Prerequisite: background in European history.* Ringrose (E) †



**138Q. British Empire History (4)**

Special topics in British Empire history. Discussions on recent writings in Imperial history with particular reference to expansion in Africa. Galbraith

**139Q. Stereotypes of Imperial Britain (4)**

Stereotypes of Imperial Britain with regard to non-British peoples. Changing assessments of nineteenth-century imperial statesmen by biographers. Galbraith (W)

**140Q. Topics in Latin American Colonial History, 1500-1820 (4)**

Topics will deal with the social, economic, and political history of the Spanish and Portuguese experience in the new world and the presence of the black and the Indian. Department stamp required. *Prerequisite: background in Latin American history.* Staff (W) †

**141Q. Indians and Whites in Latin America (4)**

A close study of the relationship between race and class in Latin America, with some comparative discussion and reading on the U.S. Topics will include the pre-Columbian civilizations, mutual perceptions of Europeans and New World natives, peasantry and rural life, and the role of indigenous peoples in modern development. Van Young (W)†

**143Q. Special Topics in Latin American History (4)**

Topics will vary from year to year or quarter to quarter. May be repeated for an infinite number of times due to the nature of the content of the course always changing. To provide courses covering a larger area in the field of Latin America. Staff

**144Q. The Political Economy of Argentina (4)**

The course surveys the basic issues in Argentina's development since the late eighteenth century, focusing on the relation of politics to economics and of both to the dramatic economic stagnation of the last fifty years. Each student will be required to write a paper on one of these topics, based on his or her reading of scholarly monographs and journals. Department stamp required. Monteon (W)

**145Q. Machismo and Matriarchy: The Latin American Social Structure (4)**

The course will examine the social history of Latin America as the product of family structure and sexual mores. In addition to looking at the different settings in which the Latin American family evolved, the course will discuss the importance of miscegenation, the role of women, and the current social crisis of the region. Department stamp required. Gutierrez

**146Q. Topics in Latin American History, 1820-1910 (4)**

Topic will vary from year to year. May be repeated for credit. Ruiz (W)

**147Q. Cuba: From Colony to Socialist Republic (4)**

A colloquium on the historical roots of revolutionary Cuba, with special emphasis on the impact of the United States on the island's development and society. Ruiz (W)

**151Q. Nineteenth-Century United States History (4)**

Readings in selected topics in American history in the national period to 1877. Staff (W)

**152Q. The Rise of Capitalism (4)**

This colloquium will study the theoretical issues and debates associated with the rise of capitalism as a world system between the fourteenth and nineteenth centuries. Authorities considered will include Karl Marx, Max Weber, Maurice Dobb, Immanuel Wallerstein, Eric Hobsbawm, Perry Anderson, Robert Brenner, Eugene Genovese, and Andre Gunder Frank. The colloquium is open to graduate students and advanced undergraduates with the permission of instructor. *Prerequisites: upper-division standing and consent of instructor.* Hahn

**153Q. Topics in Southern History (4)**

Specific topics will vary: slavery, Civil War and Reconstruction, the Afro-American experience, race relations, etc. Hahn (W)

**155Q. Mexican-American History (4)**

This course will examine the historical literature concerned with the Mexican-American people in the United States. Specific topics of discussion will include immigration, urbanization, and assimilation of this population from the mid-nineteenth century to the present. Gutierrez (W)

**157Q. American Legal and Constitutional History (4)**

Readings for advanced students in the history of American law. Parrish (W)

**159Q. Afro-American History (4)**

Readings for advanced students in the history of the Afro-American in American society. (W)

**160Q. Colonial American History (4)**

This colloquium will consider late colonial history, with special attention to neglected or undigested topics including: the Great Awakening as a social movement unrelated to the American Revolution; developing markets, social communication and mobility and their impact on community integration and conflict; corporation-exclusivity, regulation and professionalization in the occupations; the origins of the American nationality; socioeconomic character of the early American. Department stamp required. *Prerequisite: background in American history.* Ritchie (W) †

**161Q. The American Revolution (4)**

Colloquium dealing with special topics on the American Revolution and the formation of the United States, 1763-1800. †

**162Q. Topics in the History of American Radicalism (4)**

This course will explore America's radical tradition by focusing on sources of continuity and change among radical movements. Topics will include: the Revolution, Abolitionism, labor radicalism, the women's movement, Populism, the New Left, the counter-culture. Klein (W)

**163Q. Selected Topics in American Women's History (4)**

The specific content of the course will vary from year to year but will always analyze in depth a limited number of issues in American women's history. Preference in enrollment will be given to students who have already taken History 163A or B. Dublin (W)

**164Q. American Slavery in Comparative Perspective (4)**

Examination of principal historical writings treating the emergence, consolidation, and destruction of slavery in selected plantation societies of the American South and the Caribbean region. Colloquium course open to juniors/seniors only. *Prerequisite: department stamp or consent of instructor. Courses in Latin American or U.S. history before 1900 preferred but not required.* Saville

**165Q. The Age of Emancipation (4)**

The century between the 1770s and the 1880s is commonly known as the age of nationalism and industrial revolution. It was also the great age of emancipation. During this period slavery, serfdom, and other forms of servile relations collapsed in much of the Western world; millions of slaves and peasants were liberated. This course will examine, comparatively, the process of the impact of emancipation in Europe, Latin America, and the American South. Hahn (W)

**166Q. American Society in the Cold War (4)**

An inquiry into the social, political, economic and constitutional impact of the Cold War upon American society between 1945-1960. Department stamp required. Parrish (W)

**167Q. Twentieth-Century American History (4)**

Leading works on Progressivism, New Deal. Depression and American foreign policy will be considered and discussed. The emphasis will be on historiography. Department stamp required. Parrish (W)

**168Q. America in the 1930s (4)**

The impact of the Great Depression upon American society will be investigated in this reading and discussion course. In addition to using other types of historical materials, the course will consider literary works which explore aspects of social life during the decade. Department stamp required. *Prerequisite: background in American history.* Parrish (W)

**171Q. Quantitative Methodology in History (4)**

An introduction to the use of quantification in history which will acquaint the student with the potential applications of social science methods to historical studies and teach basic quantitative skills, the use of packaged computer programs and basic statistics. Department stamp required. *Prerequisites: completion of several upper-division history courses.* Dublin (W,E,NW)

**172Q. The Philosophy of History (4)**

Establishment of the distinction between analytic and speculative philosophy of history, with emphasis on the former. Examination of the concepts and terms ordinarily used in histor-

ical discourse, as exemplified in major works of interpretation from Vico to Marc Bloch. Department stamp required. *Prerequisites: completion of several upper-division history courses and background in European history.* H. S. Hughes (E)

**173Q. Psychoanalysis and the Study of Society (4)**

An exploration of the varying ways in which psychoanalytic theory has been applied in the social sciences. Department stamp required. J. M. Hughes (E)

**175Q. Marxist Method and Historical Analysis (4)**

This colloquium will attempt to synthesize theoretical and historical writings with a view toward understanding Marxist approaches to historical study. Readings include Marx and contemporary American and European historians. Department stamp required. Dublin (W,NW,E)

**177Q. The Economic History of Africa (4)**

Will examine selected topics in African economic history. Topics will include the precolonial economy, economics of colonialism, economics of underdevelopment and postcolonial economic development. Department stamp required. *Prerequisites: completion of several upper-division history courses.* Reynolds (NW)

**178Q. Special Topics in African History (4)**

This colloquium is intended for students with sufficient background in African history. Topics, which vary from year to year, will include traditional political, economic, and religious systems, and theory and practice of indirect rule, decolonization, African socialism and pan-Africanism. Department stamp required. Reynolds (NW)

**180Q. Colloquium on Modern Japanese History (4)**

This colloquium examines controversial, domestic, and international issues in Japanese history from 1850 to recent times. Topics will vary from year to year. Dower

**183Q. Cinema and Society in Twentieth-Century China (4)**

This colloquium will explore the relationship between cinema and society in twentieth-century China. The emphasis will be on the social, political, and cultural impact of film making. The specific period under examination (1930s, 1940s, post-1949) may vary with each quarter. *Knowledge of Chinese strongly recommended.* Department stamp required. Pickowicz (NW)

**185Q. Chinese Village in Transition: 1930-1956 (4)**

A research colloquium that examines social, economic, political, and cultural conditions in North China villages during Nationalist rule, World War II, the Civil War, and the early years of communist rule. Department stamp required. *Prerequisites: completion of several upper-division history courses.* Pickowicz (NW)

**186Q. Self and Society in Modern Chinese Thought (4)**

This course examines the confluence of traditional and modern ways of thought in China, dealing with revolutionary, liberal, and conservative trends in the twentieth century and with their relationships to traditional orientations. Department stamp required. *Prerequisite: Hist. 186 or consent of instructor.* Metzger (NW)

**187Q. Political Development and Thought in Taiwan Since 1945 (4)**

Three levels of discussion will be emphasized: first, the main economic events since 1945, along with some study of private and public economic institutions and of the central aspects of rural and urban life as described by social scientists; central political events, such as the various violent incidents and the development of elections; and the broad spectrum of political thought, ranging from the orthodox Kuomintang philosophy to the banned writings of dissenters. Department stamp required. *Prerequisites: one or more courses in Chinese history.* Metzger (NW)

**188Q. Chinese Thought from Chou through Sung (4)**

This course will deal with both literary and intellectual tendencies and will be designed around student interests in subjects such as Chou Confucianism, Maoism, Taoism, legalism, and eclecticism; the rise of imperial Confucianism; Buddhist thought; neo-Confucian thought; and Sung humanism. Metzger (NW)

**189Q. Literature and Society in Republican China (4)**

A colloquium that examines the relationship between literature and society in the 1911-1949 period. Novels, short stories,

## HISTORY

critical essays and feature-length films are used to document the social, political, and intellectual history of the Republican era. Department stamp required. Pickowicz (NW)

### 196Q. Colloquium in History (4)

The nature and uses of history are explored through the study of the historian's craft based on critical analysis of historical literature relating to selected topics of concern to all historians. Required of all candidates for history honors and open to other interested students with the instructor's permission. Department stamp required. Staff

## Graduate

Graduate standing is a prerequisite for all graduate-level courses.

### 201. The Literatures of Ancient History (4)

An introduction to the bibliography, methodology, and ancillary disciplines for the study of ancient history together with readings and discussion on selected topics in the field. Topics vary from year to year. Mosshammer

### 204A-B. Seminar in Medieval History (4-4)

Topics will include the Investiture Contest, concentrating on the personalities involved in the ideas on both sides of the dispute, and the study of the development of Canonical jurisprudence, 1140-1234. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. Chodorow

### 205. Latin Paleography (4)

Course trains graduate students in the reading and study of medieval Latin manuscripts. Topics covered include codicology, paleography and editing of texts. *Prerequisites:* Latin and either French or German, and consent of the instructor. Chodorow

### 208A-B-C. Central Problems in European History from 1500-1945 (4-4-4)

A three-quarter sequence of readings and discussions, taught by different members of the staff each quarter. Required for all beginning graduate students, including M.A. candidates in early modern and modern European history, as well as for students preparing a secondary field in either area. 208A covers the period from 1500-1715; 208B covers from 1715-1850; and 208C covers from 1850-1945.

### 210. Readings in Modern Russian History (4)

Students will read major works on Revolutionary Russia and Soviet history. Attention will be paid to both classic and revisionist works. Edelman

### 219. Knowledge and Meaning (4)

Readings in European intellectual history since the late nineteenth century. Previous work in intellectual history is required. May be repeated as course content changes. Luft

### 220A-B. Topics in Modern European History (4-4)

Varied topics in modern European history. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite:* 220A is a prerequisite for 220B.

### 222A. Major German Authors (4)

(Same as Lit/German 252.) A study in depth of the work of one major German author. May be repeated for credit as topics vary. Luft

### 229A-B. Seminar in British Empire History (4-4)

Topics on the history of the British Empire. May be repeated for credit.

### 230A. Department Colloquium (1-4)

A forum for the presentation of new research by students, faculty, and visiting scholars. The course will be offered quarterly under the direction of regular faculty members.

### 230B. Department Colloquium (1-4)

A forum for the presentation of new research by students, faculty, and visiting scholars. The course will be offered quarterly under the direction of regular faculty members.

### 230C. Department Colloquium (1-4)

A forum for the presentation of new research by students, faculty, and visiting scholars. The course will be offered quarterly under the direction of regular faculty members.

### 234. Spain Since 1750 (4)

Readings and critical analysis of selected topics and important works in the history of Spain since 1750. Graduate standing required. May be repeated as content changes. Proficiency in Spanish required to repeat course, but not for the first time taken.

### 236A-B. Seminar in Spain since 1870 (4)

Topics in the history of Spain since 1870. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

### 240A-B. Readings and Seminar on Colonial Latin America (4-4)

A two-quarter course involving readings and research on sixteenth- through eighteenth-century Latin America. Students are expected to compose a paper based on original research that is due in the second quarter. Reading knowledge of Spanish required. Van Young

### 241A-B. Readings and Seminar on South America, the National Period (4-4)

A two-quarter course involving readings and research; the first quarter is devoted to the nineteenth and the second quarter to the twentieth century. Students are expected to compose a paper based on original research that is due in the second quarter. Reading knowledge of Spanish and/or Portuguese is helpful but not required. Monteón

### 242A-B. Readings and Seminar on Mexico, Cuba, and Central America (4-4)

A two-quarter course involving readings and research. Students are expected to compose a paper based on original research that is due in the second quarter. Reading knowledge of Spanish required. Ruiz

### 244. Topics in Colonial Latin America (4)

One or two topics in colonial history will be analyzed in depth; reading knowledge of Spanish is expected. Van Young

### 245. Topics in the National Period of Latin America (4)

One or two topics in the national period or the national history of one country will be analyzed in depth; a reading knowledge of Spanish is expected. Monteón or Ruiz

### 246A-B. History of Mexico (4-4)

A research and study seminar of two quarters with primary emphasis on social change and the Mexican Revolution of 1910. The first quarter deals with primary sources, bibliography, and the selection of a research project; in the second quarter, the student will complete the project and submit the study to the scrutiny of the seminar. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite:* 246A is a prerequisite for 246B. Ruiz

### 247A-B-C. Seminar/Literature of Latin America (4-4-4)

Introduction to the literature of Latin American history. A three-quarter sequence of readings and discussions taught each quarter by members of the staff. Required for all beginning students for a graduate degree specializing in Latin American history; open and strongly recommended to other students using Latin American history as a secondary field for a graduate degree. History 247A covers the colonial period, from Conquest to Independence; History 247B covers South America from Independence to today; History 247C covers Mexico, Cuba, and Central America from Independence to today. The three quarters need not be taken in sequence. Reading knowledge of Spanish is required. Bonilla, Monteón, Ruiz, and Van Young.

### 250A-B-C. The Literature of American History (4-4-4)

A three-quarter sequence of readings and discussions on the bibliographical and monographic literature of American history from the colonial period to the present. Taught by different members of the staff each quarter, the course is required of all beginning graduate students in American history.

### 251. Readings in American History (4)

Readings and discussion in selected areas of American history for advanced graduate students. Taught each quarter by a different member of the staff.

### 252. Seminar in Southern History (4)

Analysis of major works on the history of the southern United States, focusing on social groups, class and race relations, economic development, culture, and politics. An intercampus course taught jointly by participating faculty from UCSD, UCI, and UCR.

### 254A-B. American Legal History (4-4)

A two-quarter research seminar for graduate students focusing upon the development of American legal institutions and ideas from the colonial period to the present, with special emphasis upon the relationship of law to public policy. Parrish

### 260A-B. War and Society (4-4)

A research seminar on the impact of war on societies. The first quarter will be devoted to readings and discussions and the second quarter to the writing of individual research papers. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

### 261A-B. United States, Colonial Period (4)

The United States in the colonial period. Ritchie

### 266A-B. United States History, 1789-1877 (4-4)

Analysis of sources and methods of historical research in the National Period to 1877. Readings and original research papers will be required.

### 268A-B. American Society in the Twentieth Century (4)

A two-quarter research seminar. Students will receive training in the archival sources and research techniques relevant to study of selected topics on American society since ca. 1900. Individual research papers. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

### 269A-B. Topics in U.S. Diplomatic History (4-4)

Critical analysis of major works in U.S. diplomatic history, designed to acquaint the student with the historiographic developments in the field. Readings, discussions, and papers will form the basis of the course. An IP grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter.

### 271A-B. Seminar on Quantitative Methodology in History (4)

A research seminar on quantitative methods in history. The first quarter will be devoted to instruction in elementary statistics and use of the computer and the second quarter to the writing of individual research papers. An IP grade will be awarded at the end of the first quarter and a final grade given only at the end of the second quarter. Dublin

### 277A-B. Seminar in West African History (4-4)

A two-quarter seminar on selected topics in West African history. One quarter will be devoted to readings and discussions, and the second quarter will be devoted to the writing of individual research papers. Reynolds

### 295. Thesis Seminar (4)

For students advanced to candidacy to the doctorate. Discussion, criticism, and revision of drafts of chapters of theses, and of work to be submitted for publication. Graduate standing with advancement to candidacy.

### 298. Directed Reading (1-12)

Guided and supervised reading in the literature of the several fields of history. (S/U grades permitted.)

### 299. Thesis Direction (1-12)

Independent work by graduate students engaged in research and writing of doctoral theses. (S/U grades only.)

### 500. Apprentice Teaching (1-4)

A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation and grading of examinations and other written exercises, and student relations. (S/U grades only.)

### 501. Teaching in the Humanities (1-4)

Consideration of pedagogical methods appropriate to the teaching of literary, historical, and philosophical texts at the undergraduate level. Pedagogical aids for the teaching of composition. Supervised teaching in sections of the undergraduate humanities sequence. The student must be a teaching assistant or fellow-teaching assistant in Revelle College. (S/U grades only.)

### 503. Teaching in Third World Studies (1-4)

A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation and grading of examinations and other written exercises, and student relations. (S/U grades only.)

## HUMANITIES

OFFICE: 1512 Humanities Undergraduate Library Building, Revelle College

The Humanities Program courses are offered jointly by the Departments of History, Literature, and Philosophy and are intended to provide an interdisciplinary introduction to major aspects of the Western humanistic tradition. Students learn to interpret important literary, historical, and philosophical documents through lectures and discussions as well as through the writing of themes.

The sequence of courses, Humanities 1 through 5, is designed to meet the humanities and writing requirement of Revelle College. (*Students must have satisfied the university's Subject A requirement before registering for this sequence.*)

In connection with learning about the Western tradition, students in Humanities 1 and 2 (six units each) will receive intensive instruction in university-level writing. Instruction in writing is provided in discussion sections, and frequent writing exercises are required.

Written work is also required in the remaining three quarters of the sequence (Humanities 3-4-5, four units each). Humanities 1 and 2 *must* be taken before Humanities 3-4-5.

### The Humanities Minor Program

The humanities minor consists of six courses chosen from the following listings. All of these six *may* be selected from the upper-division offerings, but at least three upper-division courses *must* be included. Students are advised to discuss specific plans for completing the minor with the humanities adviser as well as with the advisers in their college.

Normally, students interested in majoring in the humanities must choose a specific major within the humanities, i.e., history, literature, or philosophy. Students from Revelle and Muir Colleges may request to graduate with an approved individual/special project major in the humanities.

For detailed description of the Revelle College humanities requirement see "Revelle College, General-Education Requirements, Humanities."

## Courses

### Lower Division

#### 1. The Foundations of Western Civilization: Israel and Greece (6)

Study of the two cultures that together formed the foundation on which Western civilization is built. Study of the Hebrew Bible in the context of the ancient Near Eastern world; exami-

nation of texts from literary, historical, and theological perspectives. Study of the Hellenic world; examination of works of poetry, drama, philosophy, and history. This course offers intensive instruction in writing university-level expository prose. Three hours of lecture, two hours of writing and reading laboratory. *Prerequisite: Satisfaction of the Subject A requirement.* (W)

#### 2. Rome, Christianity, and the Medieval World (6)

This course explores the foundations of civilization in Western Europe by examining the three discrete strands of Roman, Christian, and Germanic culture. Humans, gods, and politics are our themes from the late classical world through the Middle Ages. The course offers intensive instruction in writing university-level expository prose. Three hours of lecture, two hours of writing and reading laboratory. *Prerequisite: Satisfaction of the Subject A requirement.* (S)

#### 3. Renaissance, Reformation, and Early Modern Europe (4)

This period recapitulates many of the classical and medieval concerns about the nature of the state and the state of nature. Three critical issues come to the fore at the beginning of the sixteenth century: rational political analysis follows the French invasions of Italy, examination of humanity's place in the world follows the discovery of America, and religious reform and renewal follow from church abuses and biblical scholarship. Humanism offers a new critical method to evaluate the validity of texts and tradition while it encourages committed ethical conduct. Three hours of lecture, one hour of discussion. *Prerequisite: Satisfaction of the Subject A Requirement.* (F)

#### 4. Enlightenment, Romanticism, Revolution, Reaction (1660-1848) (4)

Triumphs of empirical science in the seventeenth and eighteenth centuries prepared the way for the Enlightenment's far-reaching revisions of traditional views about ethics, religion, and the prospects for human happiness. Revolutions in England (1688), America (1776), and France (1789) combined with the rise of classical liberalism and romantic ideas of human nature to challenge traditional forms of social and political life. Three hours of lecture, one hour of discussion. *Prerequisite: Satisfaction of the Subject A requirement.* (W)

#### 5. The Crisis of European Culture (1848-present) (4)

This course emphasizes the crisis of European culture and the liberal tradition in the nineteenth and twentieth centuries. Readings stress the challenges from Marx, Nietzsche, and Freud and the political upheavals and conflicts since the First World War, particularly the Russian Revolution and the fascist era. Three hours of lecture, one hour of discussion. *Prerequisite: Satisfaction of the Subject A requirement.* (S)

## Upper Division

#### 104. The Bible and Western Literature (4)

(Same as Lit/Gen 104.) Biblical and related texts that influenced the great writers of the Middle Ages and Renaissance, including the selections from the Jewish and Christian scriptures.

#### 105Q. Special Topics in the History of Early Modern Europe (4)

(Same as History 105Q.) Topics will vary from year to year.

#### 106Q. Instant History: The Rhetoric of Contemporary History (4)

(Same as History 106Q.) This course examines the relationship between rhetoric and history. Four accounts of contemporary events which were witnessed by men intimately involved in the political and military affairs surrounding them offer an unusual insight into the act of historical composition. Each work has a strong narrative thread, but it is their first-hand political acumen which transforms the record of events into compelling literature of the first rank. Thucydides, Guicciardini, Bernal Diaz del Castillo, and Trotsky wrote to convince their audience that theirs was "true history," but each also argued his case from partisan ideological perspectives. The role of objectivity, the meaning of propaganda, and the techniques of rhetoric are the object of our study into the power of persuasion.

#### 107. Europe in the Eighteenth Century (4)

(Same as History 107.) A lecture and discussion course focusing upon Europe between 1680 and 1789. Emphasis is upon the social and intellectual history of France, Germany, England and Italy, and topics considered will include family life, rural unrest, criminal law reform, the poor, and the Enlightenment from Voltaire to Rousseau.

#### 110. Mythology (4)

(Same as Lit/Gen 119.) A study of various bodies of myth: their content, form, and meaning. May be taken for repeated credit as topics vary.

#### 114. European Intellectual History, 1795-1890 (4)

(Same as History 114.) Focus on social thought in the central decades 1830-70, primarily in France and Germany, with more peripheral attention to Great Britain and Italy. Readings in Saint-Simon, Hegel, Tocqueville, Mill, Marx, Darwin, and Nietzsche.

#### 118Q. German Thought in the Romantic Era: 1780-1830 (4)

(Same as History 118Q.) Works of Kant, Schiller, Schelling, Schlegel, and Hegel will be read.

#### 119. European Intellectual History, 1890-1933 (4)

(Same as History 119.) A lecture-discussion course on the crisis of bourgeois culture, the redefinition of Marxist ideology, and the transformation of modern social theory. Readings will include Nietzsche, Sorel, Weber, Freud, and Musil.

#### 119Q. Special Topics in Modern German Thought (4)

(Same as History 119Q.) Topics will vary from year to year.

#### 124. Studies in European Romanticism (4)

(Same as Lit/Gen 124.) Attention given to historical and cultural contexts. Topics to be considered include the concept of nature, the reaction to science, the role of the imagination. May be repeated for credit as topics vary.

#### 126. Epic Poetry (4)

(Same as Lit/Gen 126.) A study of major epics, in translation if their original language is not English. May be repeated for credit as topics vary.

#### 131Q. The Historical Novel (4)

(Same as History 131Q.) Works of Stendhal, Tolstoy, Thomas Mann, and Solzhenitsyn will be studied in their historical context. Among the questions to be treated: their factual accuracy, their choice of the novel as a form, their interpretations of history. Oral and written reports will be expected.

#### 132A-B-C. The Rise of Christianity (4-4-4)

(Same as History 132A-B-C.) A study of the origins and development of Christian thought, history, literature, and institutions during the formative period from the birth of Jesus to the Middle Ages. The first quarter is devoted to the background in post-biblical Judaism and pagan religions during the early Roman Empire. The second quarter focuses on New Testament literature, the early Fathers, and the history of the Church in the Ante-Nicene period (A.D. 325). The third concentrates on the impact of Christianity on Western Europe during the Middle Ages and the fusion of Christian and pagan culture in the Latin, Germanic, and Celtic traditions.

#### 134. Literature of Renaissance (4)

(Same as Lit/Gen 134.) A study of literary/humanistic texts from various cultures involved in the European Renaissance.

#### 145. Nihilism (4)

(Same as Philosophy 145.) A consideration of various claims about the end or collapse of the Western philosophical tradition, with particular emphasis on claims about the consequences of the absence of "ultimate" rational justification in morality, or even in science and philosophy. Readings will vary, but will most likely include works by Nietzsche, Dewey, Heidegger, Wittgenstein, Derrida, seminal texts in the history of moral and political thought, and selections from contemporary American philosophers concerned with the issue.

#### 150. Aesthetics (4)

(Same as Philosophy 150.) An examination of major concepts and issues in aesthetics, such as truth, expression and imagination, the nature of the aesthetic attitude and of critical evaluation.

#### 152. Philosophy and Literature (4)

(Same as Philosophy 152.) Philosophy and Literature: A study of philosophical themes as presented in selected fiction, drama, or poetry, as well as an inquiry into philosophical puzzles that arise in the appreciation and criticism of literature.

#### 162. Folk and Fairy Tales (4)

(Same as Lit/Gen 162.) A study of folk and fairy tales from various cultures, from the point of view of literary form, psychological meaning, and cultural function. May be taken for repeated credit as topics vary.

## INTERNATIONAL RELATIONS AND PACIFIC STUDIES GRADUATE SCHOOL

### 164. Philosophy of History (4)

(Same as Philosophy 164.) A study of classical and contemporary conceptions of history and historical knowledge.

## INTERNATIONAL RELATIONS AND PACIFIC STUDIES GRADUATE SCHOOL

OFFICE: Second Floor, Building 518,  
Matthews Administrative and  
Academic Complex

### Professors:

Peter Evans, Ph.D.  
Peter Gourevitch, Ph.D. (*Dean*)  
Miles Kahler, Ph.D.  
Lawrence Krause, Ph.D.  
R. John McMillan, Ph.D.

### Assistant Professors:

Tun-jen Cheng, A.B.D. (*Acting*)

### Adjunct:

Joseph Grunwald, Ph.D.  
(*Adjunct Professor of IR/PS and  
Economics*)

### Affiliate:

A large number of faculty in UCSD departments have agreed to assist in teaching IR/PS students.

## The Master's Degree in Pacific International Affairs (MPIA)

### Requirements for Admission

Students interested in pursuing a degree program at UCSD's Graduate School of International Relations and Pacific Studies (IR/PS) must have earned a B.A., or equivalent, with training comparable to that provided by the University of California. A minimum scholastic average of B or better is required for course work completed in upper-division or prior graduate study. Undergraduate preparation that includes one or more of the following will be helpful: the social sciences and history, computer and quantitative skills (such as calculus and statistics), and foreign language and related area studies courses. Experience that shows the student's ability to work effectively in an international environment will also be helpful.

Applicants should submit three letters of recommendation from individuals who can attest to their academic or professional competence and to their interest in pursuing graduate training in international affairs.

The GRE (Verbal, Quantitative, and Analytical) is required; GMAT and LSAT scores are not required, but may be submitted. A minimum score of 550 on the TOEFL is required of all international applicants whose native language is not English and whose undergraduate education was conducted in a language other than English.

Applicants wishing to improve their preparation are encouraged to strengthen their quantitative skills and their background in a Pacific region language. The school will not admit part-time students at this time.

### The Curriculum

The required curriculum consists of four parts:

- I. The Core Curriculum
- II. Career and Regional Specializations
- III. Professional Skills
- IV. Applications

### I. The Core Curriculum (twelve courses, forty-eight units)

- Economics (three courses)
- Comparative Policy Environments (three courses)
- Management (three courses)
- International Relations (two courses)
- Comparative Cultural Environments (one course)

The Core Curriculum integrates the study of management, economics, and politics of the Pacific region — East Asia, Southeast Asia, Australia, New Zealand, and Latin America. This strong common requirement of twelve courses (forty-eight units), which most students will take together during their first year, gives each class a shared educational experience.

### Economics (three courses):

(1) *Managerial Economics*: Microeconomics from the managerial perspective. Topics will include demand theory, cost and production theory, pricing in non-strategic markets, pricing in oligopolistic markets, uncertainty and insurance, regulation and market failure. (2) *Macroeconomy and Economic Policy*: Determinants of aggregate output, employment, and the price level. Analysis of long-term and short-term economic fluctuations. Theories and international comparisons of fiscal and monetary policy. Comparison of planned, mixed, and market economies. (3) *International Economics*: The theory and mechanics of international economics. Included will be such topics as real trade theory, international movements of capital, the international monetary system, the effects of

trade and capital flows on domestic economies, and policies toward trade and foreign investment.

### Comparative Policy Environments (three courses):

A three-course sequence designed to teach students how to "read" a country's political and economic system. The course will examine how the evolution of political institutions and processes in the countries of the Pacific region influence the way in which political choices are made. Historical and comparative readings will be combined with case studies of policy decisions (public and private), enabling students to analyze the key power relationships, interest group configurations, and organizational structures that shape policy outcomes. Finance, taxation, industrial and agricultural development, social welfare and labor relations will be among the policy areas considered. Examples: comparison of the management of foreign debt in Mexico and South Korea or the protection of domestic industry from foreign competition in China and Brazil.

### Management (three courses):

(1) *Accounting*: An introduction to financial accounting designed to prepare students to understand their own organizations' international operations and to interpret information from outside organizations. The course emphasizes understanding the potential uses and limitations of accounting information for management purposes. The procedural aspects of accounting will be introduced to illustrate the basic concepts. Issues in international accounting, such as foreign currency accounting, multinational transfer pricing and consolidations, and the control and evaluation of foreign operations will be covered. (2) *Finance*: This course surveys the financial problems facing managers and analyzes financial institutions, financial instruments, and capital markets. Special emphasis is placed on international financial topics such as exchange rate behavior, balance of payments adjustment, the management of international risk, and international financing. (3) *Strategy and Bargaining*: This course analyzes competitive interactions, surveying the modern economic analysis of relationships between and within organizations. The foundations of the course are game theory and the economics of information. Theoretical topics include bargaining and contracting, principal-agent models, and bidding models. Applications include industrial structure and corporate strategy,



the internal organization of the firm, government contracting, regulation, and international negotiations.

### **International Relations (two courses):**

(1) *International Politics*: The course examines the strategies employed by states to ensure their national security and the international consequences of and constraints on those strategies. Levels of analysis (system and nation-state) and organizing concepts of international politics are introduced. The evolution of past international systems and the contemporary system are analyzed, particularly the implications of bipolarity and multipolarity. The usefulness of power as an organizing principle is evaluated through the debates between exponents of realism and neo-realism, and their critics. Competing explanations for state behavior are considered. The instruments employed by states, such as the threat and use of force (coercive diplomacy and deterrence) are examined together with the circumstances of cooperation: alliances, international organization, and international law. The place of moral judgments and norms in the international spheres is the final topic. (2) *The Politics of International Economic Relations*: The course presents explanations for the political organization of the international economy, in particular arguments linking the distribution of international power to characteristics of the international political economy. Principal issue-areas and their organization are surveyed: money, macroeconomic policy coordination, trade, energy, foreign investment, and commodities. The determination of foreign economic policies and the use of economic instruments by states are examined. Explanations for international inequality, such as dependency theory, are evaluated.

### **Comparative Cultural Environments (one course):**

A course on the interpretation of similarities and differences in cultural forms that prepares students to understand and act in different cultural settings. Course materials will include biography, ethnography, film, history, and exemplars of popular culture from societies of the Pacific region. In addition, cross-cultural training instruments designed to help students effectively interact in international settings will be included.

## **II. Career and Regional Specializations (six courses, twenty-four units)**

Career Specialization (three courses)  
Regional Specialization (three courses)

The program will satisfy different intellectual interests and career goals by allowing each student to select a career specialization and a regional specialization. Students will take at least three courses (twelve units) in an area of specialization for career preparation. Each specialization could lead to a variety of careers in the private and public sectors. The specializations are as follows:

### **(1) International Management:**

This specialization includes intermediate and advanced courses in such areas as finance, accounting, and marketing similar to those offered in MBA programs, as well as courses focusing on international business activities such as multinational corporations, project analysis and planning, trade, and risk analysis.

### **(2) International Relations:**

This specialization includes courses on the political-military relations among states, as well as political dimensions of their economic relations. Attention is directed toward the Pacific region as an international subsystem.

### **(3) Comparative Public Policy:**

This specialization includes courses comparing industrial policies, development policies, and technology and natural resource policies of Pacific region countries. Students may also choose to concentrate in a particular industry such as energy or telecommunications.

The master's program requires students to acquire knowledge of one particular country or region in the Pacific. Students will take at least three courses (twelve units) on China, Japan, or Latin America. (Other regional specializations such as Southeast Asia, Korea, Australia, New Zealand, or Indonesia will be offered as the faculty of the school expands.) Students' choice of regional specialization must coincide with their choice of foreign language.

## **III. Professional Skills: Foreign Language (six courses, twelve units) and Quantitative Methods (three courses, six units)**

Foreign Language (achievement of intermediate level of competency through courses and a special two-unit per quarter maintenance program)

Quantitative Methods (three two-unit courses)

### **Foreign Language Competency Requirement:**

All students are expected to acquire the language skills necessary to work in the Pacific region. The foreign language competency requirement is designed to insure that students have achieved a level of familiarity with foreign language that provides a foundation for life-long improvement.

Because languages are not equally difficult to learn, the level of required competency varies among different languages. The minimum competency requirement for the master's degree is 2+ on the Foreign Service Institute Scales (FSI) for Spanish and 2- for Chinese and Japanese. Students may take the competency examination at any time and must pass it before receiving their degree.

Students may prepare for the competency examination in a variety of ways, depending on their language background when they enter the program: (1) those who enter at FSI level 1 (roughly equivalent to two years of Chinese or Japanese or one plus years of Spanish) will usually be able to achieve the requisite level in two years by a combination of intensive language study in the summer and the six language maintenance courses in the two-year program. (2) Those who enter at FSI level 2 (roughly equivalent to three years of Chinese or Japanese or two plus years of Spanish) should be able to achieve the requisite level in two years without any intensive language training during the first summer. (3) Those who enter with no previous training in these foreign languages will need to spend two and one-half or three years in the program. Intensive summer sessions for two or three summers and a combination of language maintenance and regular language courses during the academic year should enable students to achieve the required proficiency. Other languages of the Pacific region may also be used to fulfill the foreign language requirement.

Certification of advanced language competence (Level 3 for Chinese and Japanese, 3+ for Spanish) will be available to students who wish to devote extra time and effort. Ordinarily only students who enter with intermediate language skills or who spend three years in the program will be able to achieve this level.

### **Quantitative Methods Laboratory:**

This year-long two-unit laboratory will be taught in conjunction with the Economics Core Sequence and will use standard software packages on microcomputers.



## INTERNATIONAL RELATIONS AND PACIFIC STUDIES GRADUATE SCHOOL

Students will learn basic statistics, statistical decision theory, linear programming, scheduling, nonlinear programming, simulation, and forecasting as they use these tools to solve economic decision problems.

### **IV. Applications: Policy Workshops (three courses, six units) and Internships**

#### **Policy Workshops**

The master's program is capped by the students' participation in a full-year, two-unit policy workshop during the final year. Students work together on problems in business or governmental strategy designed to simulate work situations. The workshops give students the opportunity to apply their knowledge and skills in situations similar to those they will confront in their professional work. Each quarter of the workshop introduces materials intended to develop analytical, technical, and communications skills. Students are required to complete a policy report which serves in lieu of a thesis or comprehensive final examination.

#### **Internships (optional)**

Students are encouraged to participate in various internship programs that are available in business and industry, in federal and state government, and through various foundations and institutions. The school has begun establishing links to a number of programs with available internships.

### **The Ph.D. Program**

The program leading to the doctor of philosophy in international affairs is designed for students of outstanding ability who wish to do advanced work in preparation for careers in university teaching and research or as international affairs researchers and specialists in business, government, consulting, or research organizations. The number of students admitted to the program each year is small and, within the general requirements described below, programs of study are designed to fit individual interests.

#### **Requirements for Admission**

Students who wish admission to the program must have a B.A. or equivalent in any field. Preference will be given to students with prior academic records of distinction and to those who have a background in one of the geographical areas or fields of emphasis covered in the program. The GRE (Verbal, Quantitative, and Analytical) is required of all applicants.

### **Program of Study**

The Ph.D. program aims to prepare students for research careers in international affairs dealing with the Pacific region. The program is designed to combine the analytic skills of specific disciplines with interdisciplinary analysis of policy issues. The program also exposes students to both public and private perspectives on these issues. In contrast to doctoral programs within existing social science departments which follow the intellectual agendas of their disciplines, the Ph.D. program in international affairs takes an interdisciplinary approach to the policy issues of the Pacific region.

MPIA students who decide to transfer to the Ph.D. program will find that the courses they have taken in the master's program, although not designed for advanced research-oriented Ph.D. training, will be useful and contribute to their progress in the Ph.D. program. There are no formal course requirements for the major and minor fields in the Ph.D. program; therefore there is no issue of formal course credit for courses already taken in the master's program. However, because the knowledge that MPIA students have acquired in these master's courses will aid them in preparing for their Ph.D. comprehensive examinations, the MPIA students can expect to reach this point in the Ph.D. program in less than the usual two years.

Students' knowledge of their major and minor fields is evaluated by comprehensive examinations. Their knowledge of the Pacific region is demonstrated through their work in four courses dealing with a country or subregion in the Pacific. Before students are permitted to sit for their comprehensive examinations they must submit an extended research paper, usually prepared for a course, which demonstrates to their Program Advisory Committee that they have the skills to undertake dissertation research.

Each student is assigned a Program Advisory Committee of three faculty members, two of whom must be faculty members in the school. With this committee, the student works out a plan of study which the committee must approve.

Students must select a major and a minor field.

#### **The Major Field and Minor Field (evaluated by comprehensive examination):**

Economic Policy or  
International Relations or  
Comparative Policy Analysis

Although there are no specific course requirements for the major and minor fields, students must demonstrate through comprehensive examinations that they have acquired a strong foundation in the theories and methods of the relevant disciplines as well as the ability to apply this disciplinary knowledge to the analysis of policy problems. Course work in the major and minor fields may be in both IR/PS and other departments. Students must design and make satisfactory progress in a coherent program of course work and reading courses in the major and minor fields which meets the approval of their Program Advisory Committee.

### **Pacific Region Issues**

Students must take at least four courses on policy processes and issues in the Pacific region. These courses may consider the Pacific region as a whole, a subregion, or individual countries. The courses may be in both IR/PS and other departments. Some students may choose to take more than the minimum four courses to deepen their knowledge of a particular country or area. The courses in Pacific region issues must be approved by the Program Advisory Committee.

### **Graduate Policy Seminar**

All students must participate in the Graduate Policy Seminar for at least two quarters. This seminar will bring together advanced Ph.D. students and faculty to discuss policy issues in the Pacific region. The course will require students to make presentations of literature reviews, research papers, and a dissertation prospectus.

### **Skill Requirement**

Students must satisfy the following skill requirements:

1. Basic Requirements: All Ph.D. students must have at least a rudimentary knowledge of statistics *and* a foreign language. The course requirements are:

Quantitative Methods: the equivalent of one course in statistics, *and*  
Foreign Language: the equivalent of two years of college level foreign language.

2. Advanced Requirements: To prepare for carrying out independent research students must have *either* advanced competence in quantitative methods *or* foreign language. The choice will depend on each student's research interests and professional goals. Some

students may devote the extra time and effort required to achieve advanced competency in both quantitative methods and foreign language. The course requirements are:

Quantitative Methods: the ability to use advanced methods of statistical data analysis and mathematical modeling in research; certified by courses or examination, or

Foreign Language: a research working knowledge, as certified by a written and oral examination.

### Examinations

Students will normally prepare for comprehensive examinations by taking course work offered by the school and related disciplinary departments. At least one-third of the total courses must be in IR/PS. Courses should be taken at the graduate level. Ph.D. students may enroll in IR/PS courses designed for the MPIA students, but they will be subject to additional research and writing requirements. Students who have completed the degree requirements for the MPIA degree at UCSD and students who have completed master's programs at other universities may discuss with the Program Advisory Committee ways of adapting their previous course work to the Ph.D. program.

Students must satisfactorily complete an extended research paper (usually done in conjunction with a course) which is approved by the Program Advisory Committee.

### Qualifying Examinations

Students must pass written and oral comprehensive examinations in their major and minor fields. These exams will be administered by a committee of faculty from the school.

Students must be examined on their dissertation prospectus by their Dissertation Committee.

### Dissertation

Students must complete a dissertation which makes a substantial contribution to knowledge commensurate with the standards of the University of California to receive the Ph.D. degree.

### Dissertation and Oral Defense

Students must be examined on their dissertation by their Dissertation Committee.

## Courses

Since copy for the UCSD *General Catalog*, 1987-88, was prepared before administrative review of the MPIA and the Ph.D. degrees had been completed, specific course descriptions were not available. They may be obtained through the school's administrative offices once this administrative review is complete.

## ITALIAN STUDIES

OFFICE: 3070 Humanities and Social Sciences Building, Muir College (CAESAR Office)

### Assistant Professors:

Jack Greenstein, Ph.D. (*Visual Arts*)

Stephanie Jed, Ph.D. (*Italian and Comparative Literature*)

John Marino, Ph.D. (*History*)

Jon R. Snyder, Ph.D. (*Italian and Comparative Literature*)

Italian Studies is an interdisciplinary program in the language, literature, history, and art of Italy. Italian Studies coordinates the resources of the Departments of History, Literature, and Visual Arts, and offers students the opportunity to design a major, leading to a B.A., around the course offerings of these three departments. Students in Italian Studies are encouraged to participate in the University of California Education Abroad Program (EAP), which is affiliated with the Universities of Padua, Venice, and Bologna: this provides the possibility of a junior year abroad, including both language courses and courses dealing with various aspects of Italian Studies. EAP credits may be transferred back to UCSD to coordinate with on-campus offerings.

### The Major Program

A major in Italian Studies consists of a choice of twelve upper-division courses in literature, history, and visual arts approved for the program and listed below. Each of the three areas (literature, history, and visual arts) must be represented in the student's program of study, with at least two courses from each field. The particular courses making up each student's major will be selected in consultation with the program adviser. Literature 151 (Dante) is a required course for all Italian Studies majors. In the senior year, each student is required to take a directed readings tutorial (199) and write an essay under the supervision of the chosen instructor.

### The Minor Program

A minor in Italian Studies consists of six upper-division courses from among those listed below (two each from literature, history and visual arts). Credit for three courses from the EAP program may be applied toward the minor.

Additional courses counting toward a major in Italian Studies are offered on a year-to-year basis. As these often cannot be listed in the catalog in advance, interested students should consult the program faculty for an up-to-date list.

### Upper-Division/Italian Studies Courses

For description of courses listed below, see appropriate departmental listing.

#### Literature

- Lit/It 100 Introduction to Italian Literature
- Lit/It 101 Advanced Stylistics and Composition
- Lit/It 110 Studies in Modern Italian Culture
- Lit/It 120 Ariosto and Language of Warfare
- Lit/It 123 Studies in Modern Italian Poetry
- Lit/It 124 Studies in Modern Italian Prose
- Lit/It 148 Selected Topics in Italian Literature (may be repeated for credit as topics vary)
- Lit/It 151 Dante: The *Divina Commedia*
- Lit/It 190 Seminar
- Lit/It 198 Directed Group Study
- Lit/It 199 Special Studies

N.B.: A prerequisite for all upper-division work in Italian literature, for majors in the Italian Studies Program, is the first- and second-year language sequence (Italian 1, 2, 3, 50, and 51)

#### Visual Arts

- 123A Italian Art of the Early Renaissance
- 123B High Renaissance Art
- 123C Michelangelo
- 123D The City in Italy
- 128C Topics in Medieval, Renaissance, and Baroque Art (when on an Italian topic)
- 129C Special Problems in Medieval, Renaissance and Baroque Art (when on an Italian topic)

#### History

- 105A Early Renaissance Italy: Dante to the Medici (1300-1494)
- 105B Late Italian Renaissance: Age of Michelangelo (1494-1564)
- 106B Politics, Italian Renaissance Style
- 125 Italy Since 1860
- 197 Field Study
- 198 Directed Group Study
- 199 Independent Study for Undergraduates

## JUDAIC STUDIES

### JAPANESE STUDIES

OFFICE: 3084 Humanities and Social Sciences Building, Muir College

#### Faculty:

- T. J. Cheng, *Assistant Professor*  
(*Graduate School of International Relations and Pacific Studies*)  
Haruko Cook, *Visiting Lecturer*  
(*Japanese Language*)  
Peter Cowhey, *Associate Professor*  
(*Graduate School of International Relations and Pacific Studies*)  
John W. Dower, *Professor (History)*  
Floyd Gaffney, *Professor (Theatre)*  
Miles Kahler, *Professor*  
(*Graduate School of International Relations and Pacific Studies*)  
Lawrence Krause, *Professor*  
(*Graduate School of International Relations and Pacific Studies*)  
S.-Y. Kuroda, *Professor (Linguistics)*  
John McMillan, *Professor*  
(*Graduate School of International Relations and Pacific Studies*)  
Masao Miyoshi, *Professor (Literature)*  
Masato Nishimura, *Visiting Lecturer*  
(*Japanese Language*)  
Roger Reynolds, *Professor (Music)*  
Joji Yuasa, *Professor (Music)*

This program offers undergraduates an opportunity to study the history, culture, society, and language of Japan. The program utilizes the coordinated resources of the humanities and social science departments (such as the Departments of Economics, History, Literature, Linguistics, Music, Political Science, and Theatre); it also maintains connections with the Graduate School of International Relations and Pacific Studies, the Program in Chinese Studies, and the Institute on Global Conflict and Cooperation. At present, the Program in Japanese Studies focuses on an interdisciplinary minor program. Qualified students who wish to pursue a major in Japanese studies, however, may do so on an *ad hoc* basis.

#### The Minor Program

A minor in Japanese studies consists of six courses, at least three of which are upper division. The courses must be taken in at least two different departments, and approved by the student's college as well as the Program in Japanese Studies. Study of the Japanese language is strongly encouraged, but not required. Japanese language courses may be used to satisfy the minor requirement as lower-division courses. The following courses are applicable toward the minor:

### Courses History

- 80A. Japan to 1600  
80B. Japan since 1600  
180A. Ancient Japan and the Courtly Society  
180B. Japan in the Age of the Samurai  
180C. Japan's Emergence as a Modern State  
180D. Pearl Harbor and Hiroshima: World War Two in Asia  
180E. Occupied Japan and the Cold War in Asia  
180Q. Colloquium on Modern Japanese History

### Language

(all courses offered annually)

- 11-12-13. First-Year Japanese  
21-22-23. Second-Year Japanese  
111-112-113. Third-Year Japanese  
121-122-123. Fourth-Year Japanese

### Literature

(at least two courses to be offered annually)

**Lit/Gen 152. Earlier Japanese Literature in Translation**  
(Quarter offerings will vary among A. General Literature; B. Poetry; C. Prose Fiction; D. Drama; and E. Essays, travelogues, diaries, etc.)

**Lit/Gen 153. Later Japanese Literature in Translation**  
(Quarter offerings will vary among A. General Literature; B. Poetry; C. Prose Fiction; D. Drama & Film; and E. Essays, criticism, etc.)

**Lit/Gen 154. A Single Japanese Author (in translation)**

**Lit/Gen 155. Special Topics in Japanese Literature**

**Lit/Gen 156. Japanese Literary Works/Writers in Japanese**

### Political Science

**Political Science 133A. Introduction to Japanese Politics**

**Political Science 133C. Comparative Political Economy of Japan**

### Graduate School of International Relations and Pacific Studies

Some of the courses offered in the graduate school pertaining to Japan may be available to undergraduate students with permission of the instructor. These courses may be used toward a minor.

## JUDAIC STUDIES

OFFICE: 3070 Humanities and Social Sciences Building, Muir College  
(CAESAR office)

#### Coordinator:

Richard E. Friedman, Ph.D.

The Judaic Studies Program is an interdisciplinary program offering courses, majors, minors, and concentrations in Judaic studies which draw upon a variety of perspectives. Courses are offered in the Departments of History, Literature, Political Science, and Philosophy.

### Major

Requirements for the major in Judaic studies are:

1. Judaic Cultural Traditions 1A-B-C.
2. Twelve upper-division courses in Judaic studies, to be selected in consultation with a faculty adviser.
3. Upper-division competence in Hebrew, normally to be fulfilled by completion of first- and second-year Hebrew language courses, or equivalent.

Students whose principal interest is in Judaic studies also have the following options:

- I. Within the Classical Studies Program, students may pursue a major concentrating upon Hebrew/Biblical courses offered in the Departments of Literature, History, and Philosophy.
- II. Within the general literature major in the Department of Literature, students may concentrate on Judaic literature or on a combined program of Judaic and classical literature.

In addition, Revelle and Muir Colleges have noncontiguous minors in Judaic studies; Warren College has Judaic studies concentrations; and various general requirements in all colleges can be met by courses in the Judaic area. For details students should inquire at their provost's office or at the Judaic Studies office.

UCSD students are eligible for participation in the UC Education Abroad Programs in Jerusalem and Haifa.

### Courses

Following are course offerings in this area.

*For descriptions of the courses listed below, refer to the appropriate department's section of the catalog.*

#### Cultural Traditions, Judaic 1A-B-C. (4-4-4)

(Also listed as Philosophy 30A-B-C.)

The three-quarter sequence is the primary introduction to Judaic studies, covering the roots of Judaic culture, addressing itself to social, political, religious, and artistic aspects of the culture.

#### Hebrew 1. Beginning Hebrew (4)

Acquisition of basic vocabulary, fundamentals of Hebrew grammar, conversation and reading.

**Hebrew 2. Intermediate Hebrew (4)**

Continued study of vocabulary and grammar, emphasis on fluency in conversation and reading.

**Hebrew 3. Intermediate Hebrew, Continued (4)**

Vocabulary, grammar, conversation, introduction to literary and nonliterary texts.

**Hebrew 101. Introduction to Hebrew Texts (4)**

Reading and analysis of texts from Biblical through modern authors, study of advanced vocabulary and grammar. Course taught in Hebrew and in English.

**Hebrew 102. Intermediate Hebrew Texts (4)**

Further reading and analysis of Hebrew literature from a range of periods. Advanced grammar and vocabulary. Course taught in Hebrew and in English.

**Hebrew 103. Advanced Hebrew Texts (4)**

Synthesis of fluency, reading, and grammatical skills. Reading of texts from a range of periods.

**Judaic Studies 105. Modern Jewish Thought (4)****History 100. Ancient Near East and Israel (4)****History 127. European Jewry 1760-1960 (4)****History 132A. The Rise of Christianity (4)****History 199. Independent Study for Undergraduates (4)****Lit/He (Lit/Gen) 104. The Bible and Western Literature (4)****Lit/Gen 108. The Jewish Experience in Literature (4)****Lit/Gen 109. Jewish Mysticism (4)****Lit/He (Lit/Gen) 110. Bible: The Prophetic Books (4)****Lit/He (Lit/Gen) 111. Bible: The Narrative Books (4)****Lit/He (Lit/Gen) 112. Bible: The Poetic Books (4)****Lit/He (Lit/Gen) 113. Medieval Hebrew Literature (4)****Lit/He (Lit/Gen) 114. Hebrew Literature: The Modern Period (4)****Lit/He (Lit/Gen) 115. Topics in the Prophets (4)****Lit/He (Lit/Gen) 116. Topics in Biblical Narrative (4)****Lit/He (Lit/Gen) 117. Topics in Biblical Poetry (4)****Lit/Gen 119. Mythology (4)****Lit/Gen 157. Yiddish Literature in Translation (4)****Lit/He 190. Seminars (4)****Lit/Gen 195. Apprentice Teaching (0 and 4)**

Courses cross-listed as Lit/He and Lit/Gen may be taken as Hebrew literature by students proficient in the language or as general literature by students without knowledge of Hebrew.

**Lit/He 197. Field Study: Archaeology and the Bible (4 to 8)**

(Offered in Summer Session)

**Lit/He 198. Directed Group Study (4)****Lit/He 199. Special Studies (4)****Lit/Co 210. Classical Studies (4)****Lit/Co 297. Directed Studies (4)****Lit/Co 298. Special Projects (4)****Philosophy 160A-B. Philosophy of Religion (4-4)****Political Science 121A and 121B. Governments and Politics of the Middle East (4-4)****Political Science 121C and 121D. The Arab-Israeli Conflict (4-4)****LANGUAGE**

See particular languages under linguistics (beginning and intermediate) or literature (advanced).

**LATIN LITERATURE**

See Literature.

**LAW AND SOCIETY**

OFFICE: Interdisciplinary Programs,  
Building 405, Matthews Administrative  
and Academic Complex

Law and society is an interdisciplinary minor that emphasizes the complexity and interrelationship of legal, social, and ethical issues in their historical context. Although it is administered by Warren College, it is available to all UCSD students considering law-related careers or those with a general interest in law as a social institution. The purpose of the program is to enhance students' critical analysis of social and ethical issues related to law and of the legal implications and ramifications of policy and decision making in their major fields of study. Students examine the role of the legal system and specific legal issues from the perspectives of the social sciences and humanities. Social forces, historical questions, and issues of values will be considered in the context of the legal system. The focus of the minor is on the process of law — how the law both reflects and defines basic social values — and its relation to the political, economic, and social conflicts within society.

The interdisciplinary content of the law and society minor offers UCSD students the opportunity to examine law-related issues from the perspectives of a broad range of disciplines including: communication, economics, history, linguistics, philosophy, political science, psychology, sociology, and urban studies and planning. To insure an interdisciplinary learning experience, students must include in their program at least one course from each of the following "core" academic departments: history, philosophy, political science, and sociology.

Students should consult an academic adviser in their college provost's office to determine how the law and society minor can best meet their college's graduation

requirements. Students who complete the law and society course work but do not use it as a minor may still earn credit by electing to have a special notation placed on their transcript certifying completion of the course work. Transcript Notation Requests must be obtained from and approved by the Interdisciplinary Programs Office. Declarations (forms officially designating law and society a minor and listing the specific course work selected by the student) and petitions (forms requesting changes in or exceptions from course requirements) for the law and society minor must first be reviewed and approved by the coordinator of Interdisciplinary Programs and then by the students' college academic advising office.

Students are strongly urged to supplement the law and society minor with a law-related internship. Both local and out-of-town internships are available to juniors and seniors with at least a 2.5 grade-point average through the Academic Internship Program, located in Building 406, Matthews Administrative and Academic Complex. The Academic Internship Program offers local placements with lawyers, judges, elected officials, government offices, and public interest groups. In addition, placements are available in Washington, D.C. with senators, representatives, legislative committees, and political action committees. Students may earn from four to sixteen units of academic credit for the internship experience.

A number of extracurricular events and programs are also available to students interested in law. Warren College sponsors the annual Earl Warren Symposium dedicated to the analysis of a socially relevant legal topic. The symposium includes lectures and discussions by members of the legal community and the UCSD faculty, informal debates, student panels, and a moot court presentation. Selected students from community high schools are invited to attend, along with their instructors. The symposium is open to all UCSD students, staff, and faculty as well as to the community at large.

Information, workshops, and additional law-related programs are also offered by the Career Services Center, the student Pre-Law Education Association (PLEA), and faculty advisers in the academic departments. Further information on these programs and activities is available at the Interdisciplinary Programs Office, 405 Matthews Administrative and Academic Complex.

## LINGUISTICS

### Law and Society Minor Requirements

The minor consists of six courses. To ensure an interdisciplinary learning experience, students must include at least one course from each of the following "core" academic departments: history, philosophy, political science, and sociology. The concluding course, Law and Society 101, may be counted as either political science or sociology.

#### Required Introductory Courses

1. Political Science 40 — Introduction to Law and Society
2. One of the following four courses:  
History 154A or 154B — Legal and Constitutional History of the U.S.;  
Political Science 104A — Law and Politics — The Supreme Court; or  
Political Science 104B — Civil Rights and Civil Liberties.
3. One of the following two courses:  
Philosophy 162 — Philosophy of Law, or  
Sociology 140 — Sociology of Law.

**Elective Course Options** — Two courses to be chosen from the following:

#### History:

- 129 — Origins of Common Law
- 157 — Trials of America

#### Philosophy:

- 12 — Logic and Decision-Making
- 120 — Political Philosophy
- 121 — The State and Freedom
- 124 — Contemporary Moral Issues
- 127 — Professional Ethics

#### Political Science:

- 102H — Political and Legal Foundations of the American Economy
- 104F — Constitutional Law Seminar
- 105A — Comparative Legal Cultures
- 105B — Law and Social Policy
- 140A — International Law
- 145D — The International Business Environment: Law and Society

#### Sociology:

- 141 — Crime and Society
- 142 — Social Deviance
- 144 — Forms of Social Control
- 159 — Special Topics in the Sociology of Organizations and Institutions (by approval, when the topic is law-related)
- 190 — Senior Seminar (by approval, when the topic is law-related)

Additional law-related electives are often available from other departments, including the Departments of Communication, Economics, Linguistics, Literature, Psychology, and Urban Studies and Planning. For a current list of approved elec-

tives, contact the Interdisciplinary Programs Office, 405 Matthews Administrative and Academic Complex.

#### Required Concluding Course

Law and Society 101 — Contemporary Legal Issues

#### Recommended Internship Experience

Law-related internship (AIP 197): To be arranged at least one quarter in advance through the Academic Internship Program, 406 Matthews Administrative and Academic Complex. Ten hours a week for two quarters (eight units of credit) or twenty to thirty hours a week for one quarter (eight to twelve units) is recommended.

#### Courses

As indicated above, most course work for the Law and Society minor is listed under the academic department providing instruction. Law and Society 101, the required concluding course described below, is an interdisciplinary course. It may be counted toward minor requirements as either political science or sociology. Students should consult the Warren College Interdisciplinary Programs Office for further information on Law and Society 101.

#### Upper Division

##### 101. Contemporary Legal Issues (4)

This course will deal in depth each year with a different legal issue of contemporary significance, viewed from the perspectives of political science, history, sociology, and philosophy. Required for students completing the Law and Society minor. *Prerequisite: Political Science 40 or consent of instructor. May be repeated for credit once, for a maximum total of eight units.*

## LINGUISTICS

OFFICE: 5237 Psychology and Linguistics Building, Muir College

#### Professors:

Matthew Y. Chen, Ph.D.  
Edward S. Klima, Ph.D.  
S. Y. Kuroda, Ph.D.  
Ronald W. Langacker, Ph.D.  
Margaret Langdon, Ph.D. (*Chairman*)  
Leonard Newmark, Ph.D.  
David M. Perlmutter, Ph.D.  
Sanford A. Schane, Ph.D.  
Tracy D. Terrell, Ph.D.

#### Associate Professor:

Jeffrey L. Elman, Ph.D.

\* \* \*

Linguistics is the study of language. Like other rapidly developing fields, linguistics resists simple classification into one of the traditional categories of academic disciplines. As one of the humanities, linguistics is concerned with the historical development of a particular language or language family, or with the relation between language and literature. As a social science, linguistics may be related to anthropology, in describing language as part of culture; or it may be related to psychology, in describing language as a kind of human behavior. One branch of linguistics, phonetics, may even be considered a natural science, related to the physical science of acoustics and the biological sciences of anatomy and physiology. As an applied science, linguistics has found many applications in fields as far apart as language pedagogy, speech therapy, and computer programming. Finally, linguistics may be considered a formal science in its own right, related to mathematics and formal logic.

The Department of Linguistics at UCSD also offers elementary and intermediate instruction in a variety of foreign languages.

### The Major Program

An undergraduate major in linguistics is intended to give students the background that will best prepare them for graduate work in this field. Because linguistics shares its object matter — language — with so many other disciplines, this major is unlike many others in that it does not require that all courses be taken in the major department itself. The major in linguistics will consist of twelve upper-division courses: eight upper-division courses in linguistics (including Linguistics 110, 111, 120, 121, and 130), and four additional upper-division courses from linguistics and/or from other departments but relevant to the study of language. These four courses may be taken in departments other than linguistics: for instance, the Departments of Mathematics, Electrical Engineering and Computer Sciences, Philosophy, Psychology, Anthropology, Sociology, Communication, or Literature. These courses need not be taken in the same department, but they must form a coherent program of study in conjunction with the required core of linguistics courses. The courses to complete the major are selected in consultation with the student's linguistics adviser.

For all courses counted toward the linguistics major, the student must receive grades of C or better. Courses counted



toward the major may not be taken on a Pass/Not Pass basis, except Linguistics 198 or 199.

All linguistics majors must satisfy Language Requirements I and II.

*Revelle:* For Revelle College only, the classification of the linguistics major as humanities, natural science, or social science must be determined on the basis of each student's specific program. The classification of the major program will in turn determine what areas will be acceptable for the noncontiguous minor.

*Warren:* For Warren College only, any courses taken in departments other than linguistics may not overlap with the student's outside area(s) of concentration.

### HONORS PROGRAM

The department offers an honors program for outstanding students. Those students who have a 3.75 GPA in linguistics (3.25 overall) at the end of their junior year are eligible to participate. Students interested in participating in the honors program should consult with their department adviser: admission to the program requires nomination by the adviser and approval of the department faculty.

In addition to the major requirements for graduation, the honors program requires two graduate linguistics courses and one quarter of 199H during which an honors paper is written. Responsibility for arranging the honors independent study with a professor rests with the student. Upon successful completion of the requirements the designation "with distinction", "with high distinction", or "with highest distinction" will appear on the student's diploma.

### LANGUAGE REQUIREMENT I:

The student must achieve proficiency in French, German, Spanish, or Russian. Proficiency is established by passing a reading proficiency examination as well as passing an oral interview administered by the department.

### LANGUAGE REQUIREMENT II:

The student must achieve competence in at least one additional foreign language. Competence is defined as successful completion (with grades of C- or better) of three four-unit courses or the equivalent in a second language.

### Independent Study and Directed Group Study in Linguistics for Majors

Upon presentation of a written study proposal or project, and with the consent

of the instructor and the adviser, linguistics majors with at least a 3.5 GPA in the major courses may request permission to undertake directed group study in linguistics (Linguistics 198) or independent study in linguistics (Linguistics 199). No more than one such course (to be taken Pass/Not Pass) may count toward the major. (Linguistics 198 or 199 will not qualify as one of the minimum eight courses in linguistics proper, but may be used as one of the four additional courses.)

### The Minor Program

*Muir, Third, and Warren:* For Muir, Third, and Warren Colleges only, the linguistics minor consists of six courses: Linguistics 10, 110, 111, 120, and 121, plus one additional upper-division course in linguistics.

*Revelle:* For Revelle College only, the linguistics minor consists of six courses including Linguistics 110, 120, and one additional upper-division course in linguistics. Two of the remaining minor courses must be upper-division courses relevant to the study of language but may be taken in departments other than linguistics: for instance, the Departments of Mathematics, Electrical Engineering and Computer Sciences, Philosophy, Psychology, Anthropology, Sociology, Communication, or Literature. These courses need not all be taken in the same department, but they must form a coherent program of study. The courses to complete the minor are selected in consultation with the departmental undergraduate adviser. The content of these courses will determine whether the linguistics minor is classified as humanities, natural science, or social science.

For all courses counted toward the linguistics minor, the student must receive grades of C- or better. Courses counted toward the minor may not be taken on a Pass/Not Pass basis, except Linguistics 198 or 199.

### The Ph.D. Program

The Department of Linguistics offers a Ph.D. program that is unique in its primary emphasis on modern linguistic theory combined with serious study of a wide range of languages and language families from around the world, in particular Albanian, American Indian, Austronesian, Chinese, Japanese, and Romance. This emphasis is complemented by unusually strong offerings and research interests in grammatical theory, comparative-historical linguistics, American Sign Lan-

guage, experimental phonetics, formal linguistics, and anthropological linguistics. The department has a wide array of research facilities. The phonetics laboratory contains a full complement of modern equipment for research in acoustic and articulatory phonetics as well as speech perception. The phonetics laboratory houses various computer systems; the department also has ready access to the campus Computer Center. In addition to the extensive linguistics holdings in the main library, the department maintains a reading room with a good collection of research reports, dissertations, and unpublished papers. Access to the libraries of other UC campuses exists through inter-library loan.

The department's language laboratory maintains a library of written and recorded materials permitting independent study of dozens of common and "exotic" languages. Since the Department of Linguistics directs foreign language instruction for the campus through its lower-division language courses many opportunities are provided for instruction and research in second language acquisition.

The department has its own excellent tape and videotape recording facilities for work in sociolinguistics, anthropological linguistics, psycholinguistics, and the sign language of the deaf. The Center for Research in Language facilitates research over a broad range of projects concerned with theoretical and applied problems. Finally, UCSD is well located from the standpoint of availability of native speakers of a wide variety of languages.

In the first two years of graduate study, the student's basic courses will stress linguistic theory, and linguistic analysis. For advanced work, students will choose an area of specialization based on individual interests.

### Preparation

Since linguistics is a highly technical and analytic field, linguistics students will find their undergraduate training in mathematics and the natural sciences especially valuable. Undergraduate work in certain of the social sciences and humanities, particularly psychology, anthropology, philosophy and literature, is also good preparation for linguistics. Applicants are expected to have substantial experience with foreign languages. Students with no previous course work in linguistics proper are advised to become acquainted with the fundamentals of contemporary linguistic theory prior to enroll-

## LINGUISTICS

ment. Students who, upon admission, are deficient either in their formal linguistics preparation or languages will be advised by the department on how to make up the deficiency. Because the basic graduate courses offered by the Department of Linguistics are organized in sequences, new graduate students will be admitted only in the fall of any academic year.

### Language Requirements

A candidate for the Ph.D. degree must demonstrate: (1) Conversational ability in *one* language other than English. (2) A reading knowledge of *two* languages, to be chosen from: French, German, Russian, and Spanish. If Spanish is chosen, the student must also demonstrate conversational ability in Spanish. A student whose native language is not English may use English as one of the languages to satisfy the reading knowledge requirement, the other being one of the four languages above which is not his or her first language.

### Required Courses

Candidates for the Ph.D. must pass certain graduate courses prior to taking the qualifying examination. These include at least five courses in the general area of syntax/semantics; at least four courses in the general area of phonology/phonetics; a two-quarter field methods sequence; one course in the history of linguistics; and one course in historical linguistics.

### Departmental Examinations

Candidates for the Ph.D. degree must pass both the comprehensive examination and the qualifying examination. The comprehensive examination, taken near the end of the second year of graduate study, gauges the student's general familiarity with the theory and methodology of two central areas of modern linguistics: syntax/semantics and phonetics/phonology.

The qualifying examination is an oral examination which tests the student's knowledge in the area of specialization. Prior to taking this examination, the student must pass the comprehensive examination, satisfy all language requirements, successfully complete all required courses, and demonstrate — through research papers — the ability to carry out independent, dissertation-level research. Most students take the qualifying examination after three or four years of graduate work.

### Apprentice Teaching

As part of their preparation for a future academic career, graduate students in linguistics at UCSD are given special opportunities to participate in teaching programs under the supervision of a professor. Depending on qualifications, students may conduct conversation or analysis classes in lower-division language courses, or may assist a professor in the teaching of a graduate or undergraduate linguistics course.

### Dissertation

The candidate for the Ph.D. will write a substantial dissertation incorporating the results of original and independent research carried on under the supervision of the doctoral committee. The candidate will be recommended for the doctor of philosophy degree after having made a successful oral defense of the dissertation before the doctoral committee and after having the final typed version of the dissertation accepted by the Central University Library.

### Other Degrees

Candidates for the Ph.D. may be granted the M.A. in linguistics or in linguistics with specialization in TESOL upon completion of certain graduate requirements. Candidates for either M.A. degree must satisfactorily complete thirty-six units of graduate course work (including certain specific courses), pass the departmental comprehensive examination, and demonstrate a reading knowledge of *one* language, to be chosen from: French, German, Russian, and Spanish. If Spanish is chosen, the students must also demonstrate conversational ability in Spanish. A student whose native language is not English may use English to satisfy this requirement. Upon arrival at UCSD, students interested in the M.A. in linguistics with specialization in TESOL should consult with the departmental TESOL adviser for information on additional requirements for that degree.

Candidates for the Ph.D. may also be granted the C. Phil. upon completion of all degree requirements other than the dissertation.

### Language Courses

OFFICE: Language Center, 2125  
Psychology and Linguistics  
Building, Muir College

Students planning to take a sequence of lower-division courses in a foreign language should use the following guidelines. Students at the elementary level of a language should begin their study with Linguistics 31/51. Students who have studied a language for two or three years in high school (or one term at college) within the past four years may enroll in Linguistics 32/52. Students who have studied a language for four years in secondary school (or for two terms in college) may enroll in Linguistics 33/53 or Linguistics 34/54 if their speaking and reading ability is good; otherwise they should enroll in 32/52. Students who have the equivalent of four years of secondary school training (or three terms in college) in a language and who consider themselves able to carry on ordinary conversation and read everyday material in the language may take the basic language proficiency test given by the Department of Linguistics. If they have that proficiency, they may proceed directly into courses offered by the Department of Literature.

Courses numbered Linguistics 31-32-33-34 consist of a combination of small tutorial meetings with a native speaker, plus reading and assigned laboratory work. Courses numbered 51-52-53-54 consist of weekly group conferences led by a linguist, assigned laboratory work, and outside reading. Each course in the 31-32-33-34 series must be taken concurrently with the corresponding course in the 51-52-53-54 series.

Courses numbered Linguistics 11 are self-instructional courses intended for students whose interest in learning the language is only to read it for scholarly purposes. They are particularly aimed at graduate students preparing to fulfill French or German reading requirements.

The Language Laboratory at UCSD offers a rich collection of materials that can be used for self-instruction in a variety of languages. To encourage students to take advantage of these materials, academic credit may be granted to students for introductory-level study of certain languages on a self-instructional basis in the Language Laboratory. Interested students should enroll in Linguistics 19. On the first day of the quarter students enrolled in Linguistics 19 must meet with a Linguistics 19 supervisor, who will establish a program of study and arrange for mid-term and final examinations. Depending on the availability of suitable materials in the Language Laboratory, Linguistics

19 courses may be offered for two, three or four units of credit and may, for some languages, be repeated for credit.

## CHINESE

See:  
Chinese Studies

## ENGLISH

### Ling/Eng 71. English as a Foreign Language: Sentence Combining (4)

In this class we examine variations in English sentence construction with the aim of strengthening writing skills and investigating stylistic choices available in written English.

### Ling/Eng 72. English as a Foreign Language: The Process of Composition (4)

The aim of this class is refinement of students' skills in writing competent university essays through the development of effective techniques of paragraph writing and essay organization.

### Ling/Eng 73. English as a Foreign Language: American Rhetoric (4)

This class concentrates on the fine points of the rhetorical devices used in American university writing, concentrating on developing skills in composition writing.

## FRENCH

### Ling/Fr 11. Elementary French Reading (2-4)

A self-instructional program designed to prepare graduate students to meet reading requirements in French. After a one-week introduction to French orthography/sound correspondence, students work with a self-instructional textbook. Mid-term and final examinations. (F,W,S)

### Ling/Fr 31. French Conversation (2)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 51. *Prerequisite: no prior study of French required.*

### Ling/Fr 32. French Conversation (2)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 52. *Prerequisites: two or more years of French in high school, or Ling/French 31 or equivalent.*

### Ling/Fr 33. French Conversation (2)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 53. *Prerequisite: Ling/French 32.*

### Ling/Fr 34. French Conversation (2)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 54. *Prerequisite: Ling/French 33.*

### Ling/Fr 51. Analysis of French (2)

An introduction to the academic study of French, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken with Ling/French 31. *Prerequisite: no prior study of French required.*

### Ling/Fr 52. Analysis of French (2)

Review and refinement of phonological, morphological, and syntactic elements of French and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/French 32. *Prerequisites: two years of high school study of the language, Ling/French 51, or equivalent.*

### Ling/Fr 53. Analysis of French (2)

Review and refinement of phonological, morphological, and syntactic elements of French and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/French 33. *Prerequisite: Ling/French 52.*

### Ling/Fr 54. Analysis of French (2)

Review and refinement of phonological, morphological, and syntactic elements of French and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/French 34. *Prerequisite: Ling/French 53.*

See also:  
Department of Literature

### Lit/Fr 10. Readings and Interpretations (4)

### Lit/Fr 25. Composition and Conversation (4)

### Lit/Fr 50. Readings in French Literature and Culture (4)

## GERMAN

### Ling/Ge 11. Elementary German Reading (2-4)

A self-instructional program designed to prepare graduate students to meet reading requirements in German. After a one-week introduction to German orthography/sound correspondences, students work with a self-instructional textbook. Mid-term and final examinations. (F,W,S)

### Ling/Ge 31. German Conversation (2)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 51. *Prerequisite: no prior study of German required.*

### Ling/Ge 32. German Conversation (2)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 52. *Prerequisites: two or more years of German in high school or Ling/German 31, or equivalent.*

### Ling/Ge 33. German Conversation (2)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 53. *Prerequisite: Ling/German 32.*

### Ling/Ge 34. German Conversation (2)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 54. *Prerequisite: Ling/German 33.*

### Ling/Ge 51. Analysis of German (2)

An introduction to the academic study of German, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken with Ling/German 31. *Prerequisite: no prior study of German required.*

### Ling/Ge 52. Analysis of German (2)

Review and refinement of phonological, morphological, and syntactic elements of German and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/German 32. *Prerequisites: two years of high school study of the language, Ling/German 51, or equivalent.*

### Ling/Ge 53. Analysis of German (2)

Review and refinement of phonological, morphological, and syntactic elements of German and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/German 33. *Prerequisite: Ling/German 52.*

### Ling/Ge 54. Analysis of German (2)

Review and refinement of phonological, morphological, and syntactic elements of German and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/German 34. *Prerequisite: Ling/German 53.*

See also:  
Department of Literature

### Lit/Ge 10. Readings and Interpretations (4)

### Lit/Ge 25. Composition and Conversation (4)

## GREEK

See:  
Department of Literature

## HEBREW

See:  
Judaic Studies

## ITALIAN

See:  
Department of Literature

## JAPANESE

See:  
Chinese Studies

## LATIN

See:  
Department of Literature

## PORTUGUESE

### Ling/Port 1-2-3. Fundamentals of Portuguese (4-4-4)

Introduction to spoken and written Portuguese. Includes extensive development of comprehension and speaking skills as well as training in the reading and writing of Portuguese. *Prerequisite: none.*

## RUSSIAN

### Ling/Ru 31. Russian Conversation (2)

Small tutorial meetings with a native speaker of Russian. Must be taken in conjunction with Ling/Russian 52. *Prerequisite: no prior study of Russian required.*

### Ling/Ru 32. Russian Conversation (2)

Small tutorial meetings with a native speaker of Russian. Must be taken in conjunction with Ling/Russian 52. *Prerequisites: two or more years of Russian in high school, or Ling/Russian 31, or equivalent.*

### Ling/Ru 33. Russian Conversation (2)

Small tutorial meetings with a native speaker of Russian. Must be taken in conjunction with Ling/Russian 53. *Prerequisite: Ling/Russian 32.*

### Ling/Ru 34. Russian Conversation (2)

Small tutorial meetings with a native speaker of Russian. Must be taken in conjunction with Ling/Russian 54. *Prerequisite: Ling/Russian 33.*

### Ling/Ru 35. Russian Conversation (2)

Small tutorial meetings with a native speaker of Russian. Must be taken in conjunction with Ling/Russian 55. *Prerequisite: Ling/Russian 34.*

### Ling/Ru 36. Russian Conversation (2)

Small tutorial meetings with a native speaker of Russian. Must be taken in conjunction with Ling/Russian 56. *Prerequisite: Ling/Russian 35.*

### Ling/Ru 51. Analysis of Russian (2)

An introduction to the academic study of Russian, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken with Ling/Russian 31. *Prerequisite: no prior study of Russian required.*

### Ling/Ru 52. Analysis of Russian (2)

Review and refinement of phonological, morphological, and syntactic elements of Russian and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Russian 32. *Prerequisites: two years of high school study of the language, Ling/Russian 51, or equivalent.*

### Ling/Ru 53. Analysis of Russian (2)

Review and refinement of phonological, morphological, and syntactic elements of Russian and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Russian 33. *Prerequisite: Ling/Russian 52.*

### Ling/Ru 54. Analysis of Russian (2)

Review and refinement of phonological, morphological, and syntactic elements of Russian and introduction to elements of the culture. Reading assignments in and about the lan-

## LINGUISTICS

guage discussed and tested in class. Must be taken with Ling/Russian 34. *Prerequisite: Ling/Russian 53.*

### Ling/Ru 55. Analysis of Russian (2)

Review and refinement of phonological, morphological, and syntactic elements of Russian and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Russian 35. *Prerequisite: Ling/Russian 54.*

### Ling/Ru 56. Analysis of Russian (2)

Review and refinement of phonological, morphological, and syntactic elements of Russian and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Russian 36. *Prerequisite: Ling/Russian 55.*

See also:

Department of Literature

### Lit/Ru 25. Readings and Interpretations (4)

### Lit/Ru 50. Readings in Russian Literature and Culture (4)

## SPANISH

### Ling/Sp 31. Spanish Conversation (2)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 51. *Prerequisite: no prior study of Spanish required.*

### Ling/Sp 32. Spanish Conversation (2)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 52. *Prerequisites: two or more years of Spanish in high school, or Ling/Spanish 31, or equivalent.*

### Ling/Sp 33. Spanish Conversation (2)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 53. *Prerequisite: Ling/Spanish 32.*

### Ling/Sp 34. Spanish Conversation (2)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 54. *Prerequisite: Ling/Spanish 33.*

### Ling/Sp 41. Intermediate Spanish for the Social Sciences (2)

This series of two-unit courses is to increase the student's language skills in order to interact professionally with native speakers of Spanish in the following areas: history, political science, sociology, economics, and general current political and economic affairs. Topics and materials will include grammar review, television news broadcasts, newspaper readings, classroom discussion, and essay writing. *Prerequisite: At least three semesters/four quarters of college Spanish or permission of instructor.*

### Ling/Sp 42. Intermediate Spanish for the Social Sciences (2)

This series of two-unit courses is to increase the student's language skills in order to interact professionally with native speakers of Spanish in the following areas: history, political science, sociology, economics, and general current political and economic affairs. Topics and materials will include grammar review, television news broadcasts, newspaper readings, classroom discussion, and essay writing. *Prerequisite: At least three semesters/four quarters of college Spanish or permission of instructor.*

### Ling/Sp 43. Intermediate Spanish for the Social Sciences (2)

This series of two-unit courses is to increase the student's language skills in order to interact professionally with native speakers of Spanish in the following areas: history, political science, sociology, economics, and general current political and economic affairs. Topics and materials will include grammar review, television news broadcasts, newspaper readings, classroom discussion, and essay writing. *Prerequisite: At least three semesters/four quarters of college Spanish or permission of instructor.*

### Ling/Sp 51. Analysis of Spanish (2)

An introduction to the academic study of Spanish, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret

and test reading assignments in and about the language. Must be taken with Ling/Spanish 31. *Prerequisite: no prior study of Spanish required.*

### Ling/Sp 52. Analysis of Spanish (2)

Review and refinement of phonological, morphological, and syntactic elements of Spanish and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Spanish 32. *Prerequisites: two years of high school study of the language, Ling/Spanish 51, or equivalent.*

### Ling/Sp 53. Analysis of Spanish (2)

Review and refinement of phonological, morphological, and syntactic elements of Spanish and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Spanish 33. *Prerequisite: Ling/Spanish 52.*

### Ling/Sp 54. Analysis of Spanish (2)

Review and refinement of phonological, morphological, and syntactic elements of Spanish and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with Ling/Spanish 34. *Prerequisite: Ling/Spanish 53.*

See also:

Department of Literature

### Lit/Sp 9. Readings and Interpretations: Spanish for Native Speakers (4)

### Lit/Sp 10. Readings and Interpretations (4)

### Lit/Sp 25. Composition and Conversation (4)

### Lit/Sp 50. Readings in Spanish Literature and Culture (4)

## DIRECTED STUDY

### Lang/19. Directed Study — Language (2-4)

Introductory-level study of a language in the Language Laboratory on a self-instructional basis. Depending on the availability of appropriate study materials, the course may be taken in blocks of two, three, or four units of credit and may be repeated up to the total number of units available for that language.

|                        |                |
|------------------------|----------------|
| Afrikaans              | Igbo           |
| Albanian               | Irish Gaelic   |
| American Sign Language | Italian        |
| Arabic (Iraqi)         | Japanese       |
| Arabic (Eastern)       | Kannada        |
| Arabic (Egyptian)      | Korean         |
| Arabic (Moroccan)      | Malay          |
| Arabic (Saudi)         | Mongolian      |
| Bengali                | Navajo         |
| Bulgarian              | Norwegian      |
| Burmese                | Polish         |
| Chinese (Cantonese)    | Portuguese     |
| Chinese (Mandarin)     | Romanian       |
| Czech                  | Russian        |
| Danish                 | Serbo-Croatian |
| Dutch                  | Spanish        |
| Esperanto              | Swahili        |
| Finnish                | Swedish        |
| French                 | Tagalog        |
| German                 | Thai           |
| Greek (Modern)         | Tibetan        |
| Haitian Creole         | Turkish        |
| Hausa                  | Ukrainian      |
| Hawaiian               | Vietnamese     |
| Hebrew (Modern)        | Welsh          |
| Hindi-Urdu             | Yoruba         |
| Hungarian              |                |

## LINGUISTICS COURSES

### Lower Division

#### 5. Introduction to Language (4)

An interdisciplinary approach to language. Topics, which vary from year to year, will be drawn from: languages of the world and the origin of language; the role of language in thought, advertising, law, communication, literature, social interaction, and mystical experiences; spoken and visual languages; and the question of whether other species can learn human language. Intended primarily for non-majors.

#### 10. Introduction to General Linguistics (4)

A general introduction to language and linguistics. Language as an instrument of communication. Aspects of the structure of English and other languages. Survey of linguistic sub-disciplines.

#### 63. Language of the Computer (4)

Differences between human and computer languages. Overview of UNIX and the roles played by hardware and software. Editors, word-processing programs, utilities, C-shell scripts.

## Upper Division

#### 103. Language and Consciousness (4)

Language and how it influences our perception of the universe; the Sapir-Whorf hypothesis. Psychological, physical, and linguistic aspects of space/time. The role of language in altered states of consciousness.

#### 105. Law and Language (4)

The interpretation of language in understanding the law: the language of courtroom interaction (eyewitness testimony, jury instructions); language-based issues in the law (free speech and the First Amendment, libel and slander); written legal language (contracts, ambiguity, 'legalese', legal fictions). Readings include case studies, legal articles, and linguistic texts. *Prerequisite: upper-division standing.*

#### 110. Phonetics (4)

Basic anatomy and physiology of the mechanisms used in speech. Acoustic phonetics and speech perception. Transcription and production. Introduction to phonological feature systems.

#### 111. Phonology (4)

Examination of phonological structure of natural languages. Exercises in phonological description. The empirical justification of phonological analyses.

#### 115. Advanced Phonology (4)

Current approaches to the sound structure and morphology of languages. Topics discussed may include suprasegmental as well as segmental phonology. *Prerequisite: Linguistics 111.*

#### 120. Grammatical Structure (4)

Basic introduction to lexical, morphological, and syntactic structure. The course surveys representative lexical and grammatical phenomena drawn from a variety of typologically and genetically distinct languages of the world. Concepts and techniques for the analysis of lexical and grammatical structure are learned through problem-solving exercises that apply them to actual language data.

#### 121. Syntax (4)

Introduction to the syntax of natural languages, with special reference to English. The empirical justification of syntactic analyses. Emphasis on problem solving and argumentation.

#### 125. Advanced Syntax (4)

Topics in the syntax of English and other languages. Syntactic theory and universals. *Prerequisite: Linguistics 121.*

#### 130. Semantics (4)

Introduction to the study of meaning. Survey of approaches to the analysis and description of semantic structure. Formal semantics and its application to natural language.

#### 141. Language Structures (4)

Detailed investigation of the structure of one or more languages. Languages and language families likely to be examined include Albanian, Austronesian, Chinese, Germanic, Japanese, Luiseño, Old Icelandic, Romance, Samoan, Slavic, Uto-Aztecan, Yuman, and others. Because the subject matter varies from quarter to quarter, this course may be repeated for credit.

#### 142. Language Typology (4)

The systematic ways languages differ. Cross-linguistic studies of specified topics (e.g., word order, agreement, case, switch reference, phonological systems and rule types, etc.) in an effort to develop models of language variation.

#### 143. Romance Linguistics (4)

Topics concerning the history or structure of the Romance languages. A survey of major syntactic, semantic, or phonological processes in one or more of these languages. Languages to be investigated include French, Spanish, Portuguese, and Italian. May be repeated for credit as topics vary.



**145. American Indian Linguistics (4)**

A survey of American Indian languages, their genetic relationships and areal groupings. Specific languages and families are selected for more detailed discussion, illustrating questions of relevance to linguistic theory and analysis, sociolinguistics, and applied linguistics.

**147. Classical Languages (4)**

An investigation of the phonology, morphology, and syntax of Sanskrit, classical Greek, or Latin. Reading and translation of selected texts. May be repeated for credit when topics vary.

**150. Historical Linguistics (4)**

Introduction to the concepts and methodology of historical linguistics. Topics covered include the nature of language change, genetic and areal relationships, the comparative method, and internal reconstruction.

**151. Language History (4)**

Examination of the historical development of one language or a group of related languages. Languages and language families likely to be considered include Austronesian, Chinese, Indo-European, Japanese, Uto-Aztecan, Yuman, and others. Because its subject matter varies, this course may be repeated for credit.

**154. History of English (4)**

General trends in the historical development of the English language, its sounds and its grammar.

**160. Formal Linguistics (4)**

Mathematical foundations of the formal syntax of natural languages. Introduction to the theory of formal languages, in particular context-free languages, and its relation to automata theory.

**163. Computational Linguistics (4)**

Topics variable, and may include: parsing theory, computational models of grammar; software tools for language analysis; UNIX operating system; SNOBOL4 and Lisp programming languages. May be repeated for credit when topics vary.

**170. Psycholinguistics (4)**

The study of models of language and of language acquisition from the point of view of modern linguistics and psychology. Basic experimental method as applied to language.

**172. Language and the Brain (4)**

Basic neuroanatomical and neuropsychological aspects of normal and abnormal language. Cerebral lateralization of language. Aphasia and dyslexia. Animal communication.

**175. Sociolinguistics (4)**

The study of language in its social context, with emphasis on the different types of linguistic variation and the principles underlying them. Dialects; registers; sex-based linguistic differences; factors influencing linguistic choice; formal models of variation; variation and change.

**177. Theories and Methods of Foreign Language Acquisition (4)**

This course will examine linguistic, psychological, and pedagogical arguments that underlie various language teaching programs.

**182. Linguistics and Poetics (4)**

Formal poetics, a linguistic approach to various forms of literature. Fundamentals of linguistics will be related to various current theories of literature. Special attention will be given to structuralist analyses of literature including those by Jakobson and the generative grammarians.

**184. Orthography (4)**

The development and structure of writing systems. The relation between the orthography of a language and its phonology and morphology.

**195. Apprentice Teaching (0-4)**

Students will lead a class section of a lower-division linguistics course. They will also attend a weekly meeting on teaching methods. (This course does not count toward minor or major.) May be repeated for credit, up to a maximum of four units. *Prerequisites: consent of instructor, advanced standing.*

**198. Directed Group Study in Linguistics (2 or 4)**

Study of specific language structures or linguistic topics not covered in regular course work, under the direction of an undergraduate major adviser in the linguistics department.

(P/NP grades only.) *Prerequisite: consent of instructor.* May be repeated for credit.

**199. Independent Study in Linguistics (2 or 4)**

The student will undertake a program of research or advanced reading in linguistics under the supervision of a faculty member of the linguistics department. (P/NP grades only.) *Prerequisite: consent of instructor.* May be repeated for credit.

**199H. Honors Independent Study in Linguistics (4)**

The student will undertake a program of research and advanced reading in linguistics under the supervision of a faculty member in the Department of Linguistics. (P/NP grades only.) *Prerequisite: admission to Honors Program.*

## Graduate

NOTE: Unless otherwise specified, the following graduate courses may be taken on a Satisfactory/Unsatisfactory (S/U) basis.

**210. Phonetics (4)**

Anatomy and physiology of the mechanisms used in speech. Acoustic phonetics. Speech perception. Additional topics such as neurolinguistics, acquisition, distinctive feature theory, phonetic explanation in phonology. Practice in transcription and production of the international Phonetic Alphabet.

**211A-B. Phonology (4-4)**

Introduction to theoretical concepts, methods of analysis, and descriptive apparatus. Current theoretical approaches and issues, illustrated by selected topics.

**214. Topics in Phonetics (4)**

Advanced topics in phonetic sciences. Subjects will vary, and may include speech perception, acoustic phonetics, neurolinguistics. Laboratory techniques and computer tools in these areas will be covered. May be repeated for credit when topics vary.

**215. Topics in Phonology (4)**

Selected research topics. Discussion of work in progress and/or survey of current literature.

**221A-B. Syntax (4-4)**

Introduction to generative syntax. Formulation and testing of grammar fragments for English and of general principles of grammar. This course concentrates on the syntactic constructions, the major hypotheses, and the argumentation techniques that have played a major role in the development of generative grammar.

**223A-B. Grammar and Cognition (4-4)**

Language in the context of the study of human cognition. Examination of the relation between meaning and grammatical form. The interaction of lexicon, morphology, and syntax and their contribution to the structuring and expression of conceptual content.

**224. English Syntax (4)**

A survey of the principal syntactic constructions of English and their standard transformational treatment. Complementation; extraction constructions, including constituent questions, relative clauses, comparatives; coordination; gapping and other deletion phenomena; the auxiliary.

**225. Topics in Syntax (4)**

Descriptive and theoretical problems in the analysis of English and other languages. Emphasis on the theoretical consequences of alternative analyses. Since the contents of this course will change, it may be repeated for credit.

**226A-B. Universal Grammar (4-4)**

The problem of constructing an adequate theory of grammar that makes explicit the ways grammars of human languages are alike and the ways they differ. Linguistic universals and the limits on variation they impose. Cross-linguistically viable characterizations of syntactic constructions and syntactic typology. Data is drawn from a variety of languages.

**227. Comparative Grammatical Structures (4)**

The purpose of this course is to combine the intensive study of a single language with a cross-linguistic perspective. The course focuses on selected phenomena in the grammar of one language, comparing them with analogous phenomena in other languages. Emphasis is placed on the ways data from other languages contribute to an understanding of the language under intensive study, and the contributions of that

language to an understanding of linguistic universals and language differences. Since the language chosen for intensive study will vary from year to year, the course may be repeated for credit.

**229. Recent Approaches to Syntax (4)**

Recent theoretical proposals will be examined critically and confronted with relevant data. Since the subject matter will change, this course may be repeated for credit.

**230. Semantics (4)**

Theories of semantic structure. The relation of meaning to grammar, and how it is to be accommodated in an overall model of linguistic organization. The application of formal semantics to the description of natural language.

**235. Topics in Semantics (4)**

Advanced material in special areas of the study of meaning and its relation to formal aspects of human language. As subject matter varies, the course may be repeated for credit.

**238. Lexicography (4)**

Principles and methods of lexicography. Topics may include: history of dictionary making, purposes of lexical collections, types of dictionaries, computer implementations.

**240A-B. Field Methods (4-4)**

The techniques of discovering the structure of a language through elicitation of data from native consultants under simulated field conditions. The first quarter typically focuses on phonetics/phonology, the second on syntax/semantics. May be taken for a letter grade only.

**241. Language Structures (4)**

Detailed investigation of the structure of one or more languages. Languages and language families likely to be examined include Albanian, Austronesian, Chinese, Germanic, Japanese, Old Icelandic, Romance, Samoan, Slavic, Uto-Aztecan, Yuman, and others. Because the subject matter varies from quarter to quarter, this course may be repeated for credit.

**242. Language Typology (4)**

The systematic ways in which languages differ. Examination of existing classificatory models and criteria for their evaluation as well as for the construction of viable alternatives. Specific topics may include word order, agreement, case, switch reference, reflexives, voice, evidentials, phonological systems and rule types, accentual systems, etc. Since the topics will vary from year to year, this course may be repeated for credit.

**243. Romance Linguistics (4)**

Topics concerning the history or structure of the Romance languages. Investigation of particular semantic, syntactic, morphological, or phonological processes in one or more of these languages. Languages to be investigated include French, Spanish, Portuguese, and Italian. May be repeated for credit as topics vary.

**245. Topics in American Indian Linguistics (4)**

Subjects covered may include: the genetic classification of American Indian languages; the structure of individual languages; change and reconstruction, areal relationships; survey of individual language families. Since the topic can change from year to year, course may be repeated for credit.

**248. Morphology (4)**

Theories of word structure will be examined critically and confronted with data from a variety of languages. The problems studied will vary from year to year. They may include issues such as the distinction between derivational and inflectional morphology, the interface between morphology and phonology, and the interface between morphology and syntax.

**249. Topics in Sign Languages of the Deaf (4)**

The structure of American Sign Language and other gestural languages of the deaf. Perception of language in the visual mode. Since the topic can change from year to year, course may be repeated for credit.

**250. Historical Linguistics (4)**

Introduction to the concepts and methodology of historical linguistics. Topics covered include the nature of language change, genetic and areal relationships, the comparative method, and internal reconstruction.

**251. Language History (4)**

Examination of the historical development of one language



## LITERATURE

or a group of related languages. Languages and language families likely to be considered include Austronesian, Chinese, Indo-European, Japanese, Uto-Aztecan, Yuman, and others. Because its subject matter varies, this course may be repeated for credit.

### 255. Topics in Historical Linguistics (4)

Advanced or specialized problems in the analysis of language change and inter-language relationships. Issues in the theory of language change and its implications for synchronic theory and description.

### 260. Formal Linguistics (4)

Theory of formal grammars, with particular emphasis on context/free grammars. Aspects of theories of automata and computation related to grammatical systems. Relationship of the hierarchies of automata and grammars.

### 263. Computational Linguistics (4)

Topics variable, and may include: parsing theory; computational models of grammar; software tools for language analysis; UNIX operating system; SNOBOL4 and Lisp programming languages. May be repeated for credit when topics vary.

### 265. Topics in Formal Linguistics (4)

Advanced material in special areas of the study of formal grammars to be selected by the instructor. May be repeated for credit. *Prerequisite: Linguistics 260 or consent of instructor.*

### 270. Psycholinguistics (4)

The study of models of language and of language acquisition from the point of view of modern linguistics and psychology.

### 272. Language and the Brain (4)

Basic neuroanatomical and neuropsychologic aspects of normal and abnormal language. Cerebral lateralization of language. Aphasia and dyslexia. Animal communication.

### 277A-B. Research in Foreign Language Acquisition (4-4)

Investigation of methods of teaching foreign languages and the theories of language acquisition on which they are based.

### 286. Philosophy of Language (4)

Examination of some current philosophical and scientific views on the nature, use, and acquisition of natural languages. May be repeated for credit, as course content may vary.

### 288. Topics in the History of Linguistics (4)

Salient features in the development of the various aspects of linguistic theory will be surveyed, and the contributions of principal schools, such as the neogrammarian, Prague, structuralist traditions, will be assessed. Since the topic can change from year to year, course may be repeated for credit.

### 290. Current Issues in Linguistic Theory (4)

Discussion of selected current issues: theoretical formulations, their predictions, and how relevant data can be brought to bear on them. Since the topics will change, this course may be repeated for credit.

### 292. Current Research (4)

Discussion and evaluation of specific proposals bearing on linguistic theory.

### 294. Topics in Research in Progress (0)

Presentation and discussion of faculty and student research currently in progress. (S/U grades only)

### 295. Topics in Research in Progress (0)

Presentation and discussion of research currently in progress at other universities and institutions. (S/U grades only)

### 296. Directed Research (1-8)

Individual research. May be repeated for credit.

### 297. Fieldwork (1-8)

Linguistic analysis of language in the field. May be repeated for credit.

### 299. Doctoral Research (1-12)

Directed research on dissertation topic for students who have been admitted to candidacy for the Ph.D. degree. May be repeated for credit. *Prerequisite: admission to candidacy.*

### 500. Apprentice Teaching of Language (1-4)

The course, designed for graduate students serving as lan-

guage assistants, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course.

### 501. Apprentice Teaching in TESOL (1-4)

The course, designed to meet the needs of graduate students who serve as TA's in the department's TESOL programs, includes analyses of texts and materials, discussion of teaching techniques and theories, conducting the discussion sections, preparation and grading of routine examinations, all under the supervision of the instructor assigned to the course. As a requirement for the M.A. with specialization in TESOL, a student must serve as an apprentice teacher for the equivalent of 50 percent time for one academic quarter. Enrollment in this course for a total of four units documents the fulfillment of this requirement. (S/U grades only.)

### 502. Apprentice Teaching of Linguistics (1-4)

The course, designed for graduate students serving as teaching assistants in the department's linguistics courses, includes discussion of teaching theories, techniques, and materials, conduct of discussion sessions, and participation in examinations, under the supervision of the instructor in charge of the course. The student must be serving as a teaching assistant in a Ling/Gen course to receive credit.

## LITERATURE

UNDERGRADUATE PROGRAM: 110  
Third College Humanities Building,  
Third College

GRADUATE PROGRAM: 104 Third  
College Humanities Building, Third  
College

ADMINISTRATIVE OFFICE: 115 Third  
College Humanities Building, Third  
College

### Professors:

- Ronald S. Berman, Ph.D. (*English Literature*)
- Carlos Blanco Aguinaga, Ph.D. (*Spanish Literature*)
- Diego Catalan, Ph.D. (*Spanish Literature*)
- Jaime Concha, Ph.D. (*Spanish and Latin American Literature*)
- Charles Cooper, Ph.D. (*Writing, Coordinator, College Writing Programs*)
- †Abraham J. Dijkstra, Ph.D. (*American and Comparative Literature*)
- Page duBois, Ph.D. (*Classics*)
- Edwin S. Fussell, Ph.D. (*English and American Literature, Writing*)
- †Reinhard Lettau, Ph.D. (*German Literature*)
- James K. Lyon, Ph.D. (*German Literature, Provost of Fifth College*)
- Masao Miyoshi, Ph.D. (*English and Comparative Literature, Hajime Mori Endowed Chair*)
- Louis Adrian Montrose, Ph.D. (*English and American Literature*)
- Roy Harvey Pearce, Ph.D. (*American Literature, Director of Graduate Studies*)

John L. Stewart, Ph.D. (*American Literature, Provost of John Muir College*)

- Richard Terdiman, Ph.D. (*French Literature*)
- Patricia Terry, Ph.D. (*Adjunct Professor of French and Comparative Literature*)
- Donald T. Wesling, Ph.D. (*English Literature, Chairman*)
- Martin W. Wierschin, Ph.D. (*German Literature and Germanic Philology*)
- Sherley Anne Williams, M.A. (*American and Afro-American Literature*)
- †Andrew Wright, Ph.D., F.R.S.L. (*English Literature*)
- Wai-Lim Yip, Ph.D. (*Chinese and Comparative Literature*)

### Associate Professors:

- Jack Behar, Ph.D. (*American Literature*)
- Steven Cassedy, Ph.D. (*Slavic and Comparative Literature*)
- Alain J.-J. Cohen, Ph.D. (*French and Comparative Literature*)
- Stephen Cox, Ph.D. (*English Literature, Director, Revelle Humanities Writing Program*)
- David K. Crowne, Ph.D. (*English and Comparative Literature*)
- †Michael Davidson, Ph.D. (*American Literature, Writing*)
- Thomas K. Dunseath, Ph.D. (*English Literature*)
- William Fitzgerald, Ph.D. (*Classics and Comparative Literature*)
- Richard Friedman, Th.D. (*Hebrew and Comparative Literature*)
- †Suzanne C. Gearhart, Ph.D. (*French Literature*)
- Susan Kirkpatrick, Ph.D. (*Spanish and Comparative Literature*)
- Fred V. Randel, Ph.D. (*English Literature*)
- Marta E. Sanchez, Ph.D. (*Latin American and Chicano Literature*)
- Rosaura A. Sanchez, Ph.D. (*Spanish Literature*)
- William S. Tay, Ph.D. (*Chinese and Comparative Literature*)
- Cynthia Walk, Ph.D. (*German Literature*)
- Don Edward Wayne, Ph.D. (*English Literature*)

### Assistant Professors:

- Robert Cancel, Ph.D. (*African and Comparative Literature*)
- William Fitzgerald, Ph.D. (*Classics and Comparative Literature*)
- Stephanie Jed, Ph.D. (*Italian and Comparative Literature*)
- †Aralia Lopez-Gonzalez, Ph.D. (*Mexican Literature*)

Catherine Lowe, Ph.D. (*French Literature*)

Lisa Lowe, Ph.D. (*Comparative Literature*)

George Mariscal, Ph.D. (*Spanish Literature*)

William A. O'Brien, Ph.D. (*German and Comparative Literature*)

•Kathryn Shevelov, Ph.D. (*English and American Literature*)

Jon Snyder, Ph.D. (*Italian and Comparative Literature*)

Barbara Tomlinson, Ph.D. (*Writing, Director, Muir College Writing Program*)

\*On leave 1987-88

†On leave fall quarter

-On leave winter quarter

•On leave spring quarter

\* \* \*

All literature courses at UCSD are offered by a single Department of Literature. The department brings together teacher-scholars and students who would elsewhere be separated by the languages in which the national literatures are written. Here, they are united by the nature of the studies they pursue. This lends a comparatist aspect to both undergraduate and graduate programs, which lead to the bachelor of arts, master of arts, the candidate in philosophy, and doctor of philosophy degrees. All students must show knowledge of a foreign literature by doing upper-division or graduate work in that literature in the original language. Courses are offered not only in the literatures themselves but in the theoretical aspects of literature and — often in cooperation with other departments — in the relationship of literary study to other disciplines such as philosophy, visual arts, music, sociology, history, psychology, linguistics, and communications. With special permission, undergraduates may take graduate courses for credit, and graduate students may also take undergraduate courses for credit.

## The Undergraduate Program

### Lower-Division Preparation

Lower-division requirements vary, depending on the literature program in which the student elects to concentrate. However, the department strongly recommends that, as part of the freshman/sophomore college requirements, students who have chosen or are considering a major in literature take the appropriate lower-division language sequence in linguistics and literature as preparation for

upper-division course work in a foreign language and literature.

### Writing in Literature Courses

It is the departmental expectation that in courses where English is the primary language, students in lower-division courses should write a minimum of 2,500 words per course; in upper-division courses the minimum requirement is 4,000 words per course.

## THE MAJOR IN LITERATURE

Six programs are open to those majoring in literature: English-American, French, General Literature, German, Spanish, and Writing. In each case, whatever the primary field of concentration, a student is expected to study a second literature. The range of second literatures includes Chinese, Classical Greek, Hebrew, Italian, Latin, and Russian, as well as the previously mentioned French, German, Spanish, and for those concentrating in a foreign literature, English-American. Once a student has decided upon a major in literature, he or she is required to plan each quarter's program together with an adviser in the Department of Literature.

A major consists of:

1. The Primary Literature: nine upper-division courses in one literature (except in general literature and writing majors, which are structured differently). See individual program requirements below on the various areas of concentration.
2. The Secondary Literature: three courses in a second literature, given substantially in the native language. At least one of these courses must be upper-division, except French where two upper-division courses are required and one quarter of French 50 may be applied. In German, Italian and Spanish, two courses may be lower-division provided that they come from courses numbered 50 through 54. The following lower-division courses are also applicable: English 21-22-23-24 and 50; Greek 2 and 3; Latin 2 and 3; Hebrew 2 and 3 (see Judaic Studies). General literature courses may not be applied toward the English secondary literature requirement.
3. A total of at least twelve upper-division Department of Literature courses altogether.

All regularly scheduled departmental courses taken to satisfy the requirements of the literature major, including courses in the secondary literature, must be taken for a letter grade. No grade below C is acceptable toward any course taken in the major.

Students majoring in literature must take at UCSD a minimum of six upper-division courses in the major, including at least four in the primary literature and at least one in the secondary literature.

Study abroad toward the major should be done *prior* to the senior year.

The department also offers the opportunity of interdepartmental majors under the Muir College Special Projects.

### Honors Program

The department offers a special program of advanced study for outstanding undergraduates majoring in literature. Admission to this program ordinarily requires an overall GPA of 3.5 and a literature major GPA of 3.7 at the end of spring quarter of junior year. Students meeting these requirements will be sent, early the following fall, an invitation to participate in the program. In unusual cases, admission may also be granted to a senior who, though not meeting the GPA requirements, has submitted to the Literature Honors Committee by the end of the third week of fall quarter a petition for admission supported by three recommendations from members of the literature faculty. During the winter quarter of their senior year, all honors students together take an honors seminar (Lit/Gen 191), which aims to deepen their understanding of the issues of theory and method implied in the study of literature. At this time, they lay the groundwork for their honors thesis, which they write in spring quarter (Lit 196), each under the supervision of a faculty member who specializes in the literature of the student's primary concentration. The Honors Program concludes with an oral examination of each honors candidate by a faculty committee, which is charged with recommending whether departmental honors are warranted and, if so, which degree of honors — "with distinction," "with high distinction," or "with highest distinction" — will appear on the student's transcript and diploma. A student from this program will also be recommended for the Burckhardt Prize, which is awarded at graduation for outstanding achievement in the literature major. The honors seminar and Lit 196 may be applied toward the primary concentration in the literature major.

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### Special Studies

Special Studies (the 199's) may be taken only by students whose departmental GPA is at least 3.0. Students not satisfying this requirement may, with detailed justification by the instructor concerned, petition for an exception to the regulation. At least 4,000 words of writing — or what is in the judgment of the instructor its equivalent — is required in 199's.

### INDIVIDUAL PROGRAM REQUIREMENTS

#### Primary Concentration in English and American Literature

1. Lit/English 21, 22, 23, and 24. Even if some or all of these courses are used toward meeting a college's humanities or general-education requirements, they still count toward meeting the requirements for the English and American literature major.
2. Nine upper-division courses in English and American literature, including at least one course from each of the following five categories:
  - a. English literature before 1640
  - b. English literature from 1640 to 1800
  - c. English literature from 1800 to the present
  - d. American literature before 1860
  - e. American literature after 1860
3. Three courses, of which at least one must be upper-division (except French where two upper-division courses are required), in a second literature, given substantially in a language other than English. See the heading, "The Secondary Literature," above, for detailed information on which lower-division courses may be used toward meeting this requirement.
4. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

#### Primary Concentration in a Foreign Literature

##### French Literature

1. Nine upper-division courses as follows:
  - a. Lit/Fr 110A-B-C. Themes in French Intellectual and Literary History
  - b. Six additional upper-division courses in French literature
2. Three courses in a second literature. At least one of these must be an upper-division course. See the head-

ing, "The Secondary Literature," above, for detailed information on which lower-division courses may be used toward meeting this requirement.

3. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

##### German Literature

1. Nine upper-division courses in German literature.
2. Three courses in a second literature. At least one of these must be an upper-division course, except French where two upper-division courses are required. See the heading, "The Secondary Literature," above, for detailed information on which lower-division courses may be used toward meeting this requirement.
3. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

##### Spanish and Latin American Literature

1. Nine upper-division courses as follows:
  - a. Lit/Sp 130A. Development of Spanish Literature
  - b. Lit/Sp 130B. Development of Latin American Literature
  - c. Lit/Sp 119. Cervantes
  - d. Six additional upper-division courses in Spanish, Latin American, and/or Chicano literature.
2. Three courses in a second literature. At least one of these must be an upper-division course, except French where two upper-division courses are required. See the heading, "The Secondary Literature," above, for detailed information on which lower-division courses may be used toward meeting this requirement.
3. Upper-division electives from Department of Literature offerings, whether in Spanish or in another literature, to make a total of twelve upper-division courses.

Students majoring in Spanish can choose to concentrate on either Spanish or Latin American literature. All students, however, are encouraged to take courses in the various national literatures as well as Chicano literature for a broad background in Spanish language literatures.

Students not having a solid linguistic base in Spanish are advised to take inter-

mediate language classes (Lit/Sp 10, 25, and 50) for additional review of Spanish grammar, further development of writing skills, and introduction to literary analysis. These lower-division courses, however, do not count towards the major.

#### Primary Concentration in General Literature

The purpose of the general literature major is to give students experience with the various modes of organizing literary study, without the exclusive concentration in a national literature characteristic of the previously described literature programs.

1. Group A: Four upper-division courses in a single national literature — that is, literature originally written in a single language, such as Russian, German, English, or a regional literature (current offerings: Africa, Latin America, and East Asia). These courses may treat the literature in the original language, or in translation, or in a combination of the two.
2. Group B: Four additional upper-division courses about a period, a genre, or a topic in literary study. Some examples: literature of the ancient world, the novel, poetry, and women's literature. The courses taken to satisfy the requirement in Group A cannot at the same time be applied to Group B (and vice versa).
3. Group C: Any four more upper-division courses in Third World literature (Africa, Asia, and Latin America). Students who have satisfied this requirement in Group A or Group B may take four upper-division courses from any of the departmental offerings.
4. Three courses, of which at least one must be upper-division (except French where two upper-division courses are required), in a foreign literature, given in a language other than English. See the heading, "The Secondary Literature," above, for detailed information on which lower-division courses may be used toward meeting this requirement. The required upper-division course given in a foreign language, which is used to satisfy the requirement, may — where appropriate — be applied to Group A, Group B, or Group C.
5. One course in writing may be applied to Group B, if the subject of the writing course is centrally related to the Group B topic. For example, if the topic chosen for Group B is poetry, a course in

the writing of poetry could be one of the four courses offered to satisfy the requirement. No more than a total of two courses in writing may be taken as part of the general literature major.

6. At least two of the required twelve upper-division courses must be in "pre-modern" literature.

### Primary Concentration in Writing

The writing major is designed to provide directed experience in writing prose fiction and nonfiction, drama and poetry, as well as intensive work in practical criticism. An indispensable feature of the program is that it involves students with the work of their peers. Those who think of themselves as writers will find courses regularly offered in the various genres to develop their own style and breadth of experience in composing and criticism. Those who are primarily interested in the teaching of writing will find the major a context both for writing extensively and for dealing critically with the act of written composition. Note that both lower- and upper-division requirements for the writing major differ from those for other primary concentrations in the Department of Literature. The major requirements are as follows:

1. Any of the following literature sequences:
  - a. Lit/Gen 4A-B-C-D-E-F — any three courses in the sequence (Fiction and Film in Twentieth-Century Societies)
  - b. Lit/Gen 6A-B-C (Understanding Literature)
  - c. Lit/Gen 19A-B-C (Introduction to the Ancient Greeks and Romans)
  - d. Lit/En 21, 22, and either 23 or 24 (The English and American Literary Imagination)
  - e. TWS 21, 22, 23 (Third World Literatures)
2. Two courses from any of these three alternatives:
  - a. Any two courses from the sequence Lit/Writing 140-145.
  - b. One course from the sequence Lit/Writing 140-145 and one upper- or lower-division studio course in another art. (Courses like Visual Arts 1, 2, or 3 and Theatre 12 are appropriate.) This studio art course must have the approval of the student's adviser in the writing major. The adviser must also sign for the student an Undergraduate Student Petition form requesting that the

particular studio art course be applied toward requirements in the writing major.

- c. One upper- or lower-division studio course in another art as described above in 2b, and one lower-division writing course from the sequence of courses Lit/Writing 11-18.
3. Twelve upper-division courses:
    - a. Six upper-division courses in Lit/Writing from the writing workshop sequences 100-127. These workshops may be repeated for credit (see course listing for number of times workshops may be repeated), but the requirement should show a range of writing experience in at least two major writing types. No other courses may be substituted for this basic requirement of six upper-division workshops.
    - b. Six upper-division electives chosen from Department of Literature offerings; at least four of these courses must be outside the Lit/Writing sequence.
  4. Three Department of Literature courses given in a language other than English. At least one of these three must be upper-division (except French where two must be upper-division), and may be applied toward the total of twelve upper-division courses in the major. See the heading "The Secondary Literature," above, for detailed information on which lower-division courses may be used to meet this foreign literature requirement.

Certain courses are recommended particularly for writing majors with an interest in studying the writing process itself, the wide range of forms of written language, or the teaching of writing. Some of these courses are grouped under the heading Writing Process, Written Discourse, and Writing Pedagogy (courses numbered 140-145). Also appropriate are Lit/Spanish 164 (Language and Society) and Lit/Spanish 163 (Spanish Language in America), which deal with the sociolinguistic aspects of writing.

### Double Major in Writing and a Subject outside Literature

Students who wish to major both in writing and in some department other than the Department of Literature are required to complete nine upper-division courses for the writing major as follows:

1. Six upper-division workshops

2. Three upper-division literature courses.

All other requirements of the major must be met. This includes the lower-division sequence requirement, two courses from any of the three alternatives listed in the writing major, and the second literature requirement. The upper-division course used to complete the second literature requirement may be applied toward the total of nine upper-division courses.

### Double Major within the Department of Literature in Writing and Literature

Students who wish to major both in writing and in literature (any section) are required to complete nine upper-division courses for the writing major as follows:

1. Six upper-division writing workshops
2. Three upper-division literature courses.

All other requirements of the writing major must be met. This includes the lower-division sequence requirement, two courses from any of the three alternatives listed in the writing major, and the second literature requirement. The upper-division course used to complete the second literature requirement may be applied toward the total of nine upper-division courses. Students may simultaneously meet the language requirements for both majors, writing and literature, but only one upper-division course in the second literature may overlap in the double major.

### THE MINOR IN LITERATURE

The department offers a wide range of possibilities for noncontiguous minors. The options include courses in a single national literature, courses in more than one literature, and a combination of language and literature courses. In all instances, the minors require six courses; at least three of the courses must be upper-division. The three upper-division courses must be taken at UCSD. All courses taken to complete a literature minor must be taken for a letter grade. No grade below C is acceptable toward any course in the minor. Lower-division courses that are applicable toward the individual minors are listed below. In the case of Chinese, Classical Greek, Hebrew, Italian, Latin and Russian, two of the courses may be tutorials. Students should consult a departmental adviser.

Lower-division courses applicable toward minors:



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English/American — Lit/En 21, 22, 23, 24, 50

French — Lit/Fr 10, 25, 50

German — Lit/Ge 15, 25, 51, 52, 53

Greek — Lit/Gk 1, 2, 3

Hebrew — Hebrew 1,2,3 (see Judaic Studies)

Italian — Lit/It 50, 51

Latin — Lit/La 1, 2, 3

Spanish — Lit/Sp 10, 25, 50

General Minor — Any six literature courses. There must be three upper-division courses. No more than two courses in writing may be applied toward the general minor.

Writing Minor — The writing minor is a flexible program open to students in all academic departments. Students interested in writing fiction may focus their work in the poetry or prose fiction courses. Students interested in informational writing of various types or in research writing may focus their work in a wide range of nonfictional prose offerings.

The requirements of the writing minor are six courses chosen from Lit/Writing 11-18, 100-127. At least three of the courses must be upper-division. These courses must be in at least two major types of writing. Lit/Writing 140-145 or 195 may constitute two of the courses for the minor.

## The Graduate Program

### DOCTORAL DEGREE PROGRAM

Doctoral programs are offered in English and American literature, French literature, German literature, Spanish literature, and comparative literature. Students in the doctoral program may qualify for the M.A. under Plan 1 (modified thesis plan). (See "Graduate Studies: The Master's Degree.") The C. Phil. degree is conferred upon all students advanced to candidacy for the Ph.D.

### Preparation

The following are requirements for admission to graduate study in literature:

1. A baccalaureate degree with a major in one of the literatures offered by the department, or in another field approved by the departmental committee on graduate studies
2. Satisfactory scores on the Graduate Record Examination, including the advanced examination in the literature of the student's field
3. A complementary working knowledge of a second literature and its language.

### Course of Study

Although most students will choose to concentrate in a national literature, there will necessarily be a distinctly comparatist emphasis in their studies. Each student will undertake a comparatist project — course work and guided independent study in a literature other than, but related to, the one in which he or she is specializing. The program of study makes explicit provision for a significant amount of independent work. Tutorial work and interdisciplinary study are encouraged; in addition, all graduate students work in close association with an adviser who directs their independent study preparatory to the qualifying examination. Few specific courses are required. On the contrary, graduate students take those seminars best suited to their individual needs and interests. Students are required to enroll in a minimum of twelve seminars, or their equivalent, during the first six quarters of graduate study, and receive credit for their participation on a satisfactory/unsatisfactory basis. Students who have received an M.A. or its equivalent elsewhere may receive transfer credit for up to three seminars. While completing the twelve-seminar requirement, students are expected to write six term papers at the rate of one per quarter.

### Specialty in Composition Theory and Research

In keeping with the theoretical interdisciplinary tradition in the department, doctoral students in English and American literature may pursue special studies in composition theory and research. These studies do not constitute a separate degree program, but rather a subspecialty within the Ph.D. program in English and American literature. Within the department, students in composition theory have access to a diversified faculty in several national literatures with a variety of approaches to textual analysis, including structuralism and semiotics. Within the department, courses are available in the social and psychological aspects of literature, the pragmatics of the author/reader relationship, and the relations between oral and written discourse. And there are relevant courses in the Departments of Linguistics, Psychology, and Communication. In addition, upper-division undergraduate courses are available on the writing process, forms of written discourse, stylistics, and the teaching of writing. At the graduate level there are research and pedagogy courses and

courses in the history of rhetoric. Independent study and guided research are available with faculty who work directly in this subspecialty. Only students with a strong interest in theory and research should consider the subspecialty in composition studies. They will be joining an active, research-oriented group of faculty and doctoral students. Students may teach in one of the four college freshman writing programs, and learn first-hand what is involved in the administration and evaluation of college or university writing programs.

### Language Requirements

Graduate students in literature are required to develop the ability to read literary and secondary texts and to follow seminar discussions or lectures in a second language, a language other than the one in which the literature of their primary specialization is written. Each student must demonstrate language proficiency through regular enrollment in and completion of a seminar in the literature of the second language, or, in exceptional cases, by completing with the grade of A an upper-division course given entirely in the language.

The Ph.D. program in German literature requires that a student who concentrates research in a period before 1700 know or learn Latin. Each student will be required to take a two-course sequence consisting of a cultural history of the German language and an introduction to Middle High German. Equivalent work done elsewhere will be counted toward a fulfillment of the requirement.

The Ph.D. program in comparative literature requires knowledge in depth of two foreign languages. "Knowledge in depth" means the ability to attend graduate seminars given in the original language (or, in the case of classical and non-Western languages, seminars where the texts are read in the original language). This ability must be demonstrated by enrolling in such seminars or, where this is not possible, by taking guided independent study in the language in question. Reading ability in French, German, Italian, or Spanish is strongly recommended where these languages are not included among the student's two principal foreign languages.

The M.A. program in comparative literature requires knowledge in depth of one foreign language.

### Advancement to Candidacy

As students participate in seminars they are encouraged to move toward the sec-



ond stage of their preparation for advancement to candidacy. During this stage, students in consultation with their advisers choose three areas of specialization: (1) a literary or critical genre or mode; (2) an historical period; (3) an author of major significance within the national literature of the student's primary focus. A problem of critical theory or interdisciplinary study may be substituted for one of the three. The areas should not overlap.

Students choose one of the three areas of specialization to be the subject of the Long Paper, which forms the main focus of preparation for candidacy. Prepared in consultation with appropriate faculty members, the Long Paper is a piece of scholarly research or theoretical analysis demonstrating intellectual and analytical acumen. In addition to the Long Paper, two research reports representing the other areas of specialization are required. These are expected to demonstrate a command of scholarship as such. The reports and the Long Paper are accompanied by a critical and selective, but comprehensive bibliography of primary and secondary source materials. In either the Long Paper or one of the research reports there must be a comparatist component representing research into the subject beyond the boundaries of the national literature of primary specialization. When these papers are deemed acceptable, a two-hour oral doctoral examination takes place centering on, but not limited to, the subjects of the papers.

Beyond the Long Paper there is an alternative way to proceed. The student may choose to be examined in the other two areas in two three-hour examinations. Afterwards comes the two-hour oral examination, as above. On passing the examination, the student is declared eligible for advancement to candidacy for the Ph.D. The C. Phil. degree is conferred on those so advanced. Thereupon, a doctoral dissertation — often incorporating the Long Paper — is written. This work is defended in a traditional final examination.

### Teaching

The department requires that each Ph.D. student do some apprentice teaching before the completion of the degree; the minimum amount required is equivalent to the duties expected of a half-time teaching assistant for three academic quarters. This teaching involves conducting discussion sections and related activities in a variety of freshman and sophomore courses, with the guidance and

support of a supervising professor. Academic credit is granted for the training given under the apprentice teaching program.

### MASTER'S DEGREE PROGRAM

The Master's Degree Program is intended to meet the needs of two groups: (1) Those who are admitted to the graduate program with the aim of proceeding to the master's degree only; and (2) Full-time graduate students who are admitted to graduate study with the aim of proceeding to the Ph.D. and who decide to qualify for a master's degree. The M.A. degree is currently available in five fields: English/American, French, German, Spanish, and comparative literature. It is possible to take an M.A. in Spanish with a special emphasis on bilingual discourse, or an M.A. in English with a special emphasis on composition theory. The department does not offer financial support for M.A. candidates.

Students may enter the M.A. program in fall, winter, or spring quarter. Completed applications and supporting materials must be received at least four weeks before the beginning of the quarter in which the applicant proposes to begin study. Those planning to apply should take the Graduate Record Examination, including the advanced examination in the literature of the student's field, far enough in advance so that the scores will be available to the admissions committee.

The requirements for the M.A. degree are a total of thirty-six units. Included must be the following:

1. Twenty units of graduate seminars, in the context of which at least three seminar papers must be written. For students in the comparative literature section, one of these papers must demonstrate knowledge of a language other than that of the student's principal concentration.
2. Eight additional units of graduate seminars, upper-division courses, and/or guided independent study, in the context of which at least one further paper must be written. Up to four units of supervised teaching at UCSD may be applied toward this eight-unit requirement.
3. Four units of literature written in a language other than that of the student's principal concentration. This course may be taken either in the original language or in translation, and it may be used toward fulfilling the requirements listed under items 1 or 2 above. An

upper-division or graduate course in English or American literature may be used to fulfill this requirement by students working toward an M.A. degree in French, German, or Spanish. An upper-division course in general literature may be taken to satisfy this requirement so long as its principal readings were originally written in a language other than that of the student's principal concentration. Students in the comparative literature section must take a four-unit seminar conducted in a language other than that of the student's principal concentration or, for ancient and oriental languages, an upper-division course where the texts are read in the original language.

4. Eight units of guided research, culminating in an acceptable master's thesis or master's examination.

### Research Resources

The UCSD Library's Mandeville Department of Special Collections offers the undergraduate and graduate literature student an excellent range of resources, including single-author collections, rare and out-of-print books, tapes, maps and historical archives. Of special interest are the Southworth Collection of Spanish Civil War materials, the Hill Collection of South Pacific Voyages, the Don Cameron Allen Renaissance collection, and the Archive for New Poetry. Within the latter collection are an extensive series of single-author archives, including the papers of Paul Blackburn, Donald Allen (the editor and publisher), Lew Welch, Charles Reznikoff, Joanne Kyger, Jerome Rothenberg, and others. The Archive for New Poetry is one of the largest collections of contemporary poetry in the United States. Students also have access, facilitated by travel grants, to all other University of California research collections.

### Courses

**NOTE: A LIST OF SPECIFIC COURSE OFFERINGS (WITH NAMES OF INSTRUCTORS FOR THE 1987-88 ACADEMIC YEAR) IS AVAILABLE IN THE UNDERGRADUATE OFFICE OF THE DEPARTMENT OF LITERATURE.**

**LOWER-DIVISION STUDENTS ARE ENCOURAGED TO ENROLL IN CERTAIN UPPER-DIVISION COURSES OFFERED BY THE DEPARTMENT OF LITERATURE. INTERESTED LOWER-DIVISION STUDENTS SHOULD CONTACT THE DEPARTMENT OF LITERATURE UNDERGRADUATE OFFICE FOR ADVICE AS TO WHICH COURSES WOULD BE MOST SUITABLE TO THEIR INTERESTS AND ABILITIES.**

**UNDERGRADUATE STUDENTS MAY ENROLL IN GRADUATE SEMINARS WITH THE CONSENT OF INSTRUCTOR AND MAY RECEIVE A LETTER GRADE OR P/NP GRADE.**

## LITERATURE

### CHINESE LITERATURE

#### Upper Division

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

#### **Lit/Ch 101. Readings in Contemporary Chinese Literature (4)**

Intended for students who have the competence to read contemporary Chinese texts, poetry, short stories, and criticism in vernacular Chinese. May be repeated for credit as topics vary.

#### **Lit/Ch 120. Readings in Classical Chinese Poetry (4)**

This course is designed to introduce the art of Chinese poetry through close readings of the texts. Selections range from Shih ching to Sung tz'u with particular emphasis on the high T'ang period. Students are required to read the texts in the original. *Prerequisite: two years of Chinese or equivalent.*

#### **Lit/Ch 150A. Classical Chinese Literature in Translation (4)**

The course will focus on a few representative masterpieces of Chinese literature in its classical age, with emphasis on the formal conventions and the social or intellectual presuppositions that are indispensable to their understanding. May be repeated for credit as topics vary.

#### **Lit/Ch 150B. Modern Chinese Literature in Translation (4)**

A survey of representative works of the modern period from 1919 to 1949. May be repeated for credit as topics vary.

#### **Lit/Ch 150C. Contemporary Chinese Literature in Translation (4)**

An introductory survey of representative texts produced after 1949 with particular emphasis on the social, cultural, and political changes. May be repeated for credit as topics vary.

#### **Lit/Ch 198. Directed Group Study (4)**

Directed group study in areas of Chinese literature not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

#### **Lit/Ch 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

### COMPARATIVE LITERATURE

#### Graduate

#### **Lit/Co 201A-B-C. Introduction to Critical Theory and the Comparative Study of Texts (4-4-4)**

A core course for comparative literature, required of all graduate students in the comparative literature program. The first course, 201A, is a pro-seminar in the history and methodology of comparative literature studies. The second course, 201B is an introduction to the general study of critical theory. The third course, 201C, is a practicum in a selected branch of modern critical theory (e.g., Russian formalism, French structuralism, Marxism). 201C may be repeated for credit as topics vary.

#### **Lit/Co 202A-B-C. History of Criticism and Aesthetics (4-4-4)**

A core course for comparative literature, strongly recommended for all graduate students in the comparative literature program. A historical survey of criticism and aesthetics divided as follows: 202A, Aristotle to Kant; 202B, Hegel to Valéry; 202C, Russian formalism to the present.

#### **Lit/Co 210. Classical Studies (4)**

Analysis of significant works of the Greek and Roman traditions, with attention to their interest for later European literature. May be repeated for credit as topics vary.

#### **Lit/Co 215. Medieval Studies (4)**

A study of styles and forms of narrative poetry in medieval English, French, German, and Latin. May be repeated for credit as topics vary.

#### **Lit/Co 221. Renaissance Studies (4)**

One or more major writers, texts, or trends of European Renaissance. May be repeated for credit as topics vary.

#### **Lit/Co 224. Seventeenth-Century Studies (4)**

One or more major writers, texts, or trends of seventeenth-century European literature. May be repeated for credit as topics vary.

#### **Lit/Co 231. Eighteenth-Century Studies (4)**

One or more major writers, texts, or trends of eighteenth-century European literature. May be repeated for credit as topics vary.

#### **Lit/Co 241. Romanticism (4)**

A study of the romantic movement in various national literatures. May be repeated for credit as topics vary.

#### **Lit/Co 242. Nineteenth-Century Studies (4)**

Consideration of one or more major figures, texts, trends, or problems in the nineteenth century. May be repeated for credit as topics vary.

#### **Lit/Co 243. Symbolism (4)**

A study of the poetic imagery and of the changes in symbolic and thematic significance from the eighteenth to the twentieth century. May be repeated for credit as topics vary.

#### **Lit/Co 252. Modernism (4)**

A sample investigation into the concept of period. The course will deal also with the question of the existence of modernism, the description of the phenomenon, and the causes to which it is to be attributed. May be repeated for credit as topics vary.

#### **Lit/Co 253. The New Literatures (4)**

A study of styles and forms of prose and poetry in various languages — the literature — being developed in "emerging nations." May be repeated for credit as topics vary.

#### **Lit/Co 261. Comparative Literature: History and Theory (4)**

An introduction to the intellectual origins, the tools of research, and the principal aims of comparative literature.

#### **Lit/Co 262. Comparative Poetics (4)**

The course will investigate "Common Poetics" on the basis of examples chosen from various literatures, including an oriental one, as well as the methodological problems that such investigation raises. May be repeated for credit as topics vary.

#### **Lit/Co 263. Theory and Practice of Translation (4)**

Designed to examine different theories of translation in order to arrive at a perspective from which an objective basis for the art of translation may be formed. May be repeated for credit as topics vary.

#### **Lit/Co 264. Oral Literature (4)**

An introduction, through the study of recordings of actual oral performance as well as of the written record, to research in oral literature and the theoretical and methodological problems entailed.

#### **Lit/Co 265. Theories of Conversation: Literary and Everyday (4)**

This seminar examines the relationship between literary and everyday discourse. It introduces basic assumptions in studies of social interaction, speech act theory, and the analysis of conversational materials. The application of recent models in sociolinguistics and the sociology of language to the study of literary texts will be explored.

#### **Lit/Co 271. Critical Theory (4)**

Problems of literary analysis; competing schools and major figures in literary criticism. May be repeated for credit as topics vary.

#### **Lit/Co 272. Literature and Social History (4)**

Special topics in practical criticism involving social and economic historical perspectives. May be repeated for credit as topics vary.

#### **Lit/Co 273. Art and Literature (4)**

An investigation into themes and styles common to literature and the visual arts. May be repeated for credit as topics vary.

#### **Lit/Co 274. Genre Studies (4)**

A consideration of a representative selection of works relating to a theme, form, or literary genre. May be repeated for credit as topics vary.

#### **Lit/Co 275. Literature and Music (4)**

A study of selected topics in the interrelationship of poetry, drama, and music. May be repeated for credit as topics vary.

#### **Lit/Co 276. The Modern Theatre (4)**

A study of plays and dramatic theory from the eighteenth century to the present. May be repeated for credit as topics vary.

#### **Lit/Co 277. Psychoanalytic Approaches to Literature (4)**

A systematic study of basic psychoanalytic theory as it applies to literary criticism, with practical psychoanalytical exploration of works from various periods and literatures. May be repeated for credit as topics vary.

#### **Lit/Co 278. Communications and Literature (4)**

The study of literary texts from the twin vantage points of communications theory and literary theory. The examination of how qualities of a text such as those of message, symbol, and image have related significance in accordance with the evaluative categories of both these disciplines. May be repeated for credit as topics vary.

#### **Lit/Co 279. Literary Studies and Linguistics (4)**

Fundamentals of linguistics. The relationship of literary theories and current linguistic theory. Examination of formalist and structuralist analysis of literary texts.

#### **Lit/Co 280. Introduction to Computer Applications to Literary Study (4)**

For literature students without previous experience with computers. Introduces students to the basic vocabulary, availability of software, hardware, computer programs for textual editing, concordance preparation, stylistic analysis, etc. Prepares students to carry on analysis of literary texts unavailable through conventional means, e.g., stylistic analysis, variation for spoken or written language norms, determination of unknown authors, etc.

#### **Lit/Co 281. Literature and Film (4)**

A study of literature and film in relation to one another, to critical and aesthetic theories, and to historical contexts. Analysis of literary and filmic texts, genres, movements, and/or expressive modes (e.g., narrative). May be repeated for credit as topics vary.

#### **Lit/Co 296. Research Practicum (1-12)**

Laboratory research on special topics under the direction of individual faculty members. May be taken by individuals or small groups. Offered for repeated registration. (S/U grades only.)

#### **Lit/Co 297. Directed Studies (1-12)**

Guided and supervised reading in a broad area of literature. Offered for repeated registration. (S/U grades only.)

#### **Lit/Co 298. Special Projects (4)**

Treatment of special topics in comparative literature. Offered for repeated registration. (S/U grades only.)

#### **Lit/Co 299. Thesis (1-12)**

Research for the dissertation. Offered for repeated registration. (S/U grades only.)

### ENGLISH AND AMERICAN LITERATURE

#### Lower Division

#### **Lit/En 17. Introduction to Afro-American Literature (4)**

A lecture discussion course that examines a major topic or theme in Afro-American literature as it is developed over time and across the literary genres of fiction, poetry, and belle lettres. A particular emphasis of the course is how Afro-American writers have adhered to or departed from conventional definitions of genre.

#### **Lit/En 21-22-23. The English Literary Imagination (4-4-4)**

Major figures and works in English literature from the Middle Ages to the present day, including *Beowulf*, Chaucer, Spenser, Shakespeare, Milton, Swift, Pope, the Romantics, Tennyson, Browning, Yeats, T. S. Eliot; together with novels by such authors as Fielding, Jane Austen, Dickens, Thackeray, Hardy, and Joyce.

21. *The Middle Ages and the Renaissance*

22. *Neoclassicism and Romanticism*

23. *The Rise of Modernism*

**Lit/En 24. The American Literary Imagination (4)**

An introduction to American literature, centered mainly on the close reading and interpretation of major writers — with due attention, however, to selected minor writers — so that the student, aided and guided by the lectures, can get a sense of the scope of American literature as a whole and also of its relationship to the course of American social, cultural, and intellectual history.

**Lit/En 50. Introduction to Shakespeare: The Theatre and the World (4)**

An introduction to Shakespeare's dramatic achievement through the study of several major plays — representative comedies, histories, and tragedies — in their literary, intellectual, and social contexts.

## Upper Division

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

**Lit/En 105. Old English Literature (4)**

A study of Old English poetry and prose. Texts will be read in translation.

**Lit/En 106. The Medieval Period (4)**

Studies in medieval English literature. Topics such as medieval allegory in English, Chaucer's contemporaries, Middle English lyrics and Middle English romances, as well as surveys of Middle English literature will be presented.

**Lit/En 107. Chaucer (4)**

A study of Chaucer's poetic development, beginning with *The Book of the Duchess* and *The Parliament of Fowls*, including *Troilus and Criseyde*, and concluding with substantial selections from *The Canterbury Tales*.

**Lit/En 108. The Waning of the Middle Ages (4)**

Studies in English literature of the late Middle Ages and early Renaissance. Various topics, including the craft-cycle plays, moralities, and interludes, the Scottish Chaucerians, fifteenth-century poetry, Malory, and romances, visions, and satires of the late Middle Ages.

**Lit/En 110. The Renaissance: Themes and Issues (4)**

Major literary works of the Renaissance, an exciting period of social and cultural transformation in England as elsewhere in Europe. Topics may include a central theme (e.g., humanism, reformation, revolution), a genre (e.g., pastoral), or comparison with other arts and sciences.

**Lit/En 112. Shakespeare I: The Elizabethan Period (4)**

A lecture/discussion course exploring the development of Shakespeare's dramatic powers in comedy, history, and tragedy, from the early plays to the middle of his career. Dramatic forms, themes, characters, and styles will be studied in the contexts of Shakespeare's theatre and his society.

**Lit/En 113. Shakespeare II: The Jacobean Period (4)**

A lecture/discussion course exploring the rich and varied achievements of Shakespeare's later plays, including the major tragedies and late romances. Dramatic forms, themes, characters, and styles will be studied in the contexts of Shakespeare's theatre and his society.

**Lit/En 114. Shakespeare III: Stage, Film, and Television (4)**

A lecture/discussion/laboratory course involving the close study of six to eight plays representative of Shakespeare's artistic career with particular emphasis upon the interrelation of Elizabethan plays and the stage and the critical implications of transposing plays to film and television.

**Lit/En 115A. The Sixteenth Century: Themes and Issues (4)**

Selected topics concerned with sixteenth-century English literature as a whole.

**Lit/En 115D. The Golden Age of Elizabethan Literature (4)**

An introduction to the literary achievement of Elizabethan England during the last two decades of the sixteenth century. Works by major writers in a variety of literary forms (e.g., sonnet, mythological poem, romantic epic, pastoral, satire, prose

fiction, heroic and tragic drama) are studied in relation to relevant social contexts.

**Lit/En 115E. Elizabethan Verse: Poems, Poetics, and Society (4)**

An introduction to the reading of Renaissance poems. Elizabethan poetry in a variety of forms will be studied in the context of Elizabethan poetics, cultural values, and social relations.

**Lit/En 116. Elizabethan and Jacobean Drama (4)**

The study of representative plays from one of the great moments in the history of dramatic literature. Tragedies and comedies primarily by Shakespeare's contemporaries and successors are read in the context of the historical, social, and intellectual background of the period.

**Lit/En 117A. The Seventeenth Century: Themes and Issues (4)**

Selected topics in English literature during a period when writers felt deeply the impact of social change, religious controversy, the emergence of the "New Science," and the English Civil War. Readings chosen from among the works of a diverse group of writers including Jonson, Donne, Bacon, Milton, Marvell, and Dryden.

**Lit/En 117B. Seventeenth-Century Verse (4)**

A study of the varieties of poetry and poetic style from the end of the reign of Elizabeth I up to the Restoration. The course may consider major poets such as Donne, Jonson, Herbert, or Marvell individually and comparatively. Or it may examine a particular mode (e.g., metaphysical or cavalier poetry) through which poets who share stylistic and thematic concerns are studied.

**Lit/En 117C. Seventeenth-Century Prose (4)**

Studies in the creation and development of a tradition of English prose style. Topics may include the relationship between the writing of prose and the exploration of human personality, the effects of religious controversy on prose style, or the emergence of a "plain style" under the influence of the New Science.

**Lit/En 118. Milton (4)**

A critical examination of the major works, including *Paradise Lost*, by an author who was both a central figure in English political life in a revolutionary age and, in the view of most critics, the greatest non-dramatic poet in the English language. The course will study his poetic development in a variety of historical contexts.

**Lit/En 119. Restoration Literature (4)**

The literature of a period which saw the reopening of the theatres and the reestablishment of a flourishing dramatic tradition in England. Readings include examples of Restoration comedy and tragedy; the poetry and criticism of John Dryden and others who helped to found a "neoclassical" aesthetic in English literature.

**Lit/En 120A. The Eighteenth Century: Themes and Issues (4)**

Selected topics in English literature during an age of unsurpassed satirical writing, widespread speculation on aesthetic experience as critical premises shifted from classic to romantic, and exuberant creativity in the varied works of such authors as Pope, Swift, Gibbon, Burke, Johnson, and Blake.

**Lit/En 120B. The Age of Pope (4)**

Pope, Swift, Addison, Steele, Gay, and their contemporaries.

**Lit/En 120C. Samuel Johnson and His Time (4)**

Johnson, Boswell, Burke, Goldsmith, and their contemporaries.

**Lit/En 120D. William Blake and the Age of Sensibility (4)**

A study of the great visionary poet and artist, William Blake, in the context of several of his eighteenth-century contemporaries, such as Gray, Collins, Chatterton, and Cowper.

**Lit/En 125A. Romanticism: Themes and Issues (4)**

Selected topics concerned with the romantic period as a whole.

**Lit/En 125B. First Generation Romantic Poets (4)**

The poets who came of age during the French Revolution and who inaugurated literary modes that continue in our own time: Wordsworth, Coleridge, Blake, and their contemporaries.

**Lit/En 125C. Second Generation Romantic Poets (4)**

Byron, Keats, Shelley, and their contemporaries.

**Lit/En 125D. Romantic Prose (4)**

Romantic critical theory and imaginative writing in prose.

**Lit/En 125E. The Romantics and the Visual Arts (4)**

An examination of the links between the work of one or more of the Romantic writers and specific aspects of iconography and representation in the visual arts.

**Lit/En 125G. Keats and His Poetical Heirs (4)**

The major poetry of John Keats considered together with selected works influenced by him, including poems by such authors as Tennyson, Christina Rossetti, Hopkins, Hardy, Yeats, and Stevens.

**Lit/En 127A. The Victorian Period: Themes and Issues (4)**

Selected topics concerned with Victorian literature as a whole.

**Lit/En 127B. Victorian Poetry (4)**

Tennyson, Browning, Arnold, Clough, Hopkins, and their contemporaries.

**Lit/En 127C. Victorian Nonfictional Prose (4)**

Carlyle, Mill, Newman, Arnold, Ruskin, Pater.

**Lit/En 127G. The Nineties: Decade of Decadence (4)**

The literature and culture of a period when the British Empire was at its height, while writers and artists expressed attitudes ranging from jingoism, through obsessive insecurity, to revulsion against the philistine values of society.

**Lit/En 130A. Modern British Literature: Themes and Issues (4)**

Selected topics concerned with modern British literature as a whole.

**Lit/En 130B. Modern British Poetry (4)**

Such poets as Thomas Hardy, D.H. Lawrence, Hugh MacDiarmid, W.H. Auden, Dylan Thomas, Philip Larkin, Ted Hughes, and Geoffrey Hill.

**Lit/En 132. Modern Irish Literature (4)**

The Irish Revival and its aftermath: Yeats, Synge, O'Casey, Joyce, Beckett, and their contemporaries.

**Lit/En 143. The English Novel: Eighteenth Century (4)**

A study of some of the first major novels in English, including such works as *Robinson Crusoe*, *Clarissa*, *Tom Jones*, and *Tristram Shandy*.

**Lit/En 144. The English Novel: Nineteenth Century (4)**

A study of the English novel in the age of Sir Walter Scott, Charlotte and Emily Bronte, Charles Dickens, George Eliot, and Anthony Trollope.

**Lit/En 145. The English Novel: Modern Period (4)**

A study of the English novel in the age of Thomas Hardy, Joseph Conrad, E.M. Forster, Virginia Woolf, D.H. Lawrence, and James Joyce.

**Lit/En 147. Metamorphoses of the Symbol (4)**

An investigation of a single symbol — such as the cave or the mountain — as it functions within the literature and other expressions of widely different historical moments, with an emphasis upon English and American literature. May be repeated for credit as topics vary.

**Lit/En 148. Genres in English and American Literature (4)**

An examination of one or more genres in English and/or American literature; for example, satire, utopian fiction, autobiography, landscape poetry, the familiar essay. May be repeated for credit as topics vary.

**Lit/En 149. Themes in English and American Literature (4)**

A consideration of one of the themes that recur in many periods of English or American literature; for instance, love, politics, the role of women in society. May be repeated for credit as topics vary.

**Lit/En 152. The Origins of American Literature (4)**

Studies in American writing from the Puritans to the early national period (1620-1830) with emphasis on the thrust and continuity of American culture, social and intellectual, through the beginnings of major American writing in the first quarter of the nineteenth century.

## LITERATURE

### Lit/En 154. The American Renaissance (4)

A study of some of the chief works, and the linguistic, philosophical, and historical attitudes informing them, produced by such authors as Emerson, Hawthorne, Melville, Dickinson, and Whitman during the period 1836-1865, when the role of American writing in the national culture becomes an overriding concern.

### Lit/En 155. Interactions Between American Literature and the Visual Arts (4)

An exploration of the parallels between the work of individual writers, or movements, in American literature, and the style and content of the work of certain visual artists. The writers studied are always American; the artists or art movements may represent non-American influences on these American writers. May be repeated for credit as topics vary.

### Lit/En 156. American Literature from the Civil War to World War I (4)

A critical examination of works by such authors as Mark Twain, Henry James, Kate Chopin and Edith Wharton, who were writing in an age when the frontier was conquered and American society began to experience massive industrialization and urbanization.

### Lit/En 158. Modern American Literature (4)

A critical examination of American literature in between World War I and World War II — the age of the great American modernists, among them Pound, H.D., and Eliot; Hemingway, Stein, and Faulkner; Stevens, Moore, and Williams.

### Lit/En 171. American Poetry I — through Early Whitman (4)

Reading and interpretation of American poets from the Puritans through the emergence of Whitman. Lectures will set the appropriate context in sociocultural and literary history.

### Lit/En 172. American Poetry II — Whitman through the Modernists (4)

Reading and interpretation of American poets from Whitman through the principal modernists, Pound, H.D., Eliot, Moore, Stevens, and others. Lectures will set the appropriate context in sociocultural and literary history.

### Lit/En 173. American Fiction I — through Early James (4)

Reading and interpretation of American fiction from its early nineteenth-century origins through the emergence of Henry James. Lectures will set the appropriate context in sociocultural and literary history.

### Lit/En 174. American Fiction II — Since Middle James (4)

Reading and interpretation of American fiction from Henry James through the principal modernists, Fitzgerald, Stein, Welty, Faulkner, and others. Lectures will set the appropriate context.

### Lit/En 175A. New American Fiction — Post-World War II to the Present (4)

Reading and interpretation of American fiction from the early novels of Saul Bellow, Bernard Malamud, and John Updike to the work of such writers as Thomas Pynchon, Robert Coover, Joyce Carol Oates, and Alice Walker. Lectures will set the appropriate context in sociocultural and literary history. May be repeated for credit as topics vary.

### Lit/En 175B. New American Poetry — Post-World War II to the Present (4)

Reading and interpretation of American poets whose work has made its major impact since the last war, such as Charles Olson, Robert Creeley, Denise Levertov, Adrienne Rich, Allen Ginsberg, Frank O'Hara, and John Ashbery. Lectures will set the appropriate context in sociocultural and literary history. May be repeated for credit as topics vary.

### Lit/En 175C. New American Prose — Post-World War II to the Present (4)

Reading and interpretation of American writing in such forms as the personal essay, autobiography, cultural and/or critical journalism, and documentary reportage. Lectures will set the appropriate context in sociocultural and literary history. May be repeated for credit as topics vary.

### Lit/En 176. Major American Writers (4)

A study in depth of the works of major American writers. May be repeated for credit as topics vary.

### Lit/En 177. California Literature (4)

Reading and interpretation of such novelists as London, Norris, Steinbeck, West, and Didion and such poets as Jeffers, Rexroth, Everson, Duncan, and Snyder. May be repeated for credit as topics vary.

### Lit/En 180. Chicano Literature in English (4)

An introduction to the literature written in English by the Chicano population, the men and women of Mexican descent who live and write in the United States. The course will primarily focus on the contemporary period, exploring the dominant themes, motifs, and forms of expression in representative works in the various genres.

### Lit/En 183. Afro-American Prose (4)

Analysis and discussion of the novel, the personal narrative and other prose genres with particular emphasis on the developing characteristics of Afro-American narrative and the cultural and social circumstances that influence their development.

### Lit/En 184. Afro-American Poetry (4)

Close reading and analysis of selected works of Afro-American poetry as they reflect styles and themes that recur in the literature.

### Lit/En 185. Themes in Afro-American Literature (4)

An intensive examination of a characteristic theme, special issue, or period in Afro-American literature. May be repeated for credit when topics vary.

### Lit/En 187. Black Music/Black Texts: Communication and Cultural Expression (4)

Explores roles of music as a traditional form of personal, communal, and political communication among Africans, Afro-Americans, and West-Indians. Special attention given to poetry of black music, blues, improvisational vocal poetry of Jamaican reggae deejays, and other forms of vocal music expressive of contestatory political attitudes in black nations of the Third World.

### Lit/En 190. Seminars (4)

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one section in a single quarter. *Prerequisites:* upper-division standing and permission of department.

### Lit/En 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Gen 191. Oral exam.

### Lit/En 198. Directed Group Study (4)

Research seminars and research, under the direction of a member of the staff. May be repeated for credit three times. (P/NP grades only.) *Prerequisite:* permission of department.

### Lit/En 199. Special Studies (2 or 4)

Tutorial; individual guided reading in an area not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites:* permission of department and upper-division standing.

## Graduate

### Lit/En 211A-B. Old English Literature (4-4)

Lit/En 211A is a study of Old English language, forms and syntax, and a reading of some prose and verse. Lit/En 211B is a study of Old English poetry.

### Lit/En 214. Middle English Literature (4)

Consideration of one or more major figures, texts, or trends in Middle English literature. May be repeated for credit as topics vary.

### Lit/En 221. Sixteenth-Century English Literature (4)

Critical study of one or more major figures, texts, or literary trends in Tudor England. May be repeated for credit as topics vary.

### Lit/En 224. Seventeenth-Century English Literature (4)

Consideration of one or more figures, texts, or trends in seventeenth-century English literature, including the metaphysical poets and Jacobean drama. May be repeated for credit as topics vary.

### Lit/En 226. Shakespeare (4)

Shakespeare's plays in relation to the Elizabethan background; selected major texts. May be repeated for credit as topics vary.

### Lit/En 231. Restoration and Eighteenth-Century English Literature (4)

Consideration of one or more figures, texts, or trends in Restoration and eighteenth-century English literature, including Dryden, Pope, Swift, the early novel, satire. May be repeated for credit as topics vary.

### Lit/En 241. English Literature of the Romantic Period (4)

A study of the major poetry and related prose of early nineteenth-century literature. May be repeated for credit as topics vary.

### Lit/En 245. Nineteenth-Century American Studies (4)

Consideration of some of the principal writers and movements in nineteenth-century American literature. May be repeated for credit as topics vary.

### Lit/En 246. Victorian Literature (4)

Consideration of one or more major figures, texts, or trends in the Victorian period. May be repeated for credit as topics vary.

### Lit/En 251. Twentieth-Century English Literature (4)

Consideration of one or more major figures, texts, or trends in twentieth-century English literature. May be repeated for credit as topics vary.

### Lit/En 252. Studies in Modern American Literature and Culture (4)

Consideration of one or more major figures, texts, or trends in American literature, in particular the relationship between literature and culture. May be repeated for credit as topics vary.

### Lit/En 271. Genres in English (4)

Consideration of one or more genres present in English and/or American literature; for instance, the ballad, landscape poetry, comedy, satire, the familiar essay. May be repeated for credit as topics vary.

### Lit/En 281. Practicum in Literary Research and Criticism (4)

This course will focus on strategies for framing, organizing, and drafting projects in literary research. Students will study and apply various forms of literary methodology and will learn about recent developments in bibliography, textual editing, and research. May be repeated twice for credit as topics vary. (S/U grades only.)

### Lit/En 295. M.A. Thesis (1-8)

Research for the master's thesis. Opened for repeated registration. (S/U grades only.)

### Lit/En 296. Research Practicum (1-12)

Laboratory research on special topics under the direction of individual faculty members. May be taken by individuals or small groups. Offered for repeated registration. (S/U grades only.)

### Lit/En 297. Directed Studies (1-12)

Guided, supervised reading in a broad area of English and American literature. Offered for repeated registration. (S/U grades only.)

### Lit/En 298. Special Projects (4)

Treatment of a special topic in English and American literature. Offered for repeated registration. (S/U grades only.)

### Lit/En 299. Thesis (1-12)

Research for the dissertation. Offered for repeated registration. *Prerequisite:* advancement to candidacy for the Ph.D. degree. (S/U grades only.)

## FRENCH LITERATURE

### Lower Division

## Language and Literature Courses

### Lit/Fr 9. Intermediate French Language (4)

A fourth quarter of French that will satisfy the Revelle Col-



lege language requirement. The course is taught entirely in French and emphasizes the development of reading ability, listening comprehension, and conversational and writing skills. Students who wish to take further courses in French should enroll in the Lit/Fr 10-25-50 sequence rather than in Lit/Fr 9. Offered fall and winter quarters. *Prerequisites: three quarters of the sequence Ling/Fr 31/51 through Ling/Fr 33/53 or its equivalent.*

Ordinarily, students entering the French literature program elect the following sequence: Lit/Fr 10, 25, and 50.

#### Lit/Fr 10-25-50. Readings and Interpretations (4-4-4)

A three-quarter sequence designed to prepare students for upper-division French courses. The course is taught entirely in French and emphasizes the development of reading ability, listening comprehension, and conversational and writing skills. It also introduces the student to basic techniques of literary analysis. It is expected that this sequence will be completed in the course of one academic year. This course may not be repeated for credit. *Prerequisites: Lit/Fr 10-three quarters of the sequence, Ling/Fr 31/51 through Ling/Fr 33/53 or its equivalent, Lit/Fr 25-Lit/Fr 10 or its equivalent, Lit/Fr 50-Lit/Fr 25 or its equivalent.*

## Upper Division

*Prerequisite: upper-division standing or consent of instructor. All upper-division courses are taught in French. Additional prerequisites may be specified below.*

#### Lit/Fr 110A-B-C. Themes in French Intellectual and Literary History (4-4-4)

This three-quarter sequence is designed as an introduction to French literature and literary history. Each quarter will center on a specified period or problem. This sequence is required for French literature majors. *Prerequisites: 110A for 110B, 110B for 110C.*

110A. Nineteenth and Twentieth Centuries

110B. Seventeenth and Eighteenth Centuries

110C. Medieval and Renaissance

(The chronological order is reversed in order to reduce difficulties.)

#### Lit/Fr 115. Explication de texte/Close Reading (4)

A course in a fundamental technique of literary analysis — close reading — central to literary study in France. Designed for upper-division students planning further work in literature. Application of the close-reading technique to a variety of examples from different periods and genres.

#### Lit/Fr 121. The Middle Ages and the Renaissance (4)

Major literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period. Medieval texts in modern French translation. May be repeated for credit as topics vary.

#### Lit/Fr 122. Seventeenth Century (4)

Major literary works of the seventeenth century. May be repeated for credit as topics vary.

#### Lit/Fr 123. Eighteenth Century (4)

Major literary works and problems of the eighteenth century. May be repeated for credit as topics vary.

#### Lit/Fr 124. Nineteenth Century (4)

Major literary works of the nineteenth century. May be repeated for credit as topics vary.

#### Lit/Fr 125. Twentieth Century (4)

Major literary works and problems of the twentieth century. May be repeated for credit as topics vary.

#### Lit/Fr 140. Composition and Stylistics (4)

Analysis of classical and modern French literary texts to increase the student's sensitivity to style and improve his or her ability to write and speak French. *Prerequisite: Lit/Fr 25.*

#### Lit/Fr 145. French Literature (4)

One or more periods or authors in French literature. Texts will be read in the original language. May be repeated for credit as topics vary.

#### Lit/Fr 148. Genres of French Literature (4)

An examination of one or more major or minor genres of French literature: for example, drama, novel, poetry, satire, prose poem, essay.

#### Lit/Fr 151. Major French Authors (4)

A study in depth of the works of a major French writer. Recommended for students whose primary literature is French. May be repeated for credit as topics vary.

#### Lit/Fr 152. Literature and Ideas (4)

This course will center on writers or movements of international literary, cultural, or ideological significance.

#### Lit/Fr 160. Poetic Analysis (4)

Through the examination of a group of texts that transcends the boundaries of historical periodization, this course will introduce the student to the basic modes of poetic analysis. The emphasis of the course will be on the acquisition of a method and the mastery of specific techniques of reading poetic texts rather than on their content or on the historical continuity and/or development of their themes or forms.

#### Lit/Fr 190. French Literary Criticism (4)

A seminar designed to introduce advanced students in literature to French literary criticism as it has developed in France since the nineteenth century. Topics to be treated will include the complex relations between literature and literary criticism, the emergence of literary criticism as an autonomous literary genre, and the impact of individual writers and critics on our understanding of literature and criticism.

#### Lit/Fr 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Literature/Gen 191. Oral exam.

#### Lit/Fr 198. Directed Group Study (4)

Research seminars and research, under the direction of a member of the staff. (P/NP grades only.) *Prerequisites: upper-division standing and special permission of department.*

#### Lit/Fr 199. Special Studies (2 or 4)

Tutorial; individual guided reading in areas of French literature not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## Graduate

#### Lit/Fr 211. Introduction to Old French Language and Literature (4)

An introduction to the reading of Old French, and a study of the medieval period through original texts. May be repeated for credit as topics vary.

#### Lit/Fr 221. Sixteenth-Century French Literature (4)

Critical study of one or more major figures, texts, or literary trends of the French Renaissance. May be repeated for credit as topics vary.

#### Lit/Fr 224. Seventeenth-Century French Literature (4)

Consideration of one or more major figures, texts, or trends in seventeenth-century French literature. May be repeated for credit as topics vary.

#### Lit/Fr 231. Eighteenth-Century French Literature (4)

Consideration of one or more major figures, texts, or trends in eighteenth-century French literature. May be repeated for credit as topics vary.

#### Lit/Fr 241. Nineteenth-Century French Literature (4)

Consideration of one or more major figures, texts, or trends in nineteenth-century French literature. May be repeated for credit as topics vary.

#### Lit/Fr 251. Twentieth-Century French Literature (4)

Selected topics in modern French literature and thought. May be repeated for credit as topics vary.

#### Lit/Fr 260. Poetic Analysis (4)

Through the examination of a group of texts that transcends the boundaries of historical periodization, this course will emphasize the methods and techniques of poetic analysis. The particular attention given to one or several approaches to the text — formal, thematic, textual, etc. — as well as the specific composition of the corpus of texts to be studied will

vary with each instructor of the course. In every case, however the focus will be on the assimilation of a method and the mastery of a specific technique of reading poetic texts rather than on their content or on the historical continuity of their themes or forms.

#### Lit/Fr 265. Topics in French Literature (4)

An examination of one or more major topics in French literature.

#### Lit/Fr 271. Critical Theory in France (4)

An introduction to fundamental issues of literary studies today, through readings and analyses of the works of thinkers who have greatly influenced the present state of the field of literature. The course will treat such contemporary issues as the nature of the literary object, the problem of literary specificity and of literary language, problems related to the definition of a context for literature, the question of its historical nature, and the relation between literary and extra-literary fields. While focusing on contemporary problems and concerns, the course will at the same time trace their emergence in the works of writers, literary critics, philosophers, and historians of preceding periods. *Required of all graduate students in French.*

#### Lit/Fr 295. M.A. Thesis (1-8)

Research for the master's thesis. Opened for repeated registration up to eight units. (S/U grades only.)

#### Lit/Fr 296. Research Practicum (1-12)

Laboratory research on special topics under the direction of individual faculty members. Can be taken by individuals or small groups. Offered for repeated registration. (S/U grades only.) *Prerequisite: consent of the instructor.*

#### Lit/Fr 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of French literature. Offered for repeated registration. (S/U grades only.) *Prerequisite: consent of the instructor.*

#### Lit/Fr 298. Special Projects (4)

Treatment of a special topic in French literature. Offered for repeated registration. (S/U grades only.) *Prerequisite: consent of the instructor.*

#### Lit/Fr 299. Thesis (1-12)

Research for the dissertation. Offered for repeated registration. *Prerequisite: student must be advanced to candidacy for the Ph.D. degree. (S/U grades only.)*

## GENERAL LITERATURE

In both lower- and upper-division general literature courses, texts may be read in English translation when necessary, and lectures and discussions are conducted in English.

## Lower Division

#### Lit/Gen 4A-B-C-D-E-F. Fiction and Film in Twentieth-Century Societies (4-4-4-4-4-4)

A study of modern culture and of the way it is expressed and understood in novels, stories, and films. The sequence aims at an understanding of relationships between the narrative arts and society in the twentieth century, with the individual quarters treating fiction and film of the following language groups:

4A. French

4B. German

4C. Spanish

4D. Italian

4E. Russian

4F. Chinese/Japanese

#### Lit/Gen 6A-B-C. Understanding Literature: Fiction, Poetry, and Drama (4-4-4)

An introduction to the reading, interpretation, and appreciation of literature, according to the major genres, and corresponding to the three quarters of the academic year. There is



## LITERATURE

a varying emphasis on themes and techniques in selected works from different periods and cultures.

6A. Fiction

6B. Poetry

6C. Drama/Comedy

### Lit/Gen 19A-B-C. Introduction to the Ancient Greeks and Romans (4-4-4)

This interdisciplinary sequence includes the literature, mythology, art, philosophy, and history of ancient Greece and Rome, a complex civilization which had a determining influence on all later Western culture.

### Third World Studies 21-22-23. Third World Literatures (4-4-4)

The courses in this sequence are equivalent to general literature courses. The sequence satisfies Third College general education requirements.

## Upper Division

### European Literature in Translation

#### Lit/Gen 120. The Classical Tradition (4)

Greek and Roman literature in translation. May be repeated for credit as topics vary.

#### Lit/Gen 123. Studies in Eighteenth-Century European Literature (4)

Topics to be considered include the age of sensibility, enlightenment, neoclassicism. Attention given to historical and cultural contexts.

#### Lit/Gen 124. Studies in European Romanticism (4)

Attention given to historical and cultural contexts. Topics to be considered include the concept of nature, the reaction to science, the role of the imagination. May be repeated for credit as topics vary.

#### Humanities 132A-B-C. Rise of Christianity (4-4-4)

Courses in this sequence fulfill major/minor requirements in literature.

#### Lit/Gen 134. Literature of the Renaissance (4)

A study of literary/humanistic texts from various cultures involved in the European Renaissance.

#### Lit/Gen 140A. Survey of Russian Literature in Translation, Part I: 1800-1860 (4)

A study of literary works from Pushkin to the young Dostoevsky. All readings will be in English.

#### Lit/Gen 140B. Survey of Russian Literature in Translation, Part II: 1860-1917 (4)

A study of literary works from mid-nineteenth century to the Revolution. All readings will be in English.

#### Lit/Gen 141. Soviet Literature in Translation (4)

A study of literary works from the Soviet period. All readings will be in English. May be repeated for credit as topics vary.

#### Lit/Gen 142. Genres in Russian Literature in Translation (4)

An examination of one or more genres in Russian literature: for example, the novel, the short story, autobiography, drama, poetry. All readings will be in English. May be repeated for credit as topics vary.

#### Lit/Gen 143. Single Authors in Russian Literature in Translation (4)

A study of literary works by a single Russian author. All readings will be in English. May be repeated for credit when authors vary.

#### Lit/Gen 144. Spanish Literature in Translation (4)

One or more periods or authors in Spanish literature. Texts may be read in English. May be repeated for credit as topics vary.

#### Lit/Gen 145. French Literature in Translation (4)

One or more periods or authors in French literature. Texts may be read in English. May be repeated for credit as topics vary.

#### Lit/Gen 148. Italian Literature in Translation (4)

One or more periods or authors in Italian literature. Texts may be read in English. May be repeated for credit as topics vary.

#### Lit/Gen 149A. German Literature in Translation (4)

One or more aspects of German literature such as major authors, the contemporary novel, nineteenth-century poetry, German expressionism. Texts may be read in English or the original language. May be repeated for credit as topics vary.

#### Lit/Gen 149B. German Literary Prose in Translation (4)

The development of major forms and modes of German literary prose. May be repeated for credit as topics vary.

#### Lit/Gen 151. Dante in Translation (4)

*Divine Comedy* with an emphasis on Dante's relation to the courtly love lyric and to the institutions of learning of his time.

#### Lit/Gen 157. Yiddish Literature in Translation (4)

Representative works of fiction, drama, poetry, parable, film, and song from Eastern European Jewish culture. Topics include Chasidism, Zionism, the life of the *shtetl*, relations with the biblical and rabbinic traditions, and a study of literary forms and styles. May be repeated for credit as topics vary.

#### Lit/Gen 158. Romance, Science Fiction, and the Language of Warfare (4)

A critical reading of Ariosto's *Orlando Furioso* with special attention to those themes, narrative forms, and ideological conflicts still operative in today's culture.

## Third World Literature in Translation

#### Lit/Gen 135. Novel and History in the Third World (4)

This course sets out to explore the relation between the novel and the "dependent" history of the Third World, contrasting and comparing the uses of history in the European novel as defined in the theoretical analysis of Lukacs with uses of history in the Third World novel. An analysis of major themes and movements common to selected ethnic literature in the United States and national literatures in the Third World.

#### Lit/Gen 136. African Oral Literature (4)

This is a survey of various genres of African and oral literary traditions. Although the focus is on oral narrative genres, investigation of proverb, riddle, praise poetry, and epic also falls into the compass of the course. The central concern will be the development and use of a methodology to analyze the aspects of performance, composition, and education in oral traditional systems.

#### Lit/Gen 137. Introduction to Literature and Film of Modern Africa (4)

This course traces the rise of modern literature in traditional African societies disrupted by the colonial and neocolonial experience. Contemporary films by African and Western artists will provide an additional insight into the complex social self-images of the continent.

#### Lit/Gen 138. Contemporary Caribbean Literature (4)

This course will focus mainly on contemporary literature of the English-speaking Caribbean as a Third World area of experience. The parallels and contrasts of this literature with that of the Spanish- and French-speaking Caribbean will also be explored.

#### Lit/Gen 146. Latin American Literature in Translation (4)

Reading of representative works in Latin American literature with a view to literary analysis (form, theme, meaning), the developmental processes of the literature, and the many contexts: historical, social, cultural. Texts may be read in English. May be repeated for credit as topics vary.

#### Lit/Gen 147. Mexican Literature in Translation (4)

Study of popular novels, movements, traditions, key authors, or major trends in modern Mexican literature. Texts may be read in English. May be repeated for credit as topics vary.

#### Lit/Gen 150A. Classical Chinese Literature in Translation (4)

The course will focus on a few representative masterpieces of Chinese literature in its classical age, with emphasis on the formal conventions and the social or intellectual presuppositions that are indispensable to their understanding. May be repeated for credit as topics vary.

#### Lit/Gen 150B. Modern Chinese Literature in Translation (4)

A survey of representative works of the modern period from 1919 to 1949. May be repeated for credit as topics vary.

#### Lit/Gen 150C. Contemporary Chinese Literature in Translation (4)

An introductory survey of representative texts produced after 1949, with particular emphasis on the social, cultural, and political changes. May be repeated for credit as topics vary.

#### Lit/Gen 152A-B-C-D-E. Earlier Japanese Literature in Translation (4-4-4-4-4)

An introduction to earlier Japanese (*bungo*) literature in translation. Each course will focus on several works, placing their forms in the historical context. No knowledge of Japanese required. May be repeated for credit as topics vary.

152A. General

152B. Poetry

152C. Prose Fiction

152D. Drama

152E. Essay, Travelogue, Diary, etc.

#### Lit/Gen 153A-B-C-D-E. Later Japanese Literature in Translation (4-4-4-4-4)

An introduction to later Japanese (*kogo*) literature in translation. Each course will focus on several "modern" works, placing their form in the historical context. No knowledge of Japanese required. May be repeated for credit as topics vary.

153A. General

153B. Poetry

153C. Prose Fiction

153D. Drama/Film

153E. Essay, Criticism, etc.

#### Lit/Gen 154. A Single Japanese Author (In Translation) (4)

A good number of Japanese authors are by now well represented in English translation. The course will focus on one writer and his or her relationships to the social context. May be repeated for credit as topics vary.

#### Lit/Gen 155. Special Topics in Japanese Literature (4)

The course will focus on important problematics of literary studies as they relate to Japan (e.g., "feminism," "modernity," "literary mode of production," "Orientalism and nativism"). No knowledge of Japanese required. May be repeated for credit as topics vary.

#### Lit/Gen 156. Japanese Literary Works/Writers in Japanese (4)

Intended for students with the knowledge of the language. Selections range from Heian to contemporary works. Critical examination of the texts; not just translation exercise. May be repeated as topics vary. Consult with the instructor before registering for the course. May be repeated for credit as topics vary.

## Topics in Literature

#### Lit/Gen 104. The Bible and Western Literature (4)

Biblical and related texts that influenced the great writers of the Middle Ages and the Renaissance, including selections from the Jewish and Christian scriptures.

#### Lit/Gen 108. The Jewish Experience in Literature (4)

Literary works from various periods dealing with Jewish themes, with an emphasis on modern Jewish writing in America, Russia, etc. May be repeated for credit as topics vary.

#### Lit/Gen 109. Jewish Mysticism (4)

Theological and literary texts covering the broad range of Jewish mystical experience, with discussion of analogous developments in other religious traditions.

#### Lit/Gen 110. The Bible: The Prophetic Books (4)

The prophetic books of the Bible in their historical contexts. The relationship between the prophetic and narrative books.

Literary-critical analysis, theological issues, reference to archaeological data.

**Lit/Gen 111. The Bible: The Narrative Books (4)**

Examination of the biblical accounts in their ancient Near Eastern context. Literary-critical, form-critical, and textual analysis. Attention to related literature and to archaeological data; consideration of theological issues.

**Lit/Gen 112. The Bible: The Poetic Books (4)**

Study of biblical poetry, its settings, genres, and themes. Analysis of metre and structure with particular attention to the use of parallel. Comparison with Canaanite and Mesopotamian examples.

**Lit/Gen 113. Medieval Hebrew Literature (4)**

Major literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period.

**Lit/Gen 114. Hebrew Literature: The Modern Period (4)**

Selected topics in modern Hebrew literature.

**Lit/Gen 115. Topics in the Prophets (4)**

Study of a single book, period, or issue in the biblical prophets.

**Lit/Gen 116. Topics in Biblical Narrative (4)**

Study of a single book, period, or issue in the narrative books of the Bible.

**Lit/Gen 117. Topics in Biblical Poetry (4)**

Study of a single book, period, or issue in the poetic books of the Bible.

**Lit/Gen 119. Mythology (4)**

A study of various bodies of myth: their content, form, and meaning. May be repeated for credit as topics vary.

**Lit/Gen 121. World Mythology (4)**

An exposure to mythological texts from a variety of cultures and eras, with an emphasis on identifying and interpreting still-vital concerns in those texts. Different schools of myth-analysis will also be introduced and evaluated for their persuasiveness and utility.

**Lit/Gen 122. Words and Their Vicissitudes (4)**

An inquiry into several aspects of words: etymology, semantic change and the inescapability of metaphor, among others. These explorations will have as their end the development of sound methods of investigating verbal artifacts.

**Lit/Gen 125. Specialized Genres in Literature (4)**

The study of literary genres that do not fall into the ordinary categories of lyric, drama, and fiction. Topics vary from year to year. May be repeated for credit as topics vary.

**Lit/Gen 126. Epic Poetry (4)**

A study of major epics, in translation if their original language is not English. May be repeated for credit as topics vary.

**Lit/Gen 127. Prose Fiction (4)**

Aspects of prose fiction, not confined to a single national literature. Texts may be read in English. May be repeated for credit as topics vary.

**Lit/Gen 128. The Drama (4)**

Aspects of the drama, not confined to a single national literature. Texts may be read in English. May be repeated for credit as topics vary.

**Lit/Gen 129. Lyric Poetry (4)**

Studies in lyric poetry. Not confined to a single national literature. Texts may be read in English.

**Lit/Gen 130. Introduction to Criticism (4)**

Theories of criticism and the role and function of critic and artist in society.

**Lit/Gen 131. Literature and Ideas (4)**

The course will center on writers or movements of international literary, cultural, or ideological significance. The texts studied, if foreign, may be read either in the original language or in English. May be repeated for credit as topics vary.

**Lit/Gen 132. Women and Literature (4)**

This course will explore the relationship between women and literature, i.e., women as producers of literature, as objects of literary discourse, and as readers. Foreign language texts will be read in translation. May be repeated for credit as topics vary.

**Lit/Gen 133A-B-C. Modernity and Literature (4-4-4)**

This course explores the various cross-cultural historical, philosophical, and aesthetic ideas which formed the basis of most twentieth-century literature. By pursuing comparatist tenets, this team-taught sequence will draw on diverse influences and areas to illustrate some of the ways in which literature not only reflects historical periods but also defines and shapes them. Literature from the Americas, Europe, Asia, and Africa will be studied through lectures and the reading of texts in English translation.

**Lit/Gen 139. Psychoanalysis and Literature (4)**

Psychoanalytic approaches to art and literature. Readings in psychoanalytic literature and interpretation (from Freud to the present). Psychoanalysis as it defines, and is defined by, modernity.

**Lit/Gen 159. Popular Literature (4)**

A study of various forms of popular literature, such as the Broadway play, song lyrics, the detective novel, etc. May be repeated for credit as topics vary.

**Lit/Gen 161. The Forms of Folklore (4)**

A survey of the range of folkloric phenomena as exemplified by major and minor forms — narrative, legend, myth, superstition, speech, custom, games, and music. Examples will be considered both as artistic entities and as social documents.

**Lit/Gen 162. Folk and Fairy Tales (4)**

A study of folk and fairy tales from various cultures, from the point of view of literary form, psychological meaning, and cultural function. May be repeated for credit as topics vary.

**Lit/Gen 163. Children's Literature (4)**

A study of literature written for children in various cultures and periods. May be repeated for credit as topics vary.

**Lit/Gen 164. Fantasy and Science Fiction (4)**

Works of fantasy and/or science fiction will be studied in their cultural context. May be repeated for credit as topics vary.

**Lit/Gen 165. Adolescent Literature (4)**

A study of fiction written for the young adult in various cultures and periods. Consideration will be given to the young adult hero in fiction. May be repeated for credit as topics vary.

**Lit/Gen 166. Words into Images (4)**

With the proliferation of comic books, photostories, films, and television, these efforts toward the visualization of the verbal abstractions of literature have become a central concern of the entertainment industry. This course will explore the cultural implications of the transformation of words into images: what is gained, and what is lost in the translation.

**Lit/Gen 167. Classic Science Fiction Films and Literature (4)**

This course will attempt to define in literature and film the genre of science fiction by tracing the development of its characteristic themes and preoccupations from the first major science fiction film, *Metropolis*, to a recent remake of the classic, *The Thing*.

**Lit/Gen 168. The Psychology of the Filmic Text (4)**

This course will examine a variety of films using different perspectives and methods of psychology to analyze the types of problems raised by the nature of cinematic communication. Topics will include an introduction to basic elements of cinematography, theoretical and technical bases of film's "grammar," perception of moving pictures, the function and status of sound, the influence of film on behavior and culture (and vice versa), the representation of psychological and social interaction, the communication of narrative and spatial information, the generation and translation of films' conventions, and the parameters which the medium and the culture impose upon the attempt to express various forms of abstraction in the concrete visual language film.

**Lit/Gen 169. Culture, Ideology, and Collective Memory (4)**

How do societies remember (and forget) the past and, through this process of collective memory, conceive their present? What stories are stored, who constructs them, and what purposes do they serve? Readings in the theory of ideology and close study of empirical cases.

**Lit/Gen 170. Contemporary Literature (4)**

A study of novels and authors of the present and recent times. May be repeated for credit as topics vary.

**Lit/Gen 172. Contemporary Science Fiction (4)**

In the last twenty years or so a new generation of science fiction writers has taken this relatively young literary genre into new realms of subject matter and technique. In this course some of the most recent works of modern science fiction will be read closely and discussed in depth. May be repeated for credit as topics vary.

**Lit/Gen 173. Visual Arts and Literature (4)**

An investigation into themes and styles common to literature and visual arts. May be repeated for credit as topics vary.

**Lit/Gen 174. Comedy (4)**

Comedy in fiction and film from ancient times to contemporary, including the Bible, Aristophanes, Shakespeare, and modern writers and film makers.

**Lit/Gen 175. The Art of Reading in the Act of Popular Culture (4)**

"The Art of Reading . . ." would feature reading of selected popular novels in the background of some contemporary critical theory. Discussion in the course will freely interplay high and low culture. Students in the class will establish provisional criteria for judgment of the various novels based on the course background materials and their personal collective literary experience.

## Seminars/Independent Studies

**Lit/Gen 190. Seminars (4)**

These seminars are devoted to a variety of special topics, including the works of single authors, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter. *Prerequisites: upper-division standing, consent of instructor, and permission of department.*

**Lit/Gen 191. Honors Seminar (4)**

Explorations in critical theory and method. This course, which is designed to prepare students for the writing of an honors thesis, is open only to literature majors who have been admitted to the Literature Honors Program. Literary texts will be drawn from several languages, but will be available in English translation. (The Honors Seminar may be applied toward the primary concentration in the literature major.)

**Lit/Gen 195. Apprentice Teaching (0 & 4)**

Undergraduate instructional assistance. Responsibilities both in area of learning and instruction. A student must (1) prepare reading materials assigned by the professor; (2) lead student discussions; (3) assist professor in grading; (4) prepare a report to the professor at the conclusion of the quarter concerning his or her work.

**Lit/Gen 196. Honors Thesis (4)**

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Gen 191. Oral exam.

**Lit/Gen 198. Directed Group Study (4)**

Research seminars and research, under the direction of a member of the staff. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

**Lit/Gen 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas of literature (in translation) not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## LITERATURE

### Graduate

#### Lit/Gen 500. Apprentice Teaching in Literature (2-4)

Consideration of pedagogical methods appropriate to undergraduate teaching in literature courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

#### Lit/Gen 501. Apprentice Teaching in Humanities (2-4)

Consideration of pedagogical methods appropriate to undergraduate teaching in humanities sequences under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

#### Lit/Gen 502. Apprentice Teaching in Muir College (2-4)

Consideration of pedagogical methods appropriate to undergraduate teaching in Muir College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

#### Lit/Gen 503. Apprentice Teaching in Third College (2-4)

Consideration of pedagogical methods appropriate to undergraduate teaching in Third College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

#### Lit/Gen 504. Apprentice Teaching in Warren College (4)

Consideration of pedagogical methods appropriate to undergraduate teaching in Third College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

#### Lit/Gen 505. Seminar on Teaching in the Humanities (4)

A seminar for teaching assistants in the Revelle Humanities/Writing Program. Graduate students appointed to teaching Humanities during the winter and spring quarters must enroll in this seminar during the preceding fall quarter. The course involves the study of major humanistic texts used in the Humanities/Writing Program and the development of interpretive strategies and pedagogical tactics appropriate for teaching beginning undergraduates to read and write about those texts.

## GERMAN LITERATURE

### Lower Division

#### Language and Literature Courses

##### Lit/Ge 10. Readings and Interpretations (4)

This course is taught entirely in German and emphasizes the development of reading ability, listening comprehension, and writing skills. It includes grammar review, lectures, and class discussion. Approximately half of the reading selections are from modern and classical authors, half from nonliterary disciplines — humanities, social sciences, pure and applied sciences. The course is designed to prepare students for Literature 15 and Literature 25. For information on prerequisites, contact the Undergraduate Office of the Department of Literature. Successful completion of Lit. 10 satisfies the requirement for language proficiency in Revelle College.

##### Lit/Ge 15. Advanced Readings and Interpretations (4)

Continuation of German 10 for those students who intend to practice their reading abilities, listening comprehension, and writing skills on a more advanced level. *Prerequisite:* Lit/Ge 10 or consent of instructor.

##### Lit/Ge 25. Composition and Conversation (4)

A course designed for students who wish to improve their ability to speak and write German. *Prerequisite:* Lit/Ge 15 or equivalent or consent of instructor.

##### Lit/Ge 51-52-53-54. Readings in German Literature and Culture (4-4-4-4)

An introduction to German literature. May be taken for three quarters, starting with any quarter. The instructor will advise students when they have achieved sufficient proficiency to proceed to upper-division courses which call for an ability to read extensive texts in German. *Prerequisite:* adequate proficiency in German to handle course assignments, i.e., successful completion of Lit/Ge 25, or equivalent preparation.

51. Middle Ages and Renaissance

52. Classicism and Romanticism: Eighteenth and Nineteenth Centuries

53. The Twentieth Century

54. Baroque and Enlightenment

### Upper Division

*Prerequisite:* upper-division standing or consent of instructor. Normally, a student will be expected to take two courses of the Lit/Ge 51-52-53-54 sequence before being admitted to upper-division courses. Additional prerequisites may be specified below.

##### Lit/Ge 101. German Literary Prose (4)

The development of major forms and modes of German literary prose. May be repeated for credit as topics vary.

##### Lit/Ge 102. German Dramatic Literature (4)

The development of the drama in Germany. May be repeated for credit as topics vary.

##### Lit/Ge 103. German Poetry (4)

The development of major forms and modes of German verse. May be repeated for credit as topics vary.

##### Lit/Ge 123. Eighteenth-Century German Literature (4)

Major literary works as seen against the historical and intellectual background of the period. May be repeated for credit as topics vary.

##### Lit/Ge 124. Nineteenth-Century German Literature (4)

Major literary works, authors, or movements of the nineteenth century. May be repeated for credit as topics vary.

##### Lit/Ge 125. Twentieth-Century German Literature (4)

Major literary works, authors, or movements of the twentieth century. May be repeated for credit as topics vary.

##### Lit/Ge 140. Composition and Stylistics (4)

Analysis of classical and modern German literary texts to increase the student's sensitivity to style and improve his or her ability to write and speak German. Stylistic variations and potentialities will be explored, various classical and modern texts will be analyzed to establish stylistic criteria and guiding principles. One composition per week on various subjects. *Prerequisite:* upper-division standing or consent of instructor.

##### Lit/Ge 149. German Literature (4)

One or more aspects of German literature such as major authors, the contemporary novel, nineteenth-century poetry, German Expressionism. The texts studied will be read in the original language. May be repeated for credit as topics vary.

##### Lit/Ge 151. Goethe (4)

Study of some major works in the context of Goethe's life and milieu. Recommended for literature majors whose primary literature is German. May be repeated for credit as topics vary.

##### Lit/Ge 152. Major German Authors (4)

A study in depth of the works of a major German author. May be repeated for credit as topics vary.

##### Lit/Ge 153. Literature and Ideas (4)

This course will center on German writers or movements of international literary, cultural, or ideological significance. May be repeated for credit as topics vary.

##### Lit/Ge 161. The Forms of Folklore (4)

A survey of the range of folkloristic phenomena as exemplified by major and minor forms — narrative, legend, myth, superstition, speech, custom, games, and music. Examples will be considered both as artistic entities and as social documents.

##### Lit/Ge 190. Seminars (4)

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like.

##### Lit/Ge 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Gen 191. Oral exam.

##### Lit/Ge 198. Directed Group Study (4)

Research seminars and research, under the direction of a member of the staff. May be repeated for credit. (P/NP grades only.) *Prerequisite:* special permission of department.

##### Lit/Ge 199. Special Studies (2 or 4)

Tutorial; individual guided reading in areas of German literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites:* upper-division standing and permission of department.

### Graduate

##### Lit/Ge 202. Methods and Tools of Research (4)

A pragmatic workshop to familiarize students with basic methodological approaches, standard works of literary criticism, and indispensable tools of literary research.

##### Lit/Ge 203. Cultural History of the German Language (4)

Philological survey of the German language with particular attention to historical, cultural, and social interrelations.

##### Lit/Ge 210A-B. Middle High German (4-4)

210A: Introduction to the middle High German language. Reading of texts with exercises in semantics, grammar, etymology, and syntax.

210B: Middle High German II. Analysis of texts representing a variety of genres.

##### Lit/Ge 221. Middle High German Classicism (4)

Medieval epics (heroic and Arthurian) and courtly poetry. Analysis: methods of interpretation and recent research. May be repeated for credit as topics vary.

##### Lit/Ge 231. Eighteenth-Century German Literature (4)

Consideration of one or more major figures, texts, or trends in eighteenth-century German literature. May be repeated for credit as topics vary.

##### Lit/Ge 238. Goethe (4)

A study of Goethe's work in the context of Goethe's life and milieu and of German Classicism. May be repeated for credit as topics vary.

##### Lit/Ge 241. German Romantic Prose (4)

A study of the critical and poetic works of major romantic writers with special attention to romantic poetics. May be repeated for credit as topics vary.

##### Lit/Ge 242. Nineteenth-Century German Literature (4)

Consideration of one or more major figures, texts, or trends in nineteenth-century German literature. May be repeated for credit as topics vary.

##### Lit/Ge 251. The Twentieth Century (4)

A study of the structural, philosophical, and social aspects of twentieth-century German literature. May be repeated for credit as topics vary.

##### Lit/Ge 252. Major German Authors (4)

A study in depth of the work of one major German author. May be repeated for credit as topics vary.

**Liv/Ge 271. Theory of Genres (4)**

An historical approach to the lyric/epic/dramatic and related distinctions, concentrating on the critical reflection and innovative practice of the "German movement." (From Lessing and the Sturm-und-Drang to the Romantik.) May be repeated for credit as topics vary.

**Liv/Ge 272. Genres, Trends, and Forms (4)**

Seminars on literary genres, trends, movements, schools, and on aspects of literary forms and structures in any given era or over a certain period of time. May be repeated for credit as topics vary.

**Liv/Ge 273. Literature and Art (4)**

An investigation into themes and styles common to literature and visual arts. May be repeated for credit as topics vary.

**Liv/Ge 295. M.A. Thesis (1)**

Research for the master's thesis. Opened for repeated registration up to eight units. (S/U grades only.)

**Liv/Ge 296. Research Practicum (1-12)**

Laboratory research on special topics under the direction of individual faculty members. Can be taken by individual or small groups. Offered for repeated registration. (S/U grades only.)

**Liv/Ge 297. Directed Studies (1-12)**

Guided and supervised reading in a broad area of German literature. Offered for repeated registration. (S/U grades only.)

**Liv/Ge 298. Special Projects (4)**

Treatment of a special topic in German literature. Offered for repeated registration. (S/U grades only.)

**Liv/Ge 299. Thesis (1-12)**

Research for the dissertation. Offered for repeated registration. *Prerequisite: student must be advanced to candidacy for the Ph.D. degree.* (S/U grades only.)

**GREEK LITERATURE****Lower Division****Liv/Gk 1. Beginning Greek (4)**

Study of ancient Greek, including grammar and reading.

**Liv/Gk 2. Intermediate Greek (I) (4)**

Continuing of study of ancient Greek, including grammar and reading. *Prerequisite: Liv/Gk 1 or equivalent.*

**Liv/Gk 3. Intermediate Greek (II) (4)**

Continuation of study of ancient Greek, including grammar and reading of texts. *Prerequisites: Liv/Gk 1 and 2 or equivalent.*

**Upper Division**

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

**Liv/Gk 100. Introduction to Greek Literature (4)**

Reading and discussion of selections from representative authors. Review of grammar as needed. *Prerequisite: Liv/Gk 3 or equivalent.*

**Liv/Gk 104. Tragedy (4)**

Readings, in Greek, of one or more of the works of the classical tragedians Aeschylus, Sophocles, and Euripides. May be repeated for credit as topics vary.

**Liv/Gk 106. Comedy (4)**

Readings, in Greek, of one or more of the works of Aristophanes. May be repeated for credit as topics vary.

**Liv/Gk 108. History (4)**

Readings, in Greek, in the works of the ancient historians, including Herodotus, Thucydides, Xenophon, and others. May be repeated for credit as topics vary.

**Liv/Gk 110. Prose (4)**

Readings, in Greek, in the works of ancient prose writers. May be repeated for credit as topics vary.

**Liv/Gk 112. Archaic Period (4)**

Readings, in Greek, of texts from the archaic period. May be repeated for credit as topics vary.

**Liv/Gk 114. Classical Period (4)**

Readings, in Greek, of texts from the fifth and fourth centuries B.C. May be repeated for credit as topics vary.

**Liv/Gk 116. Hellenistic Period (4)**

Readings, in Greek, of texts from the Hellenistic period. May be repeated for credit as topics vary.

**Liv/Gk 119. New Testament Greek (4)**

Readings, in Greek, in the Greek New Testament. May be repeated for credit as topics vary.

**Liv/Gk 121. Epic Poetry (4)**

Readings, in Greek, in the works of Homer, Hesiod, and/or Apollonius Rhodius. May be repeated for credit as topics vary.

**Liv/Gk 123. Lyric Poetry (4)**

Readings, in Greek, of the works of the ancient lyric poets. May be repeated for credit as topics vary.

**Liv/Gk 198. Directed Group Study (4)**

Directed group study in areas of Greek literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

**Liv/Gk 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas of Greek literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

**Graduate****Liv/Gk 297. Directed Studies (1-12)**

Guided and supervised reading in a broad area of Greek literature. Offered for repeated registration. (S/U grades only.)

**Liv/Gk 298. Special Projects (4)**

Treatment of a special topic in Greek literature. Offered for repeated registration. (S/U grades only.)

**HEBREW LITERATURE****Upper Division****Liv/He 104. The Bible and Western Literature (4)**

Biblical and related texts that influenced the great writers of the Middle Ages and Renaissance, including selections from the Jewish and Christian scriptures.

**Liv/He 110. The Bible: The Prophetic Books (4)**

The prophetic books of the Bible in their historical contexts. The relationship between the prophetic and narrative books. Literary-critical analysis, theological issues, reference to archaeological data.

**Liv/He 111. The Bible: The Narrative Books (4)**

Examination of the biblical accounts in their ancient Near Eastern context. Literary-critical, form-critical, and textual analysis. Attention to related literature and to archaeological data; consideration of theological issues.

**Liv/He 112. The Bible: The Poetic Books (4)**

Study of biblical poetry, its settings, genres, and themes. Analysis of metre and structure with particular attention to the use of parallel. Comparison with Canaanite and Mesopotamian examples.

**Liv/He 113. Medieval Hebrew Literature (4)**

Major literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period.

**Liv/He 114. Hebrew Literature: The Modern Period (4)**

Selected topics in modern Hebrew literature.

**Liv/He 115. Topics in the Prophets (4)**

Study of a single book, period, or issue in the biblical prophets.

**Liv/He 116. Topics in Biblical Narrative (4)**

Study of a single book, period, or issue in the narrative books of the Bible.

**Liv/He 117. Topics in Biblical Poetry (4)**

Study of a single book, period, or issue in the poetic books of the Bible.

**Liv/He 190. Seminars (4)**

These seminars are devoted to a variety of special topics, including works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one section in a single quarter. *Prerequisite: upper-division standing or consent of instructor.*

**Liv/He 198. Directed Group Study (4)**

Directed group study in areas of Hebrew literature not normally covered in courses. (P/NP grades only.) *Prerequisite: permission of department.*

**Liv/He 199. Special Studies (2 or 4)**

Tutorial; individual guided reading in areas of Hebrew literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

The following Summer Session course may be of interest:

**Liv/He 197. Field Study: Archaeology and the Bible (4-8)**

Lectures and field work in excavations at the sites of importance to biblical archaeology. Students are expected to produce substantial final papers.

**Graduate****Liv/He 297. Directed Studies (-12)**

Guided and supervised reading in a broad area of Hebrew literature. Offered for repeated registration. (S/U grades only.)

**Liv/He 298. Special Projects (4)**

Treatment of a special topic in Hebrew literature. Offered for repeated registration. (S/U grades only.)

**ITALIAN LITERATURE****Lower Division****Liv/It 1. Beginning Italian (4)**

Fundamentals of Italian grammar, exercises in vocabulary, accidence, and in reading.

**Liv/It 2. Intermediate Italian (I) (4)**

Continuing instruction in Italian grammar, with reading of simple texts. *Prerequisite: Liv/It 1 or consent of instructor.*

**Liv/It 3. Intermediate Italian (II) (4)**

Continuing instruction in Italian grammar, with reading of basic texts. *Prerequisite: Liv/It 2 or equivalent or consent of instructor.*

**Liv/It 50. Advanced Italian (I) (4)**

A second-year course in Italian language and literature. Conversation, composition, grammar reviews, and an introduction to literary and nonliterary texts. *Prerequisite: Liv/It 3 or equivalent or consent of instructor.*

**Liv/It 51. Advanced Italian (II) (4)**

Emphasis on composition discussion of literary texts in Italian. *Prerequisite: Liv/It 50 or equivalent or consent of instructor.*

**Upper Division**

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

**Liv/It 100. Introduction to Italian Literature (4)**

Reading and discussion of selections from representative authors. Review of grammar as needed. *Prerequisite: Liv/It 51 or equivalent or consent of instructor.*

**Liv/It 101. Advanced Stylistics and Conversation (4)**

Analysis of Italian essays, journalism, literature. Intensive practice in writing and Italian conversation. *Prerequisite: Liv/It 100 or consent of instructor.*

**Liv/It 110. Studies in Modern Italian Culture (4)**

Politics, literature, and cultural issues of twentieth-century Italy.



## LITERATURE

### Lit/It 120. Romance, Science Fiction, and the Language of Warfare (4)

A critical reading of Ariosto's *Orlando Furioso* with special attention to those themes, narrative forms, and ideological conflicts still operative in today's culture.

### Lit/It 123. Studies in Modern Poetry

A study of the chief modern Italian poets, including Montale, Ungaretti, and Quasimodo, with attention to long poetic form, and contemporary Italian culture.

### Lit/It 124. Studies in Modern Italian Prose (4)

A study of the chief modern Italian *prosatori* including D'Annunzio, Calvino, Pavese, Pasolini, etc.

### Lit/It 148. Italian Literature (4)

One or more periods of authors in Italian literature. May be repeated for credit as topics vary.

### Lit/It 151. Dante in Translation (4)

*Divine Comedy* with an emphasis on Dante's relation to the courtly love lyric and to the institutions of learning of his time.

### Lit/It 190. Seminars (4)

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems in literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter. *Prerequisites: upper-division standing, consent of instructor, and permission of department.*

### Lit/It 198. Directed Group Study (4)

Directed group study in areas of Italian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

### Lit/It 199. Special Studies (2 or 4)

Tutorial; individual guided reading in areas of Italian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## Graduate

### Lit/It 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of Italian literature. Offered for repeated registration. (S/U grades only.)

### Lit/It 298. Special Projects (4)

Treatment of a special topic in Italian literature. Offered for repeated registration. (S/U grades only.)

## LATIN LITERATURE

### Lower Division

#### Lit/La 1. Beginning Latin (4)

Study of Latin, including grammar and reading.

#### Lit/La 2. Intermediate Latin (I) (4)

Study of Latin, including grammar and reading. *Prerequisite: Lit/La or its equivalent.*

#### Lit/La 3. Intermediate Latin (II) (4)

Study of Latin, including grammar and reading.

### Upper Division

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

#### Lit/La 100. Introduction to Latin Literature (4)

Reading and discussion of selections from representative authors of the Augustan age. Review of grammar as needed. *Prerequisite: Lit/La 3 or equivalent.*

#### Lit/La 102. Prose Composition (4)

Designed for those who have completed more than one upper-division course. Latin prose composition is aimed at refining students' grasp of Latin and appreciation of its varying styles through graded exercises in writing and selected readings. What is gained in such a course is a knowledge of the language from the inside out, rather than the opposite, which is usual in translation courses.

#### Lit/La 106. The Novel (4)

Readings, in Latin, in the works of the Latin novelists. May be repeated for credit as topics vary.

#### Lit/La 108. Prose (4)

Readings, in Latin, of the work of Roman prose writers. May be repeated for credit as topics vary.

#### Lit/La 110. Lyric and Elegiac Poetry (4)

Readings, in Latin, in the works of lyric and elegiac poets. May be repeated for credit as topics vary.

#### Lit/La 112. Epic (4)

Readings, in Latin, in the works of Roman epic poets. May be repeated for credit as topics vary.

#### Lit/La 114. History (4)

Readings, in Latin, in the works of Roman historians. May be repeated for credit as topics vary.

#### Lit/La 116. Pre-Augustan (4)

Readings, in Latin, in the works of Roman writers of the pre-Augustan period. May be repeated for credit as topics vary.

#### Lit/La 118. Augustan (4)

Readings, in Latin, in the works of Roman writers of the Augustan period. May be repeated for credit as topics vary.

#### Lit/La 120. Silver Latin (4)

Readings, in Latin, in the works of Roman writers of the Silver Age. May be repeated for credit as topics vary.

#### Lit/La 122. Late Latin (4)

Readings, in Latin, in the works of Roman writers of the post-Silver Age. May be repeated for credit as topics vary.

#### Lit/La 124. Medieval Latin (4)

Readings, in Latin, in the works of the medieval period. May be repeated for credit as topics vary.

#### Lit/La 129. Renaissance Latin (4)

Readings, in Latin, in the works of the Renaissance period. May be repeated for credit as topics vary.

#### Lit/La 198. Directed Group Study (4)

Directed group study in areas of Latin literature not normally covered in courses. May be repeated three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

#### Lit/La 199. Special Studies (2 or 4)

Tutorial; individual guided reading in areas of Latin literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## Graduate

### Lit/La 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of Latin literature. Offered for repeated registration. (S/U grades only.)

### Lit/La 298. Special Projects (4)

Treatment of a special topic in Latin literature. Offered for repeated registration. (S/U grades only.)

## RUSSIAN LITERATURE

### Upper Division

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

#### Lit/Ru 101A-B-C. Introduction to Russian Literature (4-4-4)

In this course students will study Russian literary texts primarily with a view to improving their knowledge of language and grammar. The study of literary texts will be supplemented with more formal study of advanced grammar. The course is designed to follow two years of language study and to prepare students for upper-division courses devoted exclusively to Russian literature.

#### Lit/Ru 140A. Survey of Russian Literature, Part I: 1800-1860 (4)

A study of literary works from Pushkin to the young Dostoevsky.

#### Lit/Ru 140B. Survey of Russian Literature, Part II: 1860-1917 (4)

A study of literary works from mid-nineteenth century to the Revolution.

#### Lit/Ru 141. Soviet Literature (4)

A study of literary works from the Soviet period. May be repeated for credit as topics vary.

#### Lit/Ru 142. Genres in Russian Literature (4)

An examination of one or more genres in Russian literature; for example, the novel, the short story, autobiography, drama, poetry. May be repeated for credit as topics vary.

#### Lit/Ru 143. Single Authors in Russian Literature (4)

A study of literary works by a single Russian author. May be repeated for credit when authors vary.

#### Lit/Ru 198. Directed Group Study (4)

Directed group study in areas of Russian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

#### Lit/Ru 199. Special Studies (2 or 4)

Tutorial; individual guided reading in areas of Russian literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## SPANISH LITERATURE

### Lower Division

### Language and Literature Courses

#### Lit/Sp 7. Introductory Intensive Spanish (8)

This course will offer highly intensive Spanish language instruction to beginning language students. The course will enable students to develop basic language skills, to include listening comprehension, speaking, reading and writing, through a total immersion approach, with a focus on the acquisition of language functions.

#### Lit/Sp 8. Intermediate Intensive Spanish (8)

This course will offer highly intensive Spanish language instruction to students previously enrolled in Spanish 7, the introductory intensive instruction class. The course will continue to develop language skills, concentrating more on the writing and academically oriented language functions.

#### Lit/Sp 10. Readings and Interpretations (4)

The course is entirely taught in the language of the literature concerned and emphasizes the development of reading ability, listening, comprehension, and writing skills. It includes grammar review, lectures, and class discussions. The course is designed to prepare students for Literature 25 and Literature 50. *Prerequisites: For information on prerequisites, contact the Undergraduate Office of the Department of Literature. Lit/Sp 10 satisfies the requirement for language proficiency in Revelle College.*

#### Lit/Sp 25. Composition and Conversation (4)

A course designed for students who wish to improve their ability to speak and write Spanish. It is a continuation of Lit/Sp 10, with special emphasis on problems in writing and interpretation. *Prerequisite: Lit/Sp 10 or consent of instructor.*

#### Lit/Sp 50. Readings in Spanish Literature and Culture (4)

An introduction to Spanish American literature. May be taken for three quarters, starting with any quarter. The instructor will advise students when they have achieved sufficient proficiency to proceed to upper-division courses which call for an ability to read extensive texts in Spanish. *Prerequisite: completion of Lit/Sp 25 or consent of instructor.*

### Upper Division

*Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.*

#### Lit/Sp 100. Major Works of the Middle Ages (4)

Major Spanish literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period. May be repeated for credit as topics vary.



**Lit/Sp 102. Topics in Medieval Poetry (4)**

Study of Spanish poetry from the eleventh to the fifteenth century. May be repeated for credit as topics vary.

**Lit/Sp 107. Literature of the Fifteenth Century (4)**

A concentrated study of the Spanish literature of the fifteenth century including the *Celestina*. May be repeated for credit as topics vary.

**Lit/Sp 110A-B. Major Works of the Renaissance and Baroque (4-4)**

A survey. Historical, but with close reading of the major (complete) texts of the sixteenth and seventeenth centuries. Garcilaso's poetry, *Lazarillo*, Fray Luis, San Juan, Quevedo, Góngora, Lope de Vega, Tirso de Molina, Calderon, Gracián. Cervantes will be read; but not the *Quijote*.

**Lit/Sp 111. Topics in Golden Age Poetry (4)**

A study of the thematic and stylistic evolution, from Garcilaso de la Vega to Góngora. Close textual reading of major poems.

**Lit/Sp 115. Topics in Golden Age Prose (Except Cervantes) (4)**

The topics may vary, as, for example: origins of the modern novel; the picaresque; romances of chivalry and the appearance of "realism," etc. May be repeated for credit as topics vary.

**Lit/Sp 117. Golden Age Drama (4)**

A close look at the major themes of the Golden Age drama, with special attention to the theater of Lope, Tirso and Calderon, "National" theatre, and the baroque.

**Lit/Sp 119. Cervantes (4)**

A close study of the *Quijote*. In alternate years Cervantes' other prose works and his theatre will be studied. (Required of all majors.)

**Lit/Sp 120. Major Works in the Modern Period: from Feijoo to Galdos (4)**

Survey of major figures and movements in Spanish literature from 1700-1880. The selection of works to be studied may vary from year to year, but will always be representative of the main literary and historical developments of this period.

**Lit/Sp 122. The Romantic Movement (4)**

The course will explore the historical context of the emergence of a romantic movement in Spain, particularly the links between romanticism and liberalism. Major romantic works in several genres will be studied in depth.

**Lit/Sp 124. The Nineteenth-Century Novel (4)**

Study of major novelists of the realist tradition. Selection of works and thematic focus may vary.

**Lit/Sp 125. The Generation of '98 (4)**

The course will explore the significant literary tendencies that arose during the crisis of Spanish society at the end of the nineteenth century and the beginning of the twentieth.

**Lit/Sp 127. Modern Drama (4)**

Study of significant developments in Spanish theatre of the nineteenth and twentieth century. Selection of works to be studied will vary at the discretion of the instructor.

**Lit/Sp 128. Modern Poetry (4)**

The course will consider major trends and figures in the development of Spanish poetry throughout the last two centuries. Topics may vary significantly in selection of poets and periods to be studied; thus, course may be repeated for credit when topics vary.

**Lit/Sp 129. Twentieth-Century Prose (4)**

The course will explore significant aspects of Spanish prose literature in this century. Specific topics will vary by genre (novel, short story, essay) and by period; may be repeated for credit when topics vary.

**Lit/Sp 130A. Development of Spanish Literature (4)**

An introduction to the major movements and periods of Spanish literary history, centered on close reading of representative texts, but aimed at providing a sense of the scope of Spanish literature and its relation to the course of Spain's cultural and social history. This course is required of all Spanish literature majors.

**Lit/Sp 130B. Development of Latin American Literature (4)**

An introduction to major movements and periods in Latin American literature, centered on a study of key works from pre-Columbian to the present time. Texts will be seen within their sociohistorical context and in relation to main artistic trends of the period. This course is required of all Spanish literature majors.

**Lit/Sp 131. Spanish American Literature: The Colonial Period (4)**

A study of the major literary works of the Latin American colonial period as seen against the historical context of that period.

**Lit/Sp 132. Spanish American Literature: The Nineteenth Century (4)**

A study of the major literary works and problems of the nineteenth century in Latin America as seen against the historical context of that period.

**Lit/Sp 133. Spanish American Literature: The Twentieth Century (4)**

A study of the major literary works and problems of the twentieth century in Latin America as seen against the historical context of that period.

**Lit/Sp 134. Argentine Literature (4)**

Study of movements, traditions, key authors, or major trends in Argentine literature, such as gaucho poetry, the realist novel, modern urban narrative, the school of Jorge Luis Borges. May be repeated for credit as topics vary.

**Lit/Sp 135. Mexican Literature (4)**

Study of popular novels, movements, traditions, key authors, or major trends in modern Mexican literature. May be repeated for credit as topics vary.

**Lit/Sp 136. Peruvian Literature (4)**

Study of movements, traditions, key authors, or major trends in Peruvian literature such as the romantic movement, the essay tradition, the rural narrative, the novel of national definition, postmodernist poetry authors such as Vallejo, Arqueadas, Vargas Llosa. May be repeated for credit as topics vary.

**Lit/Sp 137. Caribbean Literature (4)**

Study of movements, traditions, key authors, or major trends in Caribbean literature in Spanish, such as the romantic movement, the literature of independence, the essay tradition, Afro-Antillean literature, the historical novel. May be repeated for credit as topics vary.

**Lit/Sp 140. Spanish American Novel (4)**

A study in depth of selected novelists of Spanish America. May be organized around a specific theme or idea which is traced in its development through the narratives. Course may be repeated for credit when topics vary.

**Lit/Sp 141. Spanish American Poetry (4)**

A critical study of some of the major poets of Spanish America, focusing on the poet's central themes, the evolution of poetic style, and the significance of the poetry to the historical context. May be repeated as topics vary.

**Lit/Sp 142. Spanish American Short Story (4)**

Readings and interpretation of short story form in Latin America. Focus is primarily nineteenth or twentieth century. May be repeated for credit as topics vary.

**Lit/Sp 143. Spanish American Essay (4)**

A study of the essay in Spanish American literature from either an historical or a topical point of view. May be repeated for credit as topics vary.

**Lit/Sp 144. Spanish American Theatre (4)**

This course studies the representative plays of the major dramatists of Latin America. Discusses and analyzes the dramatic works in light of their historical, social, and cultural background. Considers their contribution to the development of a theatrical tradition in Latin America. May be repeated for credit as topics vary.

**Lit/Sp 150. The Development of Chicano Literature (4)**

A cross-genre survey of the major works in Chicano literature from its beginnings to the present, with primary emphasis on contemporary works. This course may be offered in English.

**Lit/Sp 151. Themes and Motifs in Chicano Literature (4)**

This course is organized around some of the significant themes and ideas expressed in specific Chicano writings. The importance of these themes to particular Chicano experience is considered.

**Lit/Sp 152. Chicano Prose (4)**

A study of the different genres of Chicano prose, essay, novel, short story, autobiography. Attention is given to the development of Chicano prose styles and the historical and cultural movement in which these forms develop.

**Lit/Sp 153. Chicano Poetry (4)**

The analysis and discussion of the major forms and modes of Chicano poetry, with primary emphasis on the developing styles of the poets and on the study of the texts' and the authors' historical moment.

**Lit/Sp 154. Chicano Theatre (4)**

This course provides students a meaningful definition of Chicano theatre through the discussion and interpretation of major dramatic works, both past and present.

**Lit/Sp 160. Spanish Phonetics (4)**

A comparative study of the English and Spanish phonetics systems. The course will include a study of the organs of articulation, manner of articulation, stress and intonation patterns, as well as dialectal variations in Spanish.

**Lit/Sp 161. Spanish Syntax and Morphology (4)**

An analysis of Spanish syntax and morphology to increase the student's ability to speak and write Spanish.

**Lit/Sp 162. Spanish Language in the United States (4)**

A sociolinguistic study of the popular dialects in the U.S.A. and their relation to other Latin American dialects. The course will cover phonological and syntactic differences between the dialects as well as the influence of English on the Southwest dialects.

**Lit/Sp 163. Spanish Language in America (4)**

A study of the history, structure, and peculiarities of the Spanish language in Latin America with selected readings from Latin American authors utilizing these dialects within their works.

**Lit/Sp 164. Language and Society (4)**

A comparison of language policy in Latin America and that of other Third World countries and its reflection in literature.

**Lit/Sp 165. History of the Spanish Language (4)**

Historical description of Spanish phonology, morphology, and syntax based on readings of the different periods.

**Lit/Sp 166. Creative Writing (4)**

A workshop designed to foster and encourage writing in Spanish of students working on short forms of fiction. The workshop will include discussion of techniques and intensive writing.

**Lit/Sp 170. Literary Criticism (4)**

Major contemporary critical theories and the question of their applicability to contemporary Latin American, Peninsular-Spanish, and/or Chicano literature.

**Lit/Sp 171. Studies in Literature and Society (4)**

Focus on interaction between literary expression and the study of society, covering issues such as the sociology of literature, the historical novel, literature and social change, the writer as intellectual. May be repeated for credit as topics vary.

**Lit/Sp 172. Indigenista Themes in Spanish American Literature (4)**

Study of the varying literary modes during the nineteenth and twentieth centuries by which poets and narrators have interpreted the themes of Andean survival in Latin America, primarily in Mexico and the Andean Highlands. May be repeated for credit as topics vary.

**Lit/Sp 173. Problems in Spanish and Spanish American Literary History (4)**

Study of the issues involved in understanding the development process of literary expression; the problem of genre; the relation of literature to social institutions; the function of literary influence and tradition; the relation of popular and print cultures. May be repeated for credit as topics vary.

## LITERATURE

### Lit/Sp 190. Seminars (4)

These seminars are devoted to a variety of special topics, including the works of single authors, genre studies, problems of literary history, relations between literature and the history of ideas, literary criticism, literature and society, and the like. The student may enroll in more than one seminar in a single quarter.

### Lit/Sp 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Gen 191. Oral Exam.

### Lit/Sp 198. Directed Group Study in Spanish Literature (4)

Research seminars and research, under the direction of a member of the staff. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

### Lit/Sp 199. Special Studies (2 or 4)

Tutorial: individual guided reading in areas of Spanish literature not normally covered in courses. May be repeated for credit three times. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

## Graduate

### Lit/Sp 201. Reading Medieval Texts (4)

Introduction to the reading of medieval Spanish. It will provide the student the linguistic and culture background necessary to go on to more work in depth in the medieval field. May be repeated for credit as topics vary.

### Lit/Sp 202. Spanish Language in America (4)

Selected topics on the history, structure, and peculiarities of the Spanish language in America. May be repeated for credit as topics vary.

### Lit/Sp 203. History of the Spanish Language (4)

Readings and discussion in the monographic literature of a selected topic.

### Lit/Sp 208. Textual Criticism in Spanish (4)

Tools and methods of scholarly research in literature for establishing texts from both manuscript and printed sources.

### Lit/Sp 214. Studies in Medieval Literature (4)

Consideration of one or more major figures, texts, trends, or problems in medieval Spanish literature.

### Lit/Sp 216. Fifteenth-Century Spanish Literature and Culture (4)

Consideration of one or more major figures, texts, trends, or problems in fifteenth-century Spanish literature. May be repeated for credit as topics vary.

### Lit/Sp 224. Golden Age Studies (4)

Consideration of one or more major figures, texts, trends, or problems in Spanish Golden Age studies. May be repeated for credit as topics vary.

### Lit/Sp 226. Cervantes (4)

A critical reading of the *Quijote*.

### Lit/Sp 231. Eighteenth-Century Spanish Literature (4)

Consideration of one or more major figures, texts, trends, or problems in eighteenth-century Spanish literature. May be repeated for credit as topics vary.

### Lit/Sp 252. Studies in Modern Hispanic Literature and Culture (4)

Major trends and figures considered in the context of late nineteenth- and twentieth-century Hispanic culture. May be repeated for credit as topics vary.

### Lit/Sp 253. Chicano Literature (4)

Study of the particular life experience of the Chicano and the unique expression given that experience by Chicano authors, whether in novels, short stories, poetry, or dramatic works. May be repeated for credit as topics vary.

### Lit/Sp 254. Modern Spanish Poetry (4)

An historical approach to modern Spanish poetry. May be repeated for credit as topics vary.

### Lit/Sp 255. The Modern Spanish Novel (4)

An historical approach to the modern Spanish novel. May be repeated for credit as topics vary.

### Lit/Sp 258. Spanish American Prose (4)

Consideration of one or more major figures, texts, trends, or problems in Spanish American prose. May be repeated for credit as topics vary.

### Lit/Sp 259. Spanish American Poetry (4)

Consideration of one or more major figures, texts, trends, or problems in Spanish American poetry. May be repeated for credit as topics vary.

### Lit/Sp 261. Studies in Spanish Linguistics (4)

A study of current linguistic and psycholinguistic theories and their application to Spanish. The course will focus on grammatical (syntactic and phonological) programs as well as on contemporary theoretical perspectives in the acquisition of language.

### Lit/Sp 264. Bilingualism and Bidialectalism: A Sociolinguistic Study (4)

A study of the relation between language production-reception and contextual factors. The course will examine current theories of language variation and problems of multilingual or bilingual societies determining language shift, maintenance, and standardization.

### Lit/Sp 266. Language Teaching: Theory and Methodology (4)

A study of theories of second language acquisition and methodologies proposed for the teaching of a second language, with particular focus on Spanish language instruction.

### Lit/Sp 271. Problems of Literary Analysis in Hispanic Literature (4)

Problems and approaches to literary theory in the context of Spanish and Spanish American literature. May be repeated for credit as topics vary.

### Lit/Sp 272. Literature and Society Studies (4)

Special topics in practical criticism involving social and economic historical perspectives. May be repeated for credit as topics vary.

### Lit/Sp 280. Field Work (4)

Techniques of on-the-spot linguistic and folkloric surveys including the practice of ballad collections in the Spanish Peninsula. Offered for repeated registration.

### Lit/Sp 281. Practicum in Literary Research and Criticism (4)

This course will focus on strategies for framing, organizing, and drafting projects in literary research. Students will learn and apply forms of argumentation and persuasion, as well as such technicalities as referencing systems, style sheets, and bibliographic techniques. May be repeated twice for credit as topics vary. (S/U grades only.)

### Lit/Sp 295. M.A. Thesis (1-8)

Research for the master's thesis. Open for repeated registration up to eight units. (S/U grades only.)

### Lit/Sp 296. Research Practicum (1-12)

Laboratory research on specific topics to be developed by a small group of students under the continued direction of individual faculty members. Offered for repeated registration.

### Lit/Sp 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of Spanish literature. Offered for repeated registration. (S/U grades only.)

### Lit/Sp 298. Special Projects (4)

Treatment of a special topic in Spanish literature. Offered for repeated registration. (S/U grades only.)

### Lit/Sp 299. Thesis (1-12)

Research for the dissertation. Offered for repeated registration. *Prerequisites: advancement to candidacy for the Ph.D. degree.* (S/U grades only.)

## WRITING/LITERATURE

### Lower Division

#### Lit/Writing 11. Fiction Workshop (4)

A workshop designed to expose students to new and traditional modes of fiction writing and/or creative prose. Occasionally a specific genre will be emphasized. Weekly presen-

tation and peer discussion of work in progress. Approximately 5,000-10,000 words required. *Prerequisite: completion of college writing requirement or equivalent.* May be taken for credit two times.

#### Lit/Writing 12. Poetry (4)

The emphasis in this course will be on the particular problems encountered in the writing of poetry and will include the study of some modern American poets. Weekly presentation and criticism of work will be required. *Prerequisite: completion of college writing requirement or equivalent.* May be taken for credit two times.

#### Lit/Writing 13. Research Writing (4)

This course will focus on a large-scale investigative project more complex than the average term paper. Research methods, modes of argument, and the various stages of construction of a large research project will be covered. *Prerequisite: completion of college writing requirement or equivalent.* May be taken for credit two times.

#### Lit/Writing 14. Technical Writing (4)

This course will deal with the writing of papers and reports suitable to the disciplines of science and engineering as well as problems encountered in writing for professional and/or popular audiences. Weekly presentation and criticism of work in progress will be required. *Prerequisite: completion of college writing requirement or equivalent.* May be taken for credit two times.

#### Lit/Writing 15. Journalism (4)

This course deals with the special demands of journalistic writing, with some consideration of the practical day-to-day experience of finding, researching, and writing up stories for a particular audience with strict deadlines. *Prerequisite: completion of college writing requirement or equivalent.* May be taken for credit two times.

#### Lit/Writing 16. Writing for Publication (4)

Emphasis will be on the practical business of finding a market and selling one's work. This course will include weekly presentation and criticism of work in progress. *Prerequisite: completion of college writing requirement or equivalent.* May be taken for credit two times.

#### Lit/Writing 17. Public Speaking (4)

Through lectures and practice, students gain an understanding of the principles of verbal and nonverbal communication, and develop the skills in organization and delivery necessary for the effective communication of ideas. *Prerequisite: consent of instructor.*

#### Lit/Writing 18. Advanced Public Speaking (4)

This course will focus on advanced topics in public speaking, including argumentation and debate, poetry reading, oral interpretation of literature, and impromptu speaking.

## Upper Division

### Prose Fiction, Drama, Poetry

#### Lit/Writing 100. Short Fiction (Beginning) (4)

A workshop for students with little previous experience writing prose fiction. This workshop is designed to encourage regular writing in the short forms of prose fiction and to permit beginning students to experiment with various forms. There will be discussion of student work together with analysis and discussion of the finest examples of short fiction from the present and previous ages. May be taken for credit two times.

#### Lit/Writing 101. Short Fiction (Advanced) (4)

A workshop for students with some experience and special interest in writing fiction. This workshop is designed to encourage regular writing in short forms of prose fiction. There will be discussion of student work together with analysis and discussion of the finest examples of short fiction from the present and previous ages. *Prerequisite: Lit/Writing 100 or consent of instructor.* May be taken for credit three times.

#### Lit/Writing 102. Poetry (Beginning) (4)

A workshop for students with little previous experience writing poetry. This workshop is designed to encourage regular writing of poetry and to permit beginning students to experiment with various forms. There will be discussion of student work together with analysis and discussion of the finest examples of poetry from the present and previous ages. May be taken for credit two times.

**Lit/Writing 103. Poetry (Advanced) (4)**

A workshop for students with some experience and special interest in writing poetry. This workshop is designed to encourage regular writing of poetry. There will be discussion of student work together with analysis and discussion of the finest examples of poetry from the present and previous ages. *Prerequisite: Lit/Writing 102 or consent of instructor.* May be taken for credit three times.

**Lit/Writing 104. The Novel (4)**

A workshop designed to encourage writing of longer narrative forms. There will be discussion of student work together with analysis and discussion of novels from the present and previous ages. May be taken for credit three times.

**Lit/Writing 105. Dramatic Writing (4)**

A workshop designed to encourage writing of stage plays, radio plays, and video or screen scripts. There will be discussion of student work together with analysis and discussion of the finest examples of dramatic writing from the present and previous ages. May be taken for credit three times.

**Lit/Writing 106. Translation of Literary Texts (4)**

The course centers on issues in the theory and practice of literary translation. Students should have reasonably good capability in at least one language other than their native language. Their primary task will be to translate several literary texts and discuss the versions with the instructor and other course members, and they will also do selected readings in translation theory and in published translations. May be taken for credit three times.

**Lit/Writing 107. General Fiction Workshop (4)**

A workshop in the writing of all forms of fiction. This workshop is usually limited to advanced students in the writing major. Students will pursue their own fiction-writing projects, discussing their work in progress with the instructor and other students. May be taken for credit three times.

**Lit/Writing 109. Creative Writing (4)**

A workshop designed to foster and encourage writing in Spanish of students working on short forms of fiction. The workshop will include discussions of techniques and intensive writing.

**Lit/Writing 111. Prose Poem (4)**

Although prose poems have been written by writers all over the world, the question of what constitutes a prose poem has never been adequately answered. Through practice, we will explore the inner dynamics central to this mixed genre.

**Lit/Writing 115. Experimental Writing (4)**

This workshop explores writing for which the traditional generic distinctions of prose/poetry, fiction/documentary, narrative/discourse do not apply. Students taking this course will be asked to challenge the boundaries of literature to discover new forms and modes of expression. May be taken for credit three times.

**Nonfiction Prose**

**Lit/Writing 120. Personal Narrative (4)**

A workshop designed to encourage regular writing of all forms of personal experience narrative, including journals, autobiography, firsthand biography, and firsthand chronicle. Instructor and students will discuss student work, as well as published personal narratives. May be taken for credit three times.

**Lit/Writing 121. Reportage (4)**

A workshop designed to encourage the full range of reportage writing: observations, interviews, case studies, profiles, reporter-at-large. Instructor and students will discuss student work and published reportage. May be taken for credit three times.

**Lit/Writing 122. Writing for the Sciences (4)**

A workshop in the writing of scientific or technical reports. Instructor and students will discuss student work, exploring the particular constraints and possibilities of science writing. May be taken for credit three times.

**Lit/Writing 123. Writing for the Social Sciences (4)**

A workshop in the writing of reports (reviews, analyses, field studies, surveys) in the social sciences. Instructor and students will discuss student work, exploring the particular constraints and possibilities of the various forms of social science writing. May be taken for credit three times.

**Lit/Writing 124. Writing Literary Criticism (4)**

A workshop designed to encourage regular writing of literary criticism, instructor and students will discuss student work. May be taken for credit three times.

**Lit/Writing 125. Persuasion (4)**

A workshop in the writing of argument or persuasion, with particular attention to strategies of persuasion for different kinds of audiences. Instructor and students will discuss student work, as well as published work. May be taken for credit three times.

**Lit/Writing 127. General Nonfiction Prose Workshop (2)**

A workshop designed to encourage the writing of all forms of nonfiction prose. This workshop is usually limited to advanced students in the writing major. May be taken for credit three times.

**Writing Process, Written Discourse, and Writing Pedagogy**

These courses are not writing workshop courses like those listed above. Rather, they examine various aspects of writing as a field of study and of writing pedagogy. Writing majors who plan to teach writing may be particularly interested in these courses. Students majoring in literature may count two of these courses toward the requirements in literature.

**Lit/Writing 140. History of Writing (4)**

A review of the history of the development of alphabets and writing systems. Survey of the rise of literacy since the fifteenth century and analysis of continuing literacy problems in developed and developing countries.

**Lit/Writing 141. The Process of Writing (4)**

A study of writing as a creative process. Review of research on creativity and on the writing process and analysis of writers' introspective accounts of their work. Delineation of the stages in writing process and exploration of implications for learning to write.

**Lit/Writing 142. Forms of Written Discourse (4)**

A review of current rhetorical theory and discourse theory. Some attention to recent developments in text linguistics. Students will write several discourse types and explore differences among the types, with special attention to differences for the writing process and for the structure of the written discourse itself.

**Lit/Writing 143. Stylistics and Grammar (4)**

A close look at sentence-level features of written discourse — stylistics and sentence grammars. Students will review recent research on these topics and experiment in their own writing with various stylistic and syntactic options.

**Lit/Writing 144. The Teaching of Writing (4)**

Wide reading in current theory and practice of teaching writing in schools and colleges. Careful attention to various models of classroom writing instruction and to different approaches in the individual conference. Students in this course may observe instruction in the UCSD college writing programs or tutor freshman students in those programs.

**Lit/Writing 145. Producing the Little Magazine (4)**

A practical course involving the actual production of a journal, includes study of the history of the little magazine and of editorial practices.

**Teaching Practica, Directed Study, and Special Study**

**Lit/Writing 193. Journal Writing Practicum (2)**

A seminar/workshop designed to assist students writing for campus publications. This seminar/workshop is generally restricted to those currently engaged (or about to be engaged) in producing material for current campus publications. In this seminar/workshop setting, student writing projects will be planned, evaluated, and discussed with emphasis upon publication. *Prerequisite: students writing (or about to write) for student publications.* May be taken for credit four times.

**Lit/Writing 196. Honors Thesis (4)**

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Gen 191. Oral exam.

**Lit/Writing 198. Directed Group Study (4)**

Directed group study in areas of writing not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.* May be taken for credit three times.

**Lit/Writing 199. Special Studies (2 or 4)**

Tutorial; individual guidance in areas of writing not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.* May be taken for credit three times.

**Graduate**

**Lit/Writing 271. Theory and Practice of College Writing Instruction (4)**

In this course we will explore the implications for writing instruction of current discourse theory and of linguistics (sentence-level and text-level). We will also review research on writing instruction and look carefully at several models of classroom instruction and individual conferencing.

**Lit/Writing 272. Research on Composing and Written Discourse (4)**

This course will survey current research and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process.

**Lit/Writing 273. Practicum on Research in Composing and Written Discourse (4)**

In this course students will design and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process.

**Lit/Writing 274. Classical and Medieval Rhetoric (4)**

This course will trace developments and philosophical perspectives in classical Greek and Roman rhetoric and in rhetoric in medieval Europe. The reading will include works of Plato, Aristotle, Cicero, Quintilian, Longinus, St. Augustine, and Geoffrey of Vinsauf.

**Lit/Writing 275. Rhetoric from 1500 to the Present (4)**

This course will begin with a brief review of the Greco-Roman background and proceed through the rhetorical theories of Erasmus, Ramus, Wilson, Sydney, and Bacon to the eighteenth century rhetoricians Vico, Blair, Campbell, and Whately. It will continue with Coleridge and DeQuincy in the nineteenth century and conclude with Kenneth Burke in the twentieth century. *Lit/Writing 274, although recommended, is not a prerequisite.*

**MATHEMATICS**

OFFICE: 7018 Applied Physics and Mathematics Building, Muir College

**Professors:**

- Donald W. Anderson, Ph.D.
- Randolph E. Bank, Ph.D.
- Edward A. Bender, Ph.D.
- James R. Bunch, Ph.D.
- Thomas J. Enright, Ph.D. (*Chairman*)
- John W. Evans, M.D., Ph.D.
- Jay P. Fillmore, Ph.D.
- Carl H. FitzGerald, Ph.D.
- Theodore T. Frankel, Ph.D.
- Michael H. Fredman, Ph.D.
- Michael H. Freedman, Ph.D.
- Adriano M. Garsia, Ph.D.
- Ronald K. Getoor, Ph.D.
- Leonard R. Haff, Ph.D.

## MATHEMATICS

Hubert Halkin, Ph.D.  
Richard S. Hamilton, Ph.D.  
J. William Helton, Ph.D.  
Janos Komlos, Ph.D.  
James P. Lin, Ph.D.  
Alfred B. Manaster, Ph.D.  
Richard A. Olshen, Ph.D.  
Jeffrey B. Remmel, Ph.D.  
John A. Rice, Ph.D. (*Vice Chairman*)  
Burton Rodin, Ph.D.  
Helmut Rohrl, Ph.D.  
Murray Rosenblatt, Ph.D.  
Linda Rothschild, Ph.D.  
Richard M. Schoen, Ph.D.  
Michael J. Sharpe, Ph.D.  
Lance W. Small, Ph.D.  
Donald R. Smith, Ph.D.  
Harold M. Stark, Ph.D.  
Audrey A. Terras, Ph.D.  
Adrian R. Wadsworth, Ph.D.  
Stefan E. Warschawski, Ph.D. (*Emeritus*)  
Stanley G. Williamson, Ph.D.  
Daniel E. Wulbert, Ph.D.  
Shing-Tung Yau, Ph.D.

### Associate Professors:

James Agler, Ph.D.  
Ronald J. Evans, Ph.D.  
Norman A. Shenk, Ph.D.  
John Wavrik, Ph.D.

### Lecturers in Mathematics:

Patrick J. Ledden, Ph.D.  
Frank B. Thiess, Ph.D.

### Assistant Professors:

Ian Abramson, Ph.D.  
Matthew Grayson, Ph.D.  
Ruth J. Williams, Ph.D.

The Department of Mathematics offers a wide range of courses and programs. These vary in their objectives and levels of required mathematical maturity. In certain courses, the cultural aspects of mathematics are emphasized, and the prerequisites are minimal. In others, the scientific and technical aspects are paramount, and the prerequisites are considerable. In making selections, students are advised to keep in mind their particular objectives and backgrounds.

## The Undergraduate Program

### First-Year Courses

During orientation, each freshman is given an examination to determine that student's level of mathematics preparation for the department's calculus courses. Before orientation, students should briefly review their mathematics so that their test performance accurately reflects their competence. The examination results will be used to assist the student in selecting a starting point in the mathemat-

ics program. Some students will be required to take precalculus courses before beginning a calculus sequence.

A course in college algebra is offered on the UCSD campus by a community college in cooperation with the department. This course is designed both for students who need a preparatory course before beginning the Mathematics 1 sequence and for students who plan to enroll in the Mathematics 2 sequence but need to strengthen their algebraic skills and facility in graphing and working with exponential and logarithmic functions before enrolling in Mathematics 4C. Mathematics 4C is the department's preparatory course for the Mathematics 2 sequence, providing a brief review of the material in the college algebra course followed by an introduction to trigonometry and a more advanced treatment of graphing and functions.

Mathematics 1A-B-C is one of two calculus sequences. The students in this course have completed a minimum of two years of high school mathematics. This course is acceptable for majors in liberal arts, economics, and biology. (It fulfills the mathematics requirements of Revelle College, and the option of the general-education requirements of Muir College. Completion of two quarters fulfills the requirement of Third College and the option of Warren College.)

Mathematics 2A-B-C is calculus. Most of the students have completed four years of high school mathematics. Many have previously taken short, introductory calculus courses. This sequence is required for certain majors including mathematics, physics, chemistry, and CSE. (It fulfills the same college requirements as Mathematics 1A-B-C.) Students with adequate backgrounds in mathematics are strongly encouraged to take Math. 2 since Math. 1 is inadequate preparation for many later courses in science and economics.

Students with exceptionally strong backgrounds in mathematics should consider advanced placement or the honors calculus sequence of 3C-D-E. The honors sequence 3C-D-E is especially recommended for entering students who have completed a full year of calculus in high school with excellent grades.

This sequence covers the material of the four courses 2C-D-E-F and is an ideal complement to the honors physics sequence, Physics 3A-B-C-D.

The courses 2DA and 2EA offer more methods of solution and less theory than the courses 2D and 2E. Students should be aware that most engineering majors re-

quire 2DA and 2EA. The course 2D or 2DA may be taken either before or after 2E or 2EA.

Certain transfers from one sequence to another are possible, but such transfers should be carefully discussed with an adviser. Able students, who begin the Mathematics 1 sequence and who wish to transfer to the Mathematics 2 sequence, may follow one of three paths, the first of which is highly recommended over the others:

- (i) Follow Math. 1A with Math. 2A with two units of credit given for Math. 2A. This option is not available if the student has credit for Math. 1B or Math. 1C. This option is available only if the student obtains a grade of A in Math. 1A.
- (ii) Follow Math. 1B with Math. 2B, receiving two units of credit for Math. 2B.
- (iii) Follow Math. 1C with Math. 2B, receiving two units of credit for Math. 2B and two units of credit for Math. 2C.

Credit will not be given for courses taken simultaneously from the Math. 1 and the Math. 2 sequence.

## Major Programs

The department offers four different majors: (1) mathematics, (2) applied mathematics, (3) applied mathematics (scientific programming), and (4) mathematics-computer science. The specific emphases and course requirements for these majors are described in the following sections. All majors must obtain a minimum 2.0 grade-point average in the upper-division courses used to satisfy the major requirements. Further, the student must receive a grade of C- or better in any course to be counted toward fulfillment of the major requirements. Any mathematics course numbered 100-199 may be used as an upper-division elective with the exception of 183 and 195. All courses used to fulfill the major must be taken for a letter grade.

## Major in Mathematics

The upper-division curriculum provides programs for mathematics majors as well as courses for students who will use mathematics as a tool in the physical and behavioral sciences and the humanities. Foreign languages recommended for mathematics majors are French, German, and Russian.

All students majoring in mathematics will complete the basic sequence 2A-B-C-D-E-F or 3C-D-E. Math. 2DA may replace Math. 2D and Math. 2EA may replace



Math. 2E. In addition the student must complete at least twelve one-quarter upper-division courses, which *must* include:

1. 140A-B
2. 100A-B or 103A-B
3. Two complete sequences from the following list: 100A-B-C, 103A-B-102, 104A-B-C, 110-120A-B, 111A-B, 110-130A-B, 110-132A-B, 140A-B-C, 150A-B-C, 160A-B, 170A-B-C, 171A-B, 180A-B-C, 180A-181A-B, 190-191.

As with all departmental requirements, more advanced courses on the same material may be substituted with written approval from the departmental adviser.

To be prepared for a strong major curriculum, students should complete Mathematics 2D(A)-2E(A) or 3D-E before the end of their sophomore year. Either Mathematics 140A-B or 100A-B (103A-B) should be taken during the junior year.

### Major in Applied Mathematics

A major in applied mathematics is also offered. The program is intended for students planning to work on the interface between mathematics and other fields. Students considering this major should obtain the department's pamphlet on applied mathematics.

All students majoring in applied mathematics are required to complete the following courses:

1. 2A-B-C-D-E-F (2DA may replace 2D, and 2EA may replace 2E), or 3C-D-E.
2. 71 (or 77 or CSE 62AB or CSE 65) or AMES 10.
3. CSE 64 or AMES 154 [students may satisfy (3.) by taking the 170A option in (5.)]
4. 183 or 181A
5. 102 or 170A
6. One of the following sequences: 100A-B, 140A-B, 180A-B-C, 180A-181A-B, or three courses from 170A-B-C-172-173.
7. Two\* additional sequences which may be chosen from the list (in 6.) above or the following list: 110-120A-130A, 111A-B, 120A-B, 130A-132A, 155A-B, 171A-B, 184A-B.

At least fifty-two upper-division units must be completed in mathematics except:

- (a) Up to twelve units may be outside the department in an approved applied mathematical area.
- (b) AMES 154 cannot be counted toward the fifty-two units.

To be prepared for a strong major curriculum, students should complete Mathematics 2D-E or 2DA-EA or 3D-E before the end of their sophomore year. One of the sequences in (6.) should be taken during the junior year.

### Major in Applied Mathematics (Scientific Programming)

This is a specialized applied mathematics program with a concentration in scientific programming, i.e., computer programming of scientific problems. The requirements are those of the applied mathematics major, with the additions:

1. Physics 1A-B-C, 2A-B-C, or 3A-B-C
2. The three sequences must be:
  - (a) 110-120A-130A or 110-172\*-132
  - (b) Three courses from 170A-B-C-172\*-173
  - (c) 171A-B

\*Note: If the sequence 110-172-132 is chosen, then Math. 172 cannot be used for the Math. 170A-B-C-172-173 option.

### Major in Mathematics — Computer Science

The program provides for a major in computer science within the Department of Mathematics. Graduates of this program will be mathematically oriented computer scientists who have specialized in the mathematical aspects and foundations of computer science or in the computer applications of mathematics.

The curriculum for the B.A. in mathematics-computer science requires thirty-six units of lower-division courses and sixty units of upper-division courses. Of these sixty units, fifty-six units are required courses and four units are elective courses. A 3.0 average in the courses in item #1 is required for students entering UCSD beginning fall 1985, and a 2.0 average in the courses in items #2-4 is required for admission to the major.

The detailed curriculum is given in the following list.

#### Required Courses:

1. 2A-B-C-D-E-F (Math. 2DA may replace Math. 2D and Math. 2EA may replace Math. 2E.)
2. AMES 10
3. One of 77, CSE 65, CSE 62A-B (Pascal), 71(C)
4. CSE 70
5. 103A-B (100A-B may be substituted)
6. Math 184A

7. 176A and 186A
8. 166A
9. 167
10. 188
11. One of the two areas of concentration:
  - I. Numerical Computing
    - a) 170A
    - b) Three one-quarter courses chosen from: 170B, 170C, 172, 173
    - c) Two additional one-quarter courses from: 102, 110, 111A-B-C, 171A-B, 130A-B, 131, 132A-B, 180 A-B-C, 181A-B, 183, 185
    - d) One elective
  - II. Non-Numerical Computing
    - a) 174 and one from: 170A-B-C, 172, 173
    - b) 189A-B
    - c) Two from: 176B, 186B, 179A-B, 155A-B, 184B, 166B, 168A-B, 187, 189C, 160A-B, EECS 170A-B, EECS 171A-B, EECS 173
    - d) One elective

Credit will not be given for both:  
Math. 166 and CSE 165

|        |        |
|--------|--------|
| 176A-B | 161A-B |
| 184A-B | 160A-B |
| 155A-B | 177    |
| 179A-B | 178A-B |
| 189A-B | 163A-B |
| 188    | 179    |

\*Due to the high demand for CSE courses, particularly at the upper-division level, application for entry into these courses is required. After specific course prerequisites have been completed, admission is granted on the basis of GPA ranking in prerequisite courses at the time of application.

### Minor in Mathematics

The minor in mathematics (for all colleges) consists of a total of six or more courses, taken from the UCSD mathematics department, of which at least three are upper-division courses. Acceptable lower-division courses are: Math. 2D (or 2DA or 3D), 2E (or 2EA or 3E), and 2F (or 3C). At least two of the upper-division courses must be from a single sequence as described for the mathematics, applied mathematics, or mathematics-computer science major (excluding Math. 183 and 195).

For a class to count toward the minor, a



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grade of C or better (or P if the Pass/Not Pass option is used), is obligatory. There is no restriction on the number of classes taken with the P/NP option.

### Duplication of Credit

In the circumstances listed below, a student will not receive full credit for a Department of Mathematics course. The notation "Math. 2A [2 if Math. 1A previously/0 if Math. 1A concurrently/0 if Math 1B or 1C]" means that a student already having credit for Math 1A will receive only two units of credit for Math. 2A, but will receive no units if he/or she has credit for Math. 1B or 1C, and no credit will be awarded for Math. 2A if Math. 1A is being taken concurrently.

- (a) Math. 2A [2 if Math. 1A previously/0 if Math 1A concurrently/0 if Math. 1B or 1C]
- (b) Math. 2B [2 if Math 1B or 1C previously/0 if Math 1B concurrently]
- (c) Math. 2C [2 if Math 1C previously/0 if Math 1C concurrently]
- (d) Math. 103A-B [0 if Math. 100A-B]
- (e) Math. 155A [0 if CSE 177]
- (f) Math. 176A-B [0 if CSE 161A-B]
- (g) Math. 179A-B [0 if CSE 178A-B]
- (h) Math. 180A [2 if Econ. 120A or Math 183 previously/0 if Econ. 120A or Math 183 concurrently]
- (i) Math. 181A [2 if Econ. 120A-B/4 if Econ 120A only]
- (j) Math. 184A-B [0 if CSE 160A-B]
- (k) Math. 188 [0 if CSE 179]
- (l) Math. 189A-B [0 if CSE 163A-B]

### Advisers

Advisers change yearly. Contact the undergraduate office at (619) 534-3590 for the current list.

### The Graduate Program

The Department of Mathematics offers a graduate program leading to the M.A., M.S., and Ph.D. degrees.

Admission to the graduate program is in accordance with the general requirements of the Graduate Division of the University of California. Students with a bachelor's degree and background in mathematics comparable to the requirements for the undergraduate major in mathematics at this university may apply for admission. Excepting applicants for the master's degree who do not require financial support, all applicants must present satisfactory scores on the Graduate Record Examination, including the advanced examination in mathematics.

In each quarter, a student's program

must include at least twelve units. At least eight of these units must be in graduate mathematics courses. The remaining four units must be in upper-division or graduate courses in mathematics-related subjects or in Mathematics 501. Mathematics 500, Apprentice Teaching, may not be used to satisfy any part of this requirement. Mathematics 299, Reading and Research, may only be used by students in the Ph.D. program who have passed both written qualifying examinations (see "Doctoral Degree Program") or who have obtained the approval of the graduate adviser.

### MASTER'S DEGREE PROGRAM

Requirements for the master of arts degree are to be met according to Plan II (Comprehensive Examination). (See "Graduate Studies: The Master's Degree.") A total of forty-eight units of course credit is required.

This must include:

1. At least twenty-four of graduate mathematics courses.
2. Not more than nine units of upper-division mathematics courses.
3. Not more than twelve units of graduate courses in a related field approved by the department.
4. Not more than a total of four units of Mathematics 500, Apprentice Teaching, or Math. 295. No units of Mathematics 299 may be used in satisfying the requirements for the master's degree; Mathematics 500 may not be used under item 1. Mathematics 501 may be used under item 2.

The comprehensive examination will cover basic facts in two topics, one from each group:

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1. Algebra or applied algebra or topology.
2. Real analysis or complex analysis.

A detailed list of the depth requirements in each of these areas, with literature references and approved courses, is available in the office of the Department of Mathematics.

A reading knowledge of one foreign language: French, German, or Russian, is required. (In exceptional cases other languages may be substituted.) The foreign language examinations, which consist of the translation of selected passages in mathematics, are administered by the department.

Full-time M.A. students are permitted

seven quarters in which to complete all requirements.

### Master's Degree Program in Applied Mathematics

The Department of Mathematics also offers a program of graduate studies in applied mathematics for regular or part-time students. The program requires one to two years for completion. A total of forty-eight units of course credit is required. These must include at least thirty-two units of graduate work, of which at least twenty-four must be graduate courses in mathematics. The remaining required units may be composed of:

1. Approved graduate courses in other departments.
2. No more than eight units of upper-division mathematics courses or Mathematics 501.
3. No more than eight units of approved upper-division courses in other departments.
4. No more than four units of Mathematics 500 (which cannot be used to satisfy graduate course unit requirements).

No units of Mathematics 299 or 295 may be used to satisfy the M.A. requirements. There is no foreign language requirement, and a thesis is not required. Students must take two sequences and pass two qualifying exams (at the M.A. level) from the following applied mathematics courses: 202A-B-C, 210A-B-C, 211A-B, 261A-B-C, 264A-B-C, 270A-B-C, 271A-B-C, 272A-B-C, 277A-B-C, 282A-B, 284A-B-C. (Not every course is offered each year.) In addition, students are encouraged to take a one-year graduate sequence in a related area outside the Department of Mathematics (e.g., computer science, engineering, physics, economics). Full-time M.A. students are permitted seven quarters in which to complete all requirements.

### Master's Degree Program in Statistics

The program leading to the M.S. in statistics at UCSD was designed on the premise that students need strong mathematical backgrounds, plus exposure to statistical computing and serious applications. Courses in mathematical and applied statistics, and in probability and stochastic processes, are offered. The curriculum includes multivariate analysis, nonparametric statistics, time series, sequential analysis, and numerical analysis.

Some courses entail computing on a VAX 11/780. Students in the M.S. program are encouraged to broaden their horizons by studying substantive material in other disciplines.

Mathematics 281A-B, 282A-B, and two of the topics given in 287A-B-C-D are required. For the applied orientation 270A-B-C is suggested, while 280A-B-C is required for a theoretical emphasis. Students are encouraged to take courses in other departments which apply statistical and probabilistic concepts.

A total of forty-eight units of course credit are required. A maximum of twenty-four of these units may come from approved graduate courses outside the Department of Mathematics. At most, eight units as a combined total may come from the following: Mathematics 500, undergraduate upper-division courses in applied mathematics approved by departmental advisers.

Each student must pass, at the master's level, two written comprehensive examinations offered by the Department of Mathematics and approved by departmental advisers as related to the student's studies in statistics.

## DOCTORAL DEGREE PROGRAM

A student acquires a general background in mathematics by preparing for and taking written departmental qualifying examinations in two areas. One of the two areas must be real analysis or complex analysis, another must be algebra or applied algebra or topology. There is a third requirement which depends on the student's area of study; see the faculty adviser. The examinations are given near the beginning and end of each academic year. A detailed list of depth requirements in each area, with literature requirements in each area, with literature references and approved courses, is available in the office of the Department of Mathematics. Examinations may be repeated, but no more than four attempts are allowed to pass the examinations in the two areas.

Students in the Ph.D. program must pass both written qualifying examinations by the September examination session following the second full academic year of study, and the area requirement must be fulfilled by September following the third year. Students in the Ph.D. program who do not pass written qualifying examinations according to the above schedule will be transferred to an M.A. program in mathematics.

Students originally admitted to the mas-

ter's program who wish to transfer to the Ph.D. program later will be evaluated in comparison to current year applicant pool. Previous passage of qualifying exams at the Ph.D. level is not sufficient for admission to the Ph.D. program.

A student must demonstrate a satisfactory reading knowledge of two foreign languages (chosen from French, German, and Russian; in exceptional circumstances other languages may be substituted.)

After a student has met the area and language requirements and has decided upon a field of research under the supervision of a faculty member, a doctoral committee appointed by the Office of Graduate Studies and Research conducts the student's oral qualifying examination. This examination deals primarily with the proposed area of thesis research and may include the project itself. A student must pass this examination by the end of his or her eleventh quarter. Successful completion of this requirement advances the student to candidacy. The student then concentrates on courses and research related to completion of a doctoral dissertation. After completion of the research and dissertation, the student takes a final oral examination on the dissertation.

## Courses

All prerequisites listed below may be replaced by an equivalent or higher-level course. Quarters noted are subject to change. Please consult the Department of Mathematics for appropriate planning.

### Lower Division

#### 1A. Elements of Mathematical Analysis (4)

Differentiation and integration of algebraic functions. Fundamental theorem of calculus. Applications. Three lectures, two recitations. (Credit not given if Mathematics 2A previously completed.) Three lectures, two recitations. *Prerequisites: passing score on placement examination and either two or more units of high school mathematics or equivalent. One-half unit of trigonometry is desirable.* (F,W,S)

#### 1B. Elements of Mathematical Analysis (4)

Further applications of the definite integral. Calculus of trigonometric, logarithmic, and exponential functions. Complex numbers. (Credit not given if Mathematics 2B previously completed.) Three lectures, two recitations. *Prerequisite: Math. 1A.* (F,W,S)

#### 1C. Elements of Mathematical Analysis (4)

Vector geometry, velocity and acceleration vectors. Partial derivatives, multiple integrals. Exact differentials. (Credit not given if Mathematics 2C previously completed.) Three lectures, two recitations. *Prerequisite: Math. 1B.* (F,W,S)

#### 2A. Calculus and Analytic Geometry (4)

Differential and integral calculus of functions of one variable: limits, continuity; differentiation of algebraic and trigonometric functions; applications. Definite integral, primitive functions, fundamental theorem of the calculus. Elements of analytic geometry as needed in the development of the calculus. Three lectures, two recitations. *Prerequisites: passing score*

*on placement examination and either three or more units of high school mathematics or Math. 4C. With a superior performance in Math. 4C no placement examination is required; one-half unit of trigonometry is desirable.* (F,W,S)

#### 2B. Calculus and Analytic Geometry (4)

Applications of the definite integral, calculus of logarithmic, exponential, and hyperbolic functions. Maclaurin series for exponential and trigonometric functions. Methods of integration. Separable differential equations. Conic sections. Three lectures, one recitation. *Prerequisite: Math. 2A.* (F,W,S)

#### 2C. Calculus and Analytic Geometry (4)

Vector geometry, vector functions and their derivatives. Partial differentiation. Maxima and minima. Double integration. Three lectures, one recitation. *Prerequisite: Math. 2B.* (F,W,S)

#### 2D. Introduction to Differential Equations (4)

Infinite series. Ordinary differential equations. Three lectures, one recitation. *Prerequisite: Math. 2C or 3C.* (Not offered in 1987-88.)

#### 2DA. Introduction to Differential Equations (4)

Infinite sequences and series. Ordinary linear differential equations: initial, boundary-value and eigenvalue problems for single equations and for two equations with two unknowns. Laplace transform methods. Applications are directed towards the physical and engineering sciences. Credit not offered for both Math. 2D and Math. 2DA, three lectures, two recitations. *Prerequisite: Math. 2C or 3C.* (F,W,S)

#### 2DS. Applications of Differential Equations (4)

A supplementary course to 2D and 2DA in which differential equations are applied to problems in the sciences, engineering, and industry. This course is intended to increase the student's grasp of differential equations and awareness of their uses. One lecture, one recitation. *Prerequisites: Math. 2D or 2DA or 3D or concurrent enrollment, a knowledge of programming.* (Not offered in 1987-88.)

#### 2E. Matrices and Linear Transformations (4)

Linear equations, matrices, vector spaces, linear transformations, determinants, eigenvalues, orthogonal and unitary transformations, quadratic forms. Systems of differential equations, exponential of a matrix. Three lectures, two recitations. *Prerequisite: Math. 2C or 3C.* (Not offered in 1987-88.)

#### 2EA. Introduction to Linear Algebra (4)

Matrix operations, solutions to  $m$  linear algebraic equations in  $n$  unknowns, linear vector spaces, determinants, matrix eigenvalue problems, multiple eigenvalues, orthonormalization and expansions in orthonormal bases, orthogonal matrices, quadratic and positive-definite forms, simultaneous diagonalization, variational and iterative methods. Applications are directed towards the physical and engineering sciences. Credit not offered for both Math. 2E and Math. 2EA. Three lectures, two recitations. *Prerequisite: Math. 2C or 3C.* (F,W,S)

#### 2ES. Applications of Linear Algebra (2)

A supplementary course to 2E and 2EA in which linear algebra is applied to problems in the sciences, engineering, and industry. This course is intended to increase the student's grasp of linear algebra and awareness of its uses. One lecture, one recitation. *Prerequisites: Math. 2E or 2EA or 3E or concurrent enrollment, a knowledge of programming.* (W)

#### 2F. Calculus of Functions of Several Variables (4)

Calculus of vector functions with use of linear algebra. Matrix formulation of the chain rule and the second derivative test for critical points of a function of several variables. Jacobian determinants and change of variables in a multiple integral. Vector fields, line and surface integrals. Stokes' theorem and the divergence theorem. Selected applications. (Cannot be taken for credit after 3C.) Three lectures, one recitation. *Prerequisite: Math. 2E.* (F,W,S)

#### 3C. Honors Calculus (4)

An honors course covering the material of both 2C and 2F. Assigned problems will be more difficult. Completion of 3C will allow the student to enroll in any course having 2C and/or 2F as prerequisite. The Mathematics 3C-D-E sequence coordinates very well with the Physics 3 sequence. Three lectures, two recitations. *Prerequisites: one year high school calculus with excellent grades and consent of department.* (F)

#### 3D. Honors Calculus (4)

An honors course covering the material of 2D and 2DA. Assigned problems will be more difficult. Completion of 3D will

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allow the student to enroll in any course having 2D or 2DA as prerequisites. The Mathematics 3C-D-E sequence coordinates very well with the Physics 3 sequence. Three lectures, two recitations. *Prerequisite: Math. 3C. (W)*

### 3E. Honors Calculus (4)

An honors course covering the material of 2E and 2EA. Assigned problems will be more difficult. Completion of 3E will allow the student to enroll in any course having 2E or 2EA as prerequisites. The Mathematics 3C-D-E sequence coordinates very well with the Physics 3 sequence. Three lectures, two recitations. *Prerequisite: Math. 3D. (S)*

### 4C. Elementary Functions (4)

Review of polynomials. Graphing functions and relations: graphing rational functions, effects of linear changes of coordinates. Circular functions and right triangle trigonometry. Reinforcement of function concept: exponential, logarithmic, and trigonometric functions. Vectors. Conic sections. Polar coordinates. Three lectures, one recitation. *Prerequisite: qualifying score on placement examination. With a superior performance in the community college algebra course offered on the UCSD campus, the placement examination requirement may be waived. (Cannot be taken for credit after Math. 1 or Math. 2) (F,W,S)*

### 71. Elements of Computer Programming (4)

Introduction to computer programming and algorithm design. Structured programming and problem solving are emphasized within the study of the C programming language. Topics covered will include structures, pointers, recursion, backtracking, etc. Three lectures, one recitation and approximately eight laboratory hours per week. *Prerequisite: Math. 2C or consent of instructor. (F,W,S)*

### 74. Scientific Application of Computers (4)

Introduction to elementary numerical analysis with emphasis on computer applications. Systems of linear equations, interpolation, extrapolation, polynomial fits to data, root finding, numerical differentiation, and integration. Three lectures, one recitation. (Credit not offered for both Math. 74 and CSE 64.) *Prerequisites: Math. 2B and CSE 61 or 65 or equivalent course emphasizing structured programming approved by the instructor. (Not offered in 1987-88.)*

### 77. Pascal Programming (4)

An introduction to the PASCAL programming language which uses as a vehicle some of the most basic combinatorial algorithms that have arisen in mathematics and computer science. These include: sorting algorithms, backtracking, network algorithms, the Robinson-Schenstead Correspondence, the alternating path algorithm, the augmenting flow algorithms. Topics include problem solving techniques, structured programming, and some elements of data structures. Credit not offered for both Math. 77 and CSE 62A-B or 65. *Prerequisites: Math. 2A-B-C or consent of instructor. (F,W)*

## Upper Division

### 100A-B-C. Introduction to Algebra (4-4-4)

An introduction to the methods and basic structures of higher algebra: sets and mappings, the integers, rational, real and complex numbers, groups, rings (especially polynomial rings) and ideals, fields, real and complex vector spaces, linear transformations, inner product spaces, matrices, triangular form, diagonalization. Both 100 and 103 cannot be taken for credit. Three lectures, one recitation. *Prerequisite: Math. 2E or 3E. (F,W,S)*

### 102. Applied Linear Algebra (4)

A second course in linear algebra from a computational yet geometric point of view. Elementary Hermitian matrices, Schur's theorem, normal matrices and quadratic forms. Moore-Pinrose generalized inverse and least square problems. Vector and matrix norms. Characteristic and singular values. Canonical forms. Determinants and multilinear algebra. Three lectures, one recitation. *Prerequisite: Math. 2E or 3E. (S)*

### 103A-B. Modern Applied Algebra (4-4)

Abstract algebra with applications to computation. Set algebra and graph theory. Finite state machines. Boolean algebras and switching theory. Lattices. Groups, rings and fields: applications to coding theory. Recurrent sequences. Three lectures, one recitation. Both 100 and 103 cannot be taken for credit. *Prerequisite: Math. 2E or 3E. (F,W)*

### 104A-B-C. Number Theory (4-4-4)

Topics from number theory with applications and computing. Possible topics are: congruences, reciprocity laws, quadratic forms, prime number theorem, Riemann zeta function, Fermat's conjecture, diophantine equations, Gaussian sums, algebraic integers, unique factorization into prime ideals in algebraic number fields, class number, units, splitting of prime ideals in extensions, quadratic and cyclotomic fields, partitions. Possible applications are: Fast Fourier Transform, signal processing, coding, cryptography. Three lectures. *Prerequisite: consent of instructor. (Not offered in 1987-88.)*

### 108. Problem Solving (4)

Development of topics in algebra, geometry, probability, combinatorics, number theory, etc., as needed for solving nonroutine problems. May be repeated for credit. Three lectures. *Prerequisite: GPA better than 3.5 in Math. 2A-2E or consent of instructor. (F)*

### 110. Introduction to Partial Differential Equations (4)

Fourier series, orthogonal expansions, and eigenvalue problems. Sturm-Liouville theory. Some partial differential equations of mathematical physics. Boundary value problems and separation of variables. Three lectures, one recitation. *Prerequisites: Math. 2C-D-E or 3C-D-E or consent of instructor. (F,W,S)*

### 111A. Mathematical Model Building (4)

Analytic techniques and simulation methods will be used to study a variety of models. Students will work on independent projects. Three lectures. *Prerequisites: Math. 2D(A) and 2E(A). (Not offered in 1987-88.)*

### 111B. Mathematical Model Building (4)

Analytic techniques and simulation methods will be used to study a variety of models. Students will work on independent projects. Three lectures. *Prerequisites: Math. 2D(A) and programming ability (any course). (Not offered in 1987-88.)*

### 111C. Mathematical Model Building (4)

Analytic techniques and simulation methods will be used to study a variety of models. Students will work on independent projects. Three lectures. *Prerequisite: Math. 111A or 111B. (Not offered in 1987-88.)*

### 120A. Elements of Complex Analysis (4)

Complex numbers and functions. Analytic functions, harmonic functions, elementary conformal mappings. Complex integration. Power series. Cauchy's theorem. Cauchy's formula. Residue theorem. Three lectures, one recitation. *Prerequisites or co-registration: Math. 2C-D or 3C-D. (F,W)*

### 120B. Applied Complex Analysis (4)

Applications of the Residue theorem. Conformal mapping and applications to potential theory, flows, and temperature distributions. Fourier transformations. Laplace transformations, and applications to integral and differential equations. Selected topics such as Poisson's formula. Dirichlet problem. Neumann's problem, or special functions. Three lectures, one recitation. *Prerequisite: Math. 120A. (W,S)*

### 130A. Ordinary Differential Equations (4)

Linear and nonlinear systems of differential equations. Stability theory, perturbation theory. Applications and introduction to numerical solutions. Three lectures. *Prerequisites: Math. 2C-D-E or 3C-D-E. (F)*

### 130B. Ordinary Differential Equations (4)

Existence and uniqueness of solutions to differential equations. Local and global theorems of continuity and differentiability. Three lectures. *Prerequisites: Math. 2C-D-E or 3C-D-E, and Math. 130A. (Not offered in 1987-88.)*

### 131. Variational Methods in Optimization (4)

Maximum-minimum problems. Normed vector spaces, functionals, Gateaux variations. Euler-Lagrange multiplier theorem for an extremum with constraints. Calculus of variations via the multiplier theorem. Applications may be taken from a variety of areas such as the following: applied mechanics; elasticity; economics; production planning and resource allocation; astronautics; rocket control; physics; Fermat's principle and Hamilton's principle; geometry; geodesic curves; control theory; elementary bang-bang problems. Three lectures, one recitation. *Prerequisites: Math. 2D-E or 3D-E or consent of instructor. (S)*

### 132A. Elements of Partial Differential Equations and Integral Equations (4)

Basic concepts and classification of partial differential equations. First order equations, characteristics. Hamilton-Jacobi

theory, Laplace's equation, wave equation, heat equation. Separation of variables, eigenfunction expansions, existence and uniqueness of solutions. Three lectures. *Prerequisite: Math. 110 or consent of instructor. (W)*

### 132B. Elements of Partial Differential Equations and Integral Equations (4)

Relation between differential and integral equations, some classical integral equations, Volterra integral equations, integral equations of the second kind, degenerate kernels, Fredholm alternative, Neumann-Liouville series, the resolvent kernel. Three lectures. *Prerequisite: Math. 132A. (S)*

### 140A-B-C. Foundations of Analysis (4-4-4)

Axioms, the real number system, topology of the real line, metric spaces, continuous functions, sequences of functions, differentiation, Riemann-Stieltjes integration, partial differentiation, multiple integration, Jacobians. Additional topics at the discretion of the instructor: power series, Fourier series, successive approximations of other infinite processes. Three lectures, one recitation. *Prerequisites: Math. 2C-D, or 3C-D. (F,W,S)*

### 141. Introduction to Abstract Analysis (4)

General topological spaces, compactness, separation, locally compact Hausdorff spaces, metrization, completeness, Baire category, Stone-Weierstrass theorem, function spaces. Three lectures. *Prerequisites: Math. 140A-B or equivalent. (Not offered in 1987-88.)*

### 150A. Differential Geometry (4)

Differential geometry of curves and surfaces. Gauss and mean curvatures, geodesics, parallel displacement, Gauss-Bonnet theorem. Three lectures. *Prerequisites: Math. 2F or 3C-D-E or consent of instructor. (F)*

### 150B-C. Calculus on Manifolds (4-4)

Calculus of functions of several variables, inverse function theorem. Further topics, selected by instructor, such as exterior differential forms, Stokes' theorem, manifolds, Sard's theorem, elements of differential topology, singularities of maps, catastrophes, further topics in differential geometry, topics in geometry of physics. Three lectures. *Prerequisite: Math. 150A. (W)*

### 151. Topics in Geometry (4)

A topic, selected by the instructor, from Euclidean geometry, non-Euclidean geometry, projective geometry, algebraic geometry, or other geometries. May be repeated for credit with a different topic. Three lectures. *Prerequisite: consent of instructor. (S)*

### 155A. Computer Graphics (4)

Overview of computer graphics. Drawing and transformations of points and lines, clipping and windowing, display files, plane curves, three-dimensional graphics, hidden surfaces. Introduction to graphics packages and interactive graphics. Three lectures, one recitation, and approximately eight laboratory hours per week. *Prerequisites: Math. 2E or equivalent and programming experience. [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (F,W,S)*

### 155B. Topics in Computer Graphics (4)

Special mathematical topics relevant to computer graphics. Topics may include: three-dimensional transformations and projections, surface description and generation, hidden lines and surfaces, among others. Three lectures, one recitation, and approximately eight laboratory hours per week. *Prerequisite: Math. 155A or consent of instructor. (W,S)*

### 160A-B-C. Elementary Mathematical Logic (4-4-4)

An introduction to recursion theory, set theory, proof theory, and model theory. Turing machines. Undecidability of arithmetic and predicate logic. Proof by induction and definition by recursion. Cardinal and ordinal numbers. Completeness and compactness theorems for propositional and predicate calculi. Three lectures. *Prerequisite: Math. 100A, 103A, 140A, or consent of instructor. (Not offered in 1987-88.)*

### 163. History of Mathematics (4)

The course will be taught from the original sources in translation, starting from Babylonian times to 1800 A.D. The unifying themes will be the histories of algebra and analysis. Half of the lecture will be actual mathematics of the times. Three lectures, one recitation. *Prerequisite: Math. 1C or 2B or consent of instructor. (S)*

### 165. Introduction to Set Theory (4)

Sets, relations, and function. Partial, linear, and well-orders.

The Axiom of Choice, proof by induction and definition by recursion. Cardinal and ordinal numbers and their arithmetic. *Prerequisite: Math. 100A or 140A or 103A, or consent of instructor.* (S)

**166A-B. Theory of Computability (4-4)**

An introduction to the mathematical theory of computability including formal treatment. Finite automata and regular expressions. Context-free languages and push-down automata. Turing machines and recursive functions. Church's thesis. Unsolvability problems. Further topics selected from computational complexity, arithmetical relations, word problems. Credit not offered for both Math. 166A and CSE 165. Three lectures, one recitation. *Prerequisite: Math. 103A or 100A or consent of instructor.* (F,S)

**167. Probabilistic Methods in Computer Science (4)**

This course introduces the probability tools used in the analysis of algorithms. Probability spaces, random variables and stochastic processes. The laws of large numbers. Characteristic functions and the Central Limit Theorem. Moment generating functions and large deviation. Branching processes and random graphs. Coding, entropy, and information. Three lectures, one recitation. *Prerequisite: Math. 184A or consent of instructor.* (W)

**168A-B. Topics in Applied Mathematics-Computer Science (4-4)**

Topics to be chosen in areas of applied mathematics and mathematical aspects of computer science. May be repeated once for credit with different topics. Three lectures. *Prerequisite: consent of instructor.* (W,S)

**170A. Numerical Linear Algebra (4)**

Analysis of numerical methods for linear algebraic systems and least squares problems. Orthogonalization methods. Ill-conditioned problems. Eigenvalue and singular value computations. Statistical computations. Linear programming. Three lectures, one recitation. *Prerequisites: Math. 2E or 2EA or 3E and knowledge of programming.* (F)

**170B. Numerical Analysis (4)**

Rounding and discretization errors. Calculation of roots of polynomials and nonlinear equations. Interpolation. Approximation of functions. Three lectures, one recitation. *Prerequisites: Math. 2E or 2EA or 3E and knowledge of programming.* (W)

**170C. Numerical Ordinary Differential Equations (4)**

Ordinary differential equations and their numerical solution. Basic existence and stability theory. Difference equations, numerical methods and error propagation. Boundary value problems. Three lectures, one recitation. *Prerequisites: Math. 2E or 2EA or 3E and knowledge of programming.* (S)

**171A-B. Mathematical Programming (4-4)**

Mathematical optimization and applications. Linear programming, the simplex method, duality. Nonlinear programming, Kuhn-Tucker theorem. Selected topics from integer programming, network flows, transportation problems, inventory problems, and other applications. Three lectures. (Credit not offered for both Math. 171A-B and Econ. 172A-B.) *Prerequisites: Math. 2C-D-E or 3C-D-E.* (W,S)

**172. Numerical Partial Differential Equations (4)**

Finite difference methods for the numerical solution of hyperbolic and parabolic partial differential equations; finite difference and finite element methods for elliptic partial differential equations. Three lectures. *Prerequisites: Math. 170A or Math. 110 and programming experience.* (W)

**173. Mathematical Software — Scientific Programming (4)**

Development of high quality mathematical software for the computer solution of mathematical problems. Three lectures, one recitation. *Prerequisites: Math. 170A and knowledge of FORTRAN.* (Not offered in 1987-88.)

**174. Numerical Methods in Science and Engineering (4)**

Floating point arithmetic, linear equations, interpolation, integration, ordinary differential equations, nonlinear equations, optimization, least squares. Three lectures and one recitation. *Prerequisites: Math. 2E (2EA) and knowledge of FORTRAN.* (F)

**175. Elements of Computer Programming (4)**

Renumbered. See Math. 71.

**176A-B. Computer Implementations of Data Structures (4-4)**

Introduction to the use of data structures in computer implementation of combinatorial algorithms. This course is designed to give students hands-on experience with these fundamental tools of computer science. Part A covers dictionaries, heaps, priority queues, hashing structures, balanced and self-adjusting trees. Part B includes selected applications to sorting, searching, string processing, elementary parsing, geometric and graph algorithms. Three lectures. *Prerequisites: Math. 71, 77, CSE 65, or CSE 62A-B or consent of the instructor.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (F,W,S)

**177. PASCAL Programming (4)**

Renumbered. See Math. 77.

**178. Elements of Systems Programming (4)**

Aspects of systems programming important to mathematicians/computer scientists: machine architecture and assembly language, introduction to the implementation of languages (data representation, control structures, storage management, recursion, subprograms and parameter transmission, local environments). Three lectures. *Prerequisites: Math. 2C or equivalent and programming experience.* (W)

**179A-B. Introduction to Artificial Intelligence (4-4)**

A general introduction to the basic ideas, techniques, and problems of artificial intelligence including knowledge of representation, search methods, pattern matching, goal reduction, production systems, and control strategies. The logical foundation for automated reasoning and program verification will be provided. The programming languages Lisp and Prolog will also be introduced and used for course work. Three lectures. *Prerequisite: Math. 176A or CSE 161A.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (W,S)

**180A. Introduction to Probability (4)**

Probability spaces, random variables, independence, conditional probability, distribution, expectation, joint distributions, central-limit theorem. Three lectures. *Prerequisites: Math. 2C-D or 3C-D.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (F)

**180B. Introduction to Probability (4)**

Random vectors, multivariate densities, covariance matrix, multivariate normal distribution. Poisson process. Other topics if time permits. Three lectures. *Prerequisites: Math. 180A and Math. 2F.* (W)

**180C. Introduction to Probability (4)**

Markov chains in discrete and continuous time, random walk, recurrent events. If time permits, topics chosen from stationary normal processes, queueing theory. Three lectures. *Prerequisite: Math. 180B.* (S)

**181A. Introduction to Mathematical Statistics (4)**

Random samples, linear regression, least squares, testing hypotheses and estimation. Neyman-Pearson lemma, likelihood ratios. Three lectures, one recitation. *Prerequisites: Math. 180A and 2E or 3E.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (W)

**181B. Introduction to Mathematical Statistics (4)**

Goodness of fit, special small sample distribution and use, nonparametric methods. Komogorov-Smirnov statistics, sequential analysis. Three lectures. *Prerequisite: 181A.* (S)

**182. Introduction to Combinatorics (4)**

Combinatorial methods and their computer implementation. Permutations and combinations; generating functions; partitions, principle of inclusion and exclusion. Polya's theory of counting. Hall's theorem; assignment problem; backtrack technique; error-correcting codes; combinatorial optimization problems. Three lectures, one recitation. *Prerequisites: Math. 2E and programming experience.* (W)

**183. Statistical Methods (4)**

Introduction to probability. Discrete and continuous random variables — binomial, Poisson and Gaussian distributions. Central limit theorem. Data analysis and inferential statistics: graphical techniques, confidence intervals, hypothesis tests, curve fitting. This course is recommended for students in science and engineering. Three lectures, one recitation. This course may not be used to satisfy upper-division course requirement for any mathematics major. (Credit not offered for

both Math. 183 and Economics 120A.) *Prerequisite: Math. 2C or 3C.* (F,S)

**184A-B. Mathematical Foundations of Computer Science (4-4)**

Enumeration of classical combinatorial structures. Binomial coefficients. Stirling numbers. Inclusion-Exclusion. Partitions. Generating functions. Difference Equations. Polynomial Operators. Exponential Structures. Trees with application to computer programs. Backtracking. Tableaux and Schur Functions. Polya Theory. Graph, matching, and network algorithms. Games. (Credit not offered for both Math. 184A-B and CSE 160A-B.) Three lectures, one recitation. *Prerequisite: Math. 2E or equivalent.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (W,S)

**185. Introduction to Computational Statistics (4)**

Statistical analysis of data by means of package programs. Regression, analysis of variance, discriminant analysis, and analysis of categorical data. Emphasis will be on understanding the connections among statistical theory, numerical results, and analysis of real data. Three lectures. *Prerequisite: Math. 181B or equivalent.*

**186A-B. Principles of Algorithm Implementation (4-4)**

Methods and tools that make for effective program design developed through case studies of nonnumerical algorithms from sorting, searching, backtracking, and algorithmic graph theory. Includes top down and structured programming, data structures, run time analysis, program correctness, comparative studies of algorithm design. Three lectures. *Prerequisites: Math. 176A, 103A.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (F,W)

**187. Introduction to Cryptography (4)**

An introduction to the basic concepts and techniques of modern cryptography. Classical cryptanalysis. Probabilistic models of plaintext. Monalphabetic and polyalphabetic substitution. The one-time system. Caesar-Vigenere-Playfair-Hill substitutions. The Enigma. Modern-day developments. The Data Encryption Standard. Public key systems. Security aspects of computer networks. Data protection. Electronic mail. Three lectures, one recitation. *Prerequisite: programming experience.* (S)

**188. Design and Analysis of Algorithms (4)**

Design and analysis of algorithms with emphasis on nonnumerical algorithms. Paradigms and heuristics. Measuring complexity of algorithms, time, and storage. Three lectures. *Prerequisites: Math. 176A, 184A, and 167.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (S)

**189A-B-C. Compilers (4-4-4)**

Compilers for high-level programming languages. Project to develop a working compiler. Part A: regular expressions and finite automata, context free grammars, parsing techniques. Part B: syntax directed translation, semantic actions (for declarations, statement structures, assignments, array references, expression evaluation, procedure and function calls), symbol tables, run-time storage management. Part C: error recovery, optimization, code generation. Three lectures. *Prerequisites: Math. 176A, 186A, and 103A or consent of instructor.* [Warning: There are duplicate credit restrictions on this course. See section on Duplication of Credit.] (F,W,S)

**190. Introduction to Algebraic and Geometric Topology (4)**

Euler characteristic, classification of 2-manifolds. Fundamental group, Van Kampen's theorem, covering spaces. Differential topology. Borsuk-Ulam theory and the Kuroch subgroup theorem. Three lectures. *Prerequisites: Math. 2E or 3E and consent of instructor.* (W)

**191. Topics in Topology (4)**

Topics to be chosen by the instructor from the fields of differential algebraic, geometric, and general topology. Three lectures. *Prerequisite: consent of instructor.* (S)

**195. Introduction to Teaching in Mathematics (4)**

Students will be responsible for and teach a class section of a lower-division mathematics course. They will also attend a weekly meeting on teaching methods. (Does not count towards a minor or major.) Five lectures, one recitation. *Prerequisite: consent of instructor.* (F,W,S)

**198. Directed Group Studies in Mathematics (1 to 4)**

Group study course in some topic not covered in the under-



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graduate curriculum. (P/NP grades only.) *Prerequisite:* consent of instructor. (F,W,S)

**199. Independent Study for Undergraduates (2 or 4)**  
Independent reading in advanced mathematics by individual students. Three periods. (P/NP grades only.) *Prerequisite:* permission of department. (F,W,S)

### Graduate

#### 200A-B-C. Algebra (4-4-4)

Group theory. Jordan-Holder theorem, Sylow theorems. Rings, polynomial rings, principal ideal domains, radicals, Wedderburn theorems, Hilbert Basis theorem. Modules, exact sequences, projective modules, tensor products. Fields, algebraic and transcendental extensions, algebraic closure, finite fields. Galois theory, fundamental theorem, solvability by radicals. *Prerequisites:* Math. 100A-B-C or consent of instructor. (F,W,S)

#### 201A-B-C. Basic Topics in Algebra (4-4-4)

Recommended for all students specializing in algebra. Basic topics include categorical algebra, commutative algebra, group representations, homological algebra, nonassociative algebra, ring theory. *Prerequisites:* Math. 200A-B-C or consent of instructor. (F,W,S)

#### 202A-B-C. Applied Algebra (4-4-4)

Selected topics in applied mathematics that are principally algebraic in nature, Boolean algebras, group codes, polynomial rings and polynomial codes, selected applications of finite fields, recurrent sequences, switching theory, finite state machines. *Prerequisites:* Math. 103A-B or Math. 100A-B. (F,W,S)

#### 203A-B-C. Algebraic Geometry (4-4-4)

Places, Hilbert Nullstellensatz, varieties, product of varieties: correspondences, normal varieties. Divisors and linear systems; Riemann-Roch theorem; resolution of singularities of curves. Grothendieck schemes; cohomology, Hilbert schemes; Picard schemes. *Prerequisites:* Math. 200A-B-C. (W,S)

#### 204A-B-C. Number Theory (4-4-4)

Topics in number theory such as: algebraic number theory, cyclotomic and Kummer extensions, class number, units, splitting of primes in extensions, zeta and L-functions, Tchebotarev density theorem, prime ideal theorem, Brauer-Siegel theorem, class field theory (abelian extensions, reciprocity laws), p-adic numbers, adeles, number theory of simple algebras, diophantine equations and approximation; quadratic forms; Hasse-Minkowski theorem, Siegel theorem; automorphic forms and applications such as Kronecker limit formula, Rademacher's result of the partition function. *Prerequisite:* consent of instructor. (F,W,S)

#### 205A-B-C. Topics in Number Theory (4-4-4)

Various advanced topics in number theory. *Prerequisite:* consent of instructor. (F,W,S)

#### 207A-B-C. Topics in Algebra (4-4-4)

In recent years, topics have included number theory, commutative algebra, noncommutative rings, homological algebra, and Lie groups. May be repeated for credit with consent of adviser. *Prerequisite:* consent of instructor.

#### 208. Seminar in Algebra (1-4)

*Prerequisite:* consent of instructor. (S/U grades permitted.)

#### 209. Seminar in Number Theory (1 to 4)

*Prerequisite:* consent of instructor. (S/U grades permitted.)

#### 210A. Mathematical Methods in Physics and Engineering (4)

Vector spaces and linear transformations, eigenvalue problems, tensor algebra, matrices, norms, completeness, the spaces  $L_p$  and  $C$ , distributions, delta sequences. Properties of Lebesgue, Stieltjes, line integrals. Analytic functions. *Prerequisites:* Math. 2D-E or 3D-E and 140A, or advanced calculus. (F)

#### 210B. Mathematical Methods in Physics and Engineering (4)

Scalar products, orthogonal series in Hilbert space, best approximation. Compact symmetric operators, expansions in eigenvectors. Applications to matrices, quadratic forms, integral equations. Regular and singular Sturm-Liouville problems. Green's functions. *Prerequisite:* Math. 210A or consent of instructor. (W)

#### 210C. Mathematical Methods in Physics and Engineering (4)

Fourier transforms of functions and distributions. Laplace transforms, applications to boundary value problems. Simple second order elliptic, hyperbolic and parabolic partial differential equations. Uniqueness theorems, maximum principles. Spherical harmonics. Wave propagations. *Prerequisite:* Math. 210B or consent of instructor. (S)

#### 210D. Mathematical Methods in Physical and Engineering (4)

Elements of measure and integration theory, convergence theorems,  $L_p$ -spaces, Fubini theorem, Radon-Nikodym theorem. Applications to probability and elements of calculus of variations as time permits. *Prerequisites:* Math. 210A and 210B or consent of instructor. (S)

#### 215A-B-C. Mathematical Theory of Process Optimization (4-4-4)

Optimal control problems for systems described by nonlinear differential equations, necessary conditions, sufficient conditions; existence theorems, applications to classical calculus of variations and to problems in electrical and aerospace engineering. Optimal control problems for systems described by nonlinear difference equations, applications to the theory of optimal economic growth. *Prerequisites:* Math. 241A-B-C or consent of instructor. (F,W,S)

#### 217A-B-C. Topics in Applied Mathematics (4-4-4)

In recent years, topics have included applied complex analysis, special functions, and asymptotic methods. May be repeated for credit with consent of adviser. *Prerequisite:* consent of instructor.

#### 218. Seminar in Applied Mathematics (1 to 4)

*Prerequisite:* consent of instructor. (S/U grades permitted.)

#### 220A-B-C. Complex Analysis (4-4-4)

Complex numbers and functions. Cauchy theorem and its applications, calculus of residues, expansions of analytic functions, analytic continuation, conformal mapping and Riemann mapping theorem, harmonic functions. Dirichlet principle, Riemann surfaces. *Prerequisites:* Math. 140A-B or consent of instructor. (F,W,S)

#### 221A-B-C. Several Complex Variables (4-4-4)

Formal and convergent power series, Weierstrass preparation theorem; Cartan-Ruckert theorem, analytic sets; mapping theorems; domains of holomorphy; proper holomorphic mappings; complex manifolds; modifications. *Prerequisites:* Math. 220A and 220A-B-C, or consent of instructor.

#### 227A-B-C. Topics in Complex Analysis (4-4-4)

In recent years, topics have included conformal mapping, Riemann surfaces, value distribution theory, external length. May be repeated for credit with consent of adviser. *Prerequisite:* consent of instructor.

#### 228. Seminar in Complex Analysis (1 to 4)

*Prerequisite:* consent of instructor. (S/U grades permitted.)

#### 230A-B-C. Ordinary Differential Equations (4-4-4)

Existence and uniqueness theorems. Linear systems with constant and periodic coefficients. Sturm-Liouville theory. Eigenfunction expansions. Stability and asymptotic behavior of nonlinear systems. Poincare-Bendixon theorem. Perturbation theory. Linear systems in the complex domain and their singularities. Control theory. Equations in Banach space. *Prerequisites:* Math. 130A-B and 220A-B or consent of instructor.

#### 231A-B-C. Partial Differential Equations (4-4-4)

Existence and uniqueness theorems. Cauchy-Kowalewski theorem, first order systems. Hamilton-Jacobi theory, initial value problems for hyperbolic and parabolic systems, boundary value problems for elliptic systems. Green's function, eigenvalue problems, perturbation theory. *Prerequisites:* Math. 210A-B or 240A-B-C or consent of instructor.

#### 232A-B-C. Calculus of Variations (4-4-4)

Euler-Lagrange equation theory of fields, Hamilton-Jacobi theory, sufficient conditions, Weierstrass E test. Mayer, Lagrange and Boza problems. Optimal control, Pontryagin's maximum principle, existence theorems, sufficient conditions. Caratheodory's approach to calculus of variations. *Prerequisites:* Math. 240A-B-C or Math. 210A-B-C. (W,S)

#### 233. Singular Perturbation Theory for Differential Equations (4)

Multivariable techniques, matching techniques and averag-

ing techniques, including various approaches to proofs of asymptotic correctness, for singular perturbation problems including initial value problems with nonuniformities at infinity, initial value problems with initial nonuniformities, two point boundary value problems, and problems for partial differential equations. Applications taken from celestial mechanics, oscillation problems, fluid dynamics, elasticity, and applied mechanics. *Prerequisites:* Math. 130A-B or 132A-B or consent of instructor. (S/U grades permitted.) (S)

#### 237A-B-C. Topics in Differential Equations (4-4-4)

May be repeated for credit with consent of adviser. *Prerequisite:* consent of instructor.

#### 238. Seminar in Differential Equations (1 to 4)

*Prerequisite:* consent of instructor. (S/U grades permitted.)

#### 240A-B-C. Real Analysis (4-4-4)

Lebesgue integral and Lebesgue measure; Fubini theorems; functions of bounded variations; Stieltjes integral, derivatives and indefinite integrals; the spaces  $L$  and  $C$ ; equi-continuous families; continuous linear functionals general measures and integrations. *Prerequisites:* Math. 140A-B-C. (F,W,S)

#### 241A-B-C. Functional Analysis (4-4-4)

Metric spaces and contraction mapping theorem; closed graph theorem; uniform boundedness principle; Hahn-Banach theorem; representation of continuous linear functionals; conjugate space, weak topologies; extreme points; Krein-Milman theorem; fixed-point theorems; Riesz convexity theorem; Banach algebras. *Prerequisites:* Math. 240A-B-C or consent of instructor.

#### 242. Topics in Fourier Analysis (4)

A course on Fourier analysis in Euclidean spaces, groups, symmetric spaces. *Prerequisites:* Math. 240A-B-C or consent of instructor. (F,W,S)

#### 247A-B-C. Topics in Real Analysis (4-4-4)

In recent years, topics have included Fourier analysis, distribution theory, martingale theory, operator theory. May be repeated for credit with consent of adviser. *Prerequisite:* consent of instructor.

#### 248. Seminar in Real Analysis (1 to 4)

*Prerequisite:* consent of instructor. (S/U grades permitted.)

#### 250A-B-C. Differential Geometry (4-4-4)

Differential manifolds, Sard theorem, tensor bundles, Lie derivatives, DeRham theorem, connections, geodesics, Riemannian metrics, curvature tensor and sectional curvature, completeness characteristic classes. Differential manifolds immersed in Euclidean space. *Prerequisite:* consent of instructor. (F,W,S)

#### 251A-B-C. Lie Groups (4-4-4)

Lie groups, Lie algebras, exponential map, subgroup subalgebra correspondence, adjoint group, universal enveloping algebra. Structure theory of semi-simple Lie groups, global decompositions, Weyl group. Geometry and analysis on symmetric spaces. *Prerequisites:* Math. 200 and 250, or consent of instructor. (F,W,S)

#### 256. Seminar in Lie Groups and Lie Algebras (2 to 4)

Various topics in Lie groups and Lie algebras including structure theory, representation theory, and applications. *Prerequisite:* consent of instructor. (F,W,S)

#### 257A-B-C. Topics in Differential Geometry (4-4-4)

In recent years, topics have included Morse theory and general relativity. May be repeated for credit with consent of adviser. *Prerequisite:* consent of instructor.

#### 258. Seminar in Differential Geometry (1 to 4)

*Prerequisite:* consent of instructor. (S/U grades permitted.)

#### 259A-B-C. Geometrical Physics (4-4-4)

Manifolds, differential forms, homology, deRham's theorem. Riemannian geometry, harmonic forms. Lie groups and algebras, connections in bundles, homotopy sequence of a bundle, chern classes. Applications selected from Hamiltonian and continuum mechanics, electromagnetism, thermodynamics, special and general relativity, Yang-Mills fields. *Prerequisite:* graduate standing in mathematics, physics or engineering.

#### 260A-B-C. Mathematical Logic (4-4-4)

Propositional calculus and quantification theory. Completeness theorem, theory of equality, compactness theorem, Skolem-Lowenheim theorems. Vaught's test: Craig's lemma.



Elementary number theory and recursive function theory. Undecidability of true arithmetic and of Peano's axioms. Church's thesis; set theory; Zermelo-Frankel axiomatic formulation. Cardinal and ordinal numbers. The axiom of choice and the generalized continuum hypothesis. Incompleteness and undecidability of set theory. Relative consistency proofs. *Prerequisites: Math. 100A-B-C or consent of instructor.*

#### 261A-B-C. Combinatorial Algorithms (4-4-4)

Lexicographic order, backtracking, ranking algorithms, isomorph rejection, sorting, orderly algorithms, network flows and related topics, constructive Polya theory, inclusion-exclusion and sieving methods, Mobius inversion, generating functions, algorithmic graph theory, trees, recursion, depth first search and applications, matroids. *Prerequisites: CSE 160A-B or Math. 184A-B or consent of instructor. (F,W,S)*

#### 262A-B-C. Topics in Combinatorial Mathematics (4-4-4)

Development of a topic in combinatorial mathematics starting from basic principles. Problems of enumeration, existence, construction, and optimization with regard to finite sets. Some familiarity with computer programming desirable but not required. *Prerequisites: Math. 100A-B-C.*

#### 263. History of Mathematics (4-4-4)

Mathematics in the nineteenth century from the original sources. Foundations of analysis and commutative algebra. For algebra the authors studied will be Lagrange, Ruffini, Gauss, Abel, Galois, Dirichlet, Kummer, Kronecker, Dedekind, Weber, M. Noether, Hilbert, Steinitz, Artin, E. Noether. For analysis they will be Cauchy, Fourier, Bolzano, Dirichlet, Riemann, Weierstrass, Heine, Cantor, Peano, Hilbert. *Prerequisites: Math. 100A-B, Math. 140A-B. (S)*

#### 264A-B-C. Combinatorics (4-4-4)

Topics from: Partially ordered sets, Mobius functions, simplicial complexes and shellability. Enumeration, formal power series and formal languages, generating functions, partitions. Lagrange inversion, exponential structures, combinatorial species. Finite operator methods, Q-analogues, Polya theory, Ramsey theory. Representation theory of the symmetric group, symmetric functions and operations with Schur functions. (F,W,S)

#### 265A-B-C. Topics in Algorithmic Combinatorics (4-4-4)

Advanced topics in combinatorial algorithms and the application of combinatorial methods to computer science. Topics chosen from algorithmic methods in enumerative combinatorics, graph theory, group theory, matroid theory, coding theory, cryptography and subjects in computer science that involve applications of these areas. May be repeated for credit with consent of adviser. Three lectures. *Prerequisites: Math. 261A-B or consent of instructor. (F,W,S)*

#### 267A-B-C. Topics in Mathematical Logic (4-4-4)

Topics chosen from recursion theory, model theory, and set theory. May be repeated with consent of adviser. *Prerequisite: consent of instructor. (S/U grades permitted.)*

#### 268. Seminar in Logic (1 to 4)

*Prerequisite: consent of instructor. (S/U grades permitted.)*

#### 269. Seminar in Combinatorics (1 to 4)

*Prerequisite: consent of instructor. (S/U grades permitted.)*

#### 270A-B-C. Numerical Mathematics (4-4-4)

Numerical solution of linear equations, least squares, and eigenvalue problems. Iterative methods for linear equations; solution of nonlinear equations; optimization. Numerical approximation, integration and ordinary differential equations. *Prerequisites: Math. 2E or 3E, and knowledge of Fortran.*

#### 271A-B-C. Complexity of Computational Algorithms (4-4-4)

Recent research on the analysis of the complexity of computational algorithms will be explored: high-precision multiplication, manipulation of graphs, matrix multiplication, inversion, linear equations, sparse matrices, polynomial evaluation, discrete Fourier transforms, algebraic manipulation, lower bounds of computations, polynomial complete problems. *Prerequisite: Math. 102 or Math. 100. Some familiarity with computer science or numerical analysis desirable but not required. (F,W,S)*

#### 272A-B-C. Numerical Partial Differential Equations (4-4-4)

The numerical solution of elliptic, parabolic, and hyperbolic partial differential equations by finite difference and finite el-

ement methods. *Prerequisites: Math. 170A, 172, or consent of instructor. (F,W,S)*

#### 277A-B-C. Topics in Numerical Mathematics (4-4-4)

In recent years, topics have included numerical aspects of complex analysis and ordinary and partial differential equations. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

#### 278. Seminar in Numerical Mathematics (1 to 4)

*Prerequisite: consent of instructor. (S/U grades permitted.)*

#### 280A-B-C. Probability Theory (4-4-4)

Probability measures; Borel fields; conditional probabilities, sums of independent random variables; limit theorems; zero-one laws; stochastic processes. *Prerequisites: advanced calculus and consent of instructor. (F,W,S)*

#### 281A-B-C. Mathematical Statistics (4-4-4)

Testing and estimation, sufficiency; regression analysis; sequential analysis; statistical decision theory; nonparametric inference. *Prerequisites: advanced calculus and consent of instructor.*

#### 282A-B. Applied Statistics (4-4)

Sequence in applied statistics. First quarter; general theory of linear models with applications to regression analysis. Second quarter; analysis of variance and covariance and experimental design. Third quarter: further topics to be selected by instructor. Emphasis throughout is on the analysis of actual data. *Prerequisite: Math. 181B or equivalent or consent of instructor. (S/U grades permitted.)*

#### 285. Statistical Inference in the Medical and Biological Sciences (4)

A first course in statistical procedures for the medical and biological sciences. Topics will be chosen from among experimental design, counts, regression and correlation, analysis of variance, survivorship, classification. Some emphasis will be given to computational techniques. *Prerequisite: consent of instructor. (This course offered only to graduate students in the medical or biological sciences and to medical students.) (W)*

#### 287A. Time Series Analysis (4)

Discussion of finite parameter schemes in the Gaussian and non-Gaussian context. Estimation for finite parameter schemes. Stationary processes and their spectral representation. Spectral estimation. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

#### 287B. Multivariate Analysis (4)

Bivariate and more general multivariate normal distribution. Study of tests based on Hotelling's  $T^2$ . Principal components, canonical correlations, and factor analysis will be discussed as well as some competing nonparametric methods, such as cluster analysis. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

#### 287C. Nonparametric Analysis (4)

Topics covered will include the Mann-Whitney and Wilcoxon, sign, median, and Kruskal-Wallis tests; permutation methods in general; tests for goodness of fit; especially those based on chi-square and Kolmogorov-Smirnov statistics. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

#### 287D. Sequential Analysis (4)

This course will include the Wald sequential probability ratio test, operating characteristics of various sequential tests beyond the SPRT. The sequential estimation of parameters and confidence intervals and empirical Bayes methods will be discussed. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

#### 288. Seminar in Probability and Statistics (1 to 4)

*Prerequisite: consent of instructor. (S/U grades permitted.)*

#### 289A-B-C. Topics in Probability and Statistics (4-4-4)

In recent years, topics have included Markov processes, martingale theory, stochastic processes, stationary and Gaussian processes, ergodic theory. May be repeated for credit with consent of adviser.

#### 290A-B-C. Topology (4-4-4)

Point set topology, including separation axioms, compactness, connectedness. Algebraic topology including the fundamental group, covering spaces, homology and cohomology. Homotopy or applications to manifolds as time permits. *Prerequisites: Math. 100A-B-C and Math. 140A-B-C. (F,W,S)*

#### 295. Special Topics in Mathematics (1 to 4)

A variety of topics and current research results in mathematics will be presented by staff members and students under faculty direction.

#### 297A-B-C. Topics in Topology (4-4-4)

In recent years, topics have included generalized cohomology theory, spectral sequences, K-theory, homotopy theory. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor. (F,W,S)*

#### 298. Seminar in Topology (1 to 4)

*Prerequisite: consent of instructor. (S/U grades permitted.)*

#### 299. Reading and Research (1 to 12)

Independent study and research for the doctoral dissertation. One to three credits will be given for independent study (reading) and one to nine for research. *Prerequisite: consent of instructor. (S/U grades permitted.)*

## Teaching of Mathematics

#### 500. Apprentice Teaching (1 to 4)

Supervised teaching as part of the mathematics instructional program on campus (or, in special cases such as the CTF program, off campus). *Prerequisite: consent of adviser. (S/U grades only.)*

#### 501. Computer Assistance in Mathematics Teaching (4)

Instruction in the use of scientific programming languages and UCSD computing facilities as an aid in the teaching of mathematics. One lecture. *Prerequisite: graduate-student status in mathematics. (S)*

## MUIR COLLEGE

OFFICE: Provost, Muir College  
2126 Humanities and Social  
Sciences Building

## Courses

#### 199. Muir Special Project (4-16)

A course of independent work on a research or creative project to satisfy a Muir graduation requirement. (Only Muir students who have had Muir Special Project proposals approved may enroll in this course.) Students wishing to enroll must submit a written request with a description of the project. (Muir students must submit the Muir Special Project 199 form to the major adviser and to the Office of the Provost by the seventh week of the quarter prior to the quarter in which the 199 is to be undertaken. For information on other requirements, consult the provost's office.) *Prerequisites: upper-division status, approval by project adviser and by provost. (Letter grades only.)*

## The Writing Program

The Muir College Writing Program is a sequence of courses in critical thinking and the writing of expository prose. During these courses, students must advance beyond the basic competency expected at entrance to understand and write discourse acceptable at the university level. Even when faced with challenging topics, students must demonstrate the ability to comprehend texts at more than a superficial level; their writing must exhibit focussed theses, systematic methods of analysis and argumentation, awareness of the needs of their audience, strong organization and development, clear presentation of ideas, appropriate syntax and dic-

## MUSIC

tion, and — needless to say — correct grammar and usage.

To achieve these ends, the courses focus on principles of analysis and reasoned argumentation. Through close reading of texts, students learn both to identify underlying issues, assumptions, and values, and to identify rhetorical strategies by which these are conveyed or revealed. Students also learn to monitor and adapt their own writing processes. Since the ability to evaluate one's own writing and carry out appropriate revision strategies is particularly crucial to effective writing, all students are required to revise their papers several times. Attention is devoted to developing skill in evaluation and revision in discussion sections and in individual conferences with instructors. Sections of Muir 50 vary in theme and content, giving students the opportunity to write in areas that interest them or that may be relevant to their major fields. (Descriptions of the Muir 50 sections are available each quarter in the Muir Writing Program office during preregistration.)

Students entering fall quarter 1984 and after will be required to take both Muir 40 and Muir 50 for a letter grade in their first year of residence at the college. Beginning fall quarter 1987 all transfer students, upon satisfaction of Subject A, must take Muir 40 and Muir 50 in their first year of residence. In cases where more than one quarter of practice is needed to prepare a student for Muir 50, an IP grade is given in Muir 40, and the student takes Muir 41. Completion of the sequence allows students to meet the Muir College writing requirement.

Certain exceptionally well-prepared students, particularly transfer students, may satisfy Muir 50 by examination. The Advanced Writing Examination is given in the second week of each quarter.

### 40-50. Critical Writing (4-4)

A sequence in university reading and writing required of all Muir College freshmen and of transfer students who have not completed comparable courses elsewhere. Satisfies the Muir College graduation requirement in writing. Muir 40 introduces students to the basic elements of argument and analysis. Muir 50 focuses on advanced skills of argument and analysis. In both courses, students will engage in close reading of texts, weekly writing and revision, and individual conferences. Both courses must be taken for a letter grade. Those who need additional work to prepare for Muir 50 will be given a grade of IP and will be required to take Muir 41. *Prerequisite: satisfaction of Subject A requirement.*

### 41. Special Study in Writing (4)

An individualized writing class including both class discussion and tutorials. Students confer individually with instructors on a regular weekly basis to talk about writing problems. The course is designed for students who have taken Muir 40 or its equivalent but need additional writing practice to prepare for Muir 50. Muir 41 does not satisfy the first part of the Muir Writing requirement. Muir 41 must be taken for a letter grade and must be taken within two quarters of Muir 40. *Prerequisite: Muir 40 or its equivalent.*

## MUSIC

OFFICE: 110 Mandeville Center for the Arts

### Professors:

Robert Erickson, M.A.  
(*Professor Emeritus*)  
Peter Farrell, M.M. (*Vice Chairman*)  
Jean Charles Francois, 1<sup>er</sup> Prix  
Edwin Harkins, Ph.D.  
Cecil Lytle, B.A. (*Chairman*)  
F. Richard Moore, Ph.D.  
Thomas Nee, M.A.  
János Négyesy, Dip. Mus.  
Wilbur Ogdon, Ph.D.  
Carol Plantamura, M.F.A.  
Roger Reynolds, M.M.  
John Silber, Ph.D.  
Bertram Turetzky, M.A.  
Joji Yuasa

### Associate Professor:

Gerald Balzano, Ph.D.

### Assistant Professors:

John Fonville, D.M.A.  
Jann Pasler, Ph.D.

### Lecturer:

James Cheatham, Dip. Mus.

### Artists in Residence:

Celin Romero, Dip. Mus., B.A.  
Pepe Romero, B.A.

### Affiliated Faculty:

Garrett Bowles, Ph.D.  
David Chase, D.M.A.  
Mark Dolson, Ph.D.  
Rev. Glenn Jones  
Philip Larson, M.M.

The Department of Music is dedicated to the development of musical intelligence. The goal of its graduate program is to educate researchers who will extend the musical intelligence of the entire music community; its undergraduate program aims to enhance the musical intelligence of students in their appreciation of the music-making process.

In addition to our regular faculty, the Department of Music regularly invites outstanding composers and performers as visitors. Previous visitors have been John Cage, Toru Takemitsu, Henry Brandt, Morton Feldman, Joan Tower, Charles Wuorinen, Iannis Xenakis, and Anthony Braxton.

## The Undergraduate Program

The special characteristic of the undergraduate program in music at UCSD has been its attempt to coordinate graduate activity with undergraduate studies. By involving undergraduate students whenever possible with faculty and graduate

students, undergraduates are offered special opportunities for enlarging their musical abilities and understanding. In particular, the department affords its undergraduates a unique opportunity to gain advanced familiarity with contemporary thinking about and practice of music.

Undergraduate courses offered in the Department of Music satisfy a wide range of student interests. For students with little background in the study of music, there are three sets of introductory courses; those that lead the student to a personal understanding of the nature of music through various projects in which music is made and performed by the students themselves (Music 5); those that develop basic skills musicians use in the analysis and performance of music (Music 1A-B-C); and those that introduce students to the music heritage of traditional and contemporary cultures (Music 4-14). For students who have more background and who intend to continue in upper-division music theory and practice courses, Music 2A-B-C (instead of 1A-B-C) and Music 22A-B-C are essential.

Due to the need to form musical groups of the size and type appropriate to the education of music majors, the department will occasionally approve the taking of individual instruction (Music 32) by non-majors. Students enjoying this privilege must concurrently enroll in other music courses such as Music 2 or 3, or a music ensemble (95's) each quarter.

Particular major or minor requirements and course prerequisites may be waived by examination for students with sufficient background in music.

Although careers in music have generally been associated with performance in large ensembles or with teaching in music education programs, there is a growing number of opportunities which relate to more individualized combinations of practical and technical skills. These might include, for example, arts management, recording and computer-related business, and music publishing. One cannot prepare adequately for most professional roles in music with a bachelor's degree, but a strongly practical, flexible, and broadly conceived training at the undergraduate level is, we believe, the ideal route to the widest range of future possibilities.

The Central University Library houses an extensive collection of holdings in contemporary music, including an archive of recordings of most Department of Music performances.

## Major Programs

The Department of Music is committed to active, inventive music making; thus all music majors are encouraged and normally expected to participate in an ensemble performance group each quarter. As a minimum, every major is required to enroll in Music 95, Music 130, or Music 131 ensemble performance for at least six quarters with three quarters of participation specifically in a reading chorus (Music 95C, 95D, 95 F vocal, or 95K). (Transfer students will be credited for corresponding activities at other institutions.)

Two undergraduate major programs in music leading to the B.A. degree are offered at UCSD. The **music major program** is intended for students interested in music as one of the fine arts, who may wish later to engage in music as a profession; most of the courses in this major involve the student in the performance as well as the analysis of music. This major thus requires extensive development of technical musical skills. A student without the appropriate level of those skills upon entrance to UCSD must devote considerable time to attaining them, either in lower-division courses or independent study. For that reason, this program is suited for students in Muir, Third, and Warren College whose college requirements permit considerable specialization in the lower division; however, Revelle College students with training in music prior to entrance at UCSD may also pursue this program.

The **music/humanities program** is intended for students interested in music as one of the liberal arts, who wish to gain extensive knowledge and appreciation of music that will enable them to form part of an understanding, sophisticated musical public. Because it does not require training in music prior to entrance into UCSD nor extensive, time-consuming training in musicianship skills, it fits the special need of students in Revelle College, although it is open also to students in Muir College, Third College, and Warren College who do not plan to pursue a career in music or to undertake graduate studies.

All courses to be counted toward satisfying major requirements in music must be passed with a grade of C (P) or better.

While special studies courses (Music 194, 199) are made available to music students, they are generally not allowed as substitutes for required courses.

A minimum residency of one year is required of all music majors; however, most

students take at least two years to complete requirements.

### The Music Major Program

The lower-division requirements for this major are Music 5, Music 2A-B-C, Music 20A-B-C, and Music 22A-B-C. For students in this program Music 5 and 2A, B, or C may be taken concurrently. To complete the major requirements the following courses are required:

1. Music 101A-B-C.
2. Music 102A-B-C (normally taken in the senior year).
3. Two quarters of Music 133 (normally taken in the winter quarters of the junior and senior years).
4. Music 111 or Music 114.
5. One of the following sequences: Music 103A-B-C (*composition*), Music 104, 105, 106 (*music science and technology*), three quarters of Music 132 (*performance*), or three additional courses from the series Music 111-127 (*literature*).
6. Six quarters of Music 95, 130, or 131 (three from 95C, 95D, or 95K).
7. Music 143 every quarter.

### Honors

The requirements for a B.A. degree with honors in music are the same as the music major program, but with specification that twelve additional unit-credits be taken in courses in the area of emphasis: advanced performance (specifically in Music 132R), advanced composition (specifically in Music 103D-E-F), advanced music science and technology (Music 107 and/or 199), or advanced music literature (Music 111-127 and/or 199). To be admitted to the honors program, a student must pass an audition before a jury of faculty members from the department; to graduate with honors the student must give a public presentation of the results of the honors study. In accordance with university regulations, however, only 20 percent of students graduating in any academic year, who fulfill departmental requirements will be granted departmental honors. Faculty will review honors candidates in the spring quarter only.

### The Music/Humanities Major Program

The lower-division requirements for this major are a total of five courses: Music 3A, 5, and 22A-B-C. In addition, twelve upper-division courses are required to

satisfy the major requirements, of which six must be music literature courses (Music 111-127); the other six must form a coherent set of humanities or fine arts upper-division courses relevant to a music major. For example, the six related courses might all be in art history, or they might be courses distributed over several departments (e.g., history, literature, and visual arts), all dealing with the baroque period in the arts. Advance approval of these six related courses must be secured in writing from the departmental music-humanities major adviser. To complete this major, six quarters of participation in ensemble performance — through enrollment in Music 95, 130, or 131 — is required. Continuous enrollment in Music 143 (department seminar) is also required. All music/humanities majors must submit, in writing, a course proposal to their music faculty adviser at the beginning of their junior year.

### Transfer Students

Students who plan to transfer into the Department of Music should have strong skills in basic musicianship. For those planning to emphasize performance, solid proficiency on the instrument is required. A general course in the history of music is recommended.

To verify the acceptability of transfer courses, students should make an appointment with the Department of Music adviser. A degree check will be done and results placed in the student's file. Students are asked to take a placement exam in musicianship/theory. They should also plan to provide transcripts and syllabi for any music history, literature, performance, composition, or technology courses taken elsewhere that they wish to have counted.

### Minor Programs

To satisfy the noncontiguous minor requirements for Revelle College or the optional minor requirements for Muir or Third College, a student may take twenty-four quarter-units in music courses with a grade of C or better, of which twelve quarter-units must be in upper-division courses. To satisfy one of the two required Warren College programs of concentration for the B.A. degree, a student may take twenty-four quarter-units in music courses with a grade of C (or P) or better; of these a sufficient number must be earned in upper-division courses to bring the total number of upper-division quarter-units in the two programs of concentration to twenty-four. In lieu of pro-

## MUSIC

grams of concentration, Warren College B.S. in engineering majors may select one of two required three-course area studies from a special list of options in humanities and fine arts. (One of the three courses must be upper-division.) The Department of Music offers many of its courses as elements which are possible to combine for a minor program. All combinations meeting the above conditions will be considered. However, students should seek advice and obtain approval from their departmental adviser prior to embarking upon a minor program.

### Advising Offices

|         |  |
|---------|--|
| Muir    | Professor Francois, 119<br>Mandeville Center, 534-6754   |
| Revelle | Professor Fonville, B-130<br>Mandeville Center, 534-4712 |
| Third   | Professor Cheatham, B-140<br>Mandeville Center, 534-2182 |
| Warren  | Professor Pasler, 118<br>Mandeville Center, 534-6722     |
| M.A.    | Professor Nee, B126<br>Mandeville Center, 534-2679       |
| Ph.D.   | Professor Silber, B122<br>Mandeville Center, 534-4781    |

### Staff Contact:

Undergraduate and Graduate:  
Eleanor Little, 109 Mandeville Center,  
534-3279

## The Graduate Program

The department offers programs leading to the degree of master of arts in music and the degree of doctor of philosophy in music.

Normally, students will be admitted to begin graduate studies in the fall quarter only; applications should be submitted by January 15 of the admission year; failure to meet that deadline will jeopardize the applicant's opportunity for admission and financial support. Applicants to graduate studies in music must submit, as part of the application, the following:

- Tapes demonstrating their level of vocal and/or instrumental performance. It is expected that applicants will be acceptably proficient in one area of performance skills.
- A repertory list of works performed during the past year and a sample of printed concert programs in which they have participated.
- A minimum of two papers illustrating ability in any one of the following: analysis, criticism, aesthetics, or music technology.
- Where applicable, a minimum of two

scores of instrumental works with tapes of these (and also of electronic compositions, if desired).

- Scores attained on the Graduate Record Examination — including the Aptitude Test and the Advanced Test in Music — given by the Educational Testing Service of Princeton, New Jersey. (Foreign students must submit TOEFL scores.)
- Official transcripts.

After an **advisory examination** administered during the week prior to the start of classes in the fall quarter, each new student will meet with the departmental master's or Ph.D. adviser. Students found to be deficient in any areas covered on the advisory examination (dictation and error recognition, style recognition, guided composition, analysis, sight reading, keyboard proficiency, technology) will be expected to remedy deficiencies during their first year and will be retested at the end of that first year. **Students will not be advanced to candidacy nor will second-year financial support be awarded until all deficiencies are remedied.** The appropriate departmental adviser or the student's individual adviser must approve student course programs each quarter prior to registration for classes, as well as any significant change in those programs.

## MASTER'S DEGREE PROGRAM

The department offers work leading to a master of arts in music with emphasis on *composition, performance, computer music, or theoretical studies*. The degree requires completion of at least thirty-six quarter-units of graduate courses (courses numbered 201-299), including six units of Music 299 bearing directly on completion of the master's thesis. Master's students are expected to complete all requirements for the degree in six quarters of residence.

### Course Requirements

Since the department at all levels encourages the actual making of new music, all master's candidates are required to share in this activity by enrolling in **Music 201A-B-C**, Projects in New Music Performance, for both years of their residence at UCSD. (Performers must take 201A-B-C laboratory 2, Twentieth-Century Ensemble, every quarter; non-performers must take 201B, winter quarter, twice, as well as Music 228, Conducting.) In addition, all graduate students are expected to attend regularly the departmental collo-

quia and concerts aimed at extending and sharing their musical experience, and are encouraged to use these as opportunities to present their own work, their research, and creative interests.

Because of the importance of technology in present-day music, all graduate students must become familiar with and capable of handling the appropriate technological facilities of the department; to that end graduate students wishing to use electronic studios or take Music 205 are required to pass an examination in the modern technology of music by the end of their first quarter at UCSD or to enroll in Music 104. In addition, all M.A. students are required to take Music 210, Musical Analysis, and Music 291, Problems and Methods of Music Research and Performance. To complete their emphasis requirements, students concentrating on *composition* in their M.A. programs must take the composition seminar sequence Music 203A-B-C and two courses in theoretical or experimental studies. At the end of the fall and spring quarters, juries are held at which the student's current compositions are heard. If the level of work is deemed unacceptable by the assembled composition faculty, the student may not continue with individual study under 203D or pursue a thesis with compositional emphasis. Such students will pursue their degree work in another emphasis. Students emphasizing *performance* must take the performance sequence 232 (a minimum of four quarters) and two courses in music literature or performance practices.

Students who wish to emphasize *theoretical studies* or *computer music* in their M.A. programs must demonstrate proficiency in either composition or performance by satisfactorily (grade of B or better) completing, in their first year, either the composition seminar sequence Music 203A-B-C or the performance sequence 232A-B-C. In the second year, students emphasizing *theoretical studies* must take two courses in theoretical studies (207's), and one course in experimental studies (206's); students emphasizing *computer music* must take one quarter of Music 205D (supervised individual computer music project), one quarter of theoretical or experimental studies (206 or 207), and Music 256 (Advanced Computer Music Seminar, four to six units total).

To supplement their course programs (*a full-time graduate student is required to carry a minimum of twelve units per quarter*), the student may choose among a variety of graduate or upper-division courses in music or related courses in



other departments, as approved by the student's adviser. If the student's research area calls for reading proficiency in one or more foreign languages, the student's master's thesis committee will require that the student present evidence of proficiency. In order to be able to certify that its graduates are competent teachers of music, the department requires that a master's candidate serve as an apprentice teacher under the supervision of a member of the faculty; this requirement is satisfied by earning a total of six units of credit in Music 500. If a funded TA appointment is not available, it is the student's responsibility to find and propose an appropriate way of fulfilling this requirement. All graduate students must enroll in the department seminar, Music 143, every quarter.

A folio of three research papers (normally to be written in connection with the courses the student will be taking) must be accepted by the student's committee prior to approval of the thesis.

### The M.A. Program

| Fall   | Winter     | Spring     |
|--|------------|------------|
| <b>Composition Emphasis</b>                                      |            |            |
| <i>First Year</i>  |            |            |
| 203A   | 203B       | 203C       |
| 210  | 201B       | 291        |
| *Other   | 228        | *Other     |
| <i>Second Year</i>   |            |            |
| 203D   | 299        | 299        |
| 206/207  | 207/205    |            |
| *Other   | 201B       | *Other     |
| <b>Performance Emphasis</b>                                      |            |            |
| <i>First Year</i>  |            |            |
| 232  | 232        | 232        |
| 201A   | 201B       | 291        |
| 210  |            | 201C       |
| *Other   | *Other     | *Other     |
| <i>Second Year</i>   |            |            |
| 232D   | 299        | 299        |
| Lit /Perf  | Lit /Perf. |            |
| 201A   | 201B       | 201C       |
| *Other   | *Other     | *Other     |
| <b>Theoretical Studies Emphasis</b>                              |            |            |
| <i>First Year</i>  |            |            |
| Same as for Composition, or Performance Emphasis, plus Music 228 |            |            |
| <i>Second Year</i>   |            |            |
| 206  | 299        | 299        |
| 207  | 207        |            |
| *Other   | 201B       | *Other     |
| <b>Computer Music Emphasis</b>                                   |            |            |
| <i>First Year</i>  |            |            |
| 205A   | 205B       | 205C       |
| 210  | 201B       | 291        |
| 203A/232A†   | 203B/232B† | 203C/232C† |
| *Other   | 228        | *Other     |
| <i>Second Year</i>   |            |            |
| 205D   | 299        | 299        |
|  | 256        | 256        |
| 206  | 201B       |            |
| *Other   | 207        | *Other     |
|  | *Other     |            |

†Students emphasizing computer music must take either the 203 composition seminars or the 232 performance sequence in their first year, and either 206 (Experimental Studies) or 207 (Theoretical Studies) during the second year.

\*Other courses and activities will include electives, Music 500, Music 143, departmental colloquia, and concerts.

### Master's Thesis

M.A. candidates will present a thesis consisting of the following under the supervision of the student's graduate adviser in Music 299:

- a. Candidates emphasizing *composition* will prepare a folio of three chamber compositions together with tape recordings of at least two of them.
- b. Candidates emphasizing *performance* will present a lecture-recital lasting an hour — the program to be approved by the departmental master's degree adviser.
- c. Candidates emphasizing *theoretical studies* will write an extended research paper on a topic chosen with their adviser.
- d. Candidates emphasizing *computer music* will write a research paper and present a lecture-performance in which the scientific, technological, and musical aspects of an original computer music composition are documented, played, and discussed.

The specific nature of the thesis to be undertaken — including the types of compositions in the folio for composition emphasis, the program of the lecture-recital for performance emphasis, the topic of the extended research paper for theoretical studies emphasis, and the nature of the computer music project — must be approved in advance by the student's master's thesis committee, typically in the student's fourth quarter in residence. The entire thesis must be approved by that committee upon completion.

### DOCTORAL DEGREE PROGRAM

Students of superior musical competence may pursue a program with emphasis in *composition* or in *theoretical studies* leading to the Ph.D. in music, under the general requirements for the doctor of philosophy degree as described in the section "Graduate Studies" of this catalog. Emphasis in *composition* or in *theoretical studies* is not necessarily incompatible with significant stress on performance or computers. The specific departmental requirements for the degree are:

1. Successful completion of an M.A. degree including requirements equivalent to those described above for the M.A. in music. (Students with graduate degrees or courses from other institu-

tions will be appropriately credited. Music 104 and Music 210 must be taken in the first quarter of the Ph.D. program and Music 291 in the third quarter if proficiency cannot be demonstrated. Music 201A-B-C and 228 must also be taken as described in the typical Ph.D. program which follows, if the student has not participated in UCSD's master's degree program.)

2. A minimum of eight doctoral-level seminars beyond the M.A. which are approved in consultation with the student's committee. Ph.D. students are expected to take two or three 209-level seminars during each of their first two years, and these four courses, in addition to four chosen from the 206/207 offerings, will be counted towards the required eight. (Please see following "Typical Programs for the Ph.D." for additional basic required course work.)
3. a. One research paper judged to be of publishable quality, to be completed prior to qualifying examinations.

N.B. The subject of the "publishable paper" will be developed during the student's first two years and must be approved by the student's Ph.D. committee chairperson. The student and his or her committee chairperson should discuss the paper topic and a date for presentation of the first draft to be due some time during spring (sixth) quarter of the student's second year. At that point the paper will be reviewed by the student's entire committee. A final version of the paper will be presented to the committee chairperson before the last day of fall quarter (seventh quarter) of the student's third year.

If the paper is acceptable, a date for the qualifying exam will be set for the following spring quarter; if not, the student has one and one-half quarters to make the necessary improvements.

- b. For students taking a *composition* emphasis, an additional folio of not fewer than three compositions (not previously accepted for an M.A. degree) to be completed prior to qualifying examinations.

N.B. Composition students must take the 203A-B-C seminar series as well as 203D, individual study, with a member of the composition faculty.



## MUSIC

4. Demonstration through written and oral examinations of a comprehensive understanding of literature and theory of the field.

N.B. All required course work as well as the publishable paper must be completed previous to qualifying (written and oral examination) for the Ph.D. degree.

5. An acceptable dissertation (*theoretical studies*) or a major composition project (*composition*).
6. A final public defense of the dissertation/composition.
7. Six units of credit in Music 500 (unless the student has completed this requirement in UCSD's master's degree program).
8. Music 143 every quarter until qualifying exams are passed.

Materials previously submitted for other degrees are not acceptable for submission for the Ph.D. degree.

The required courses beyond the requirements for the M.A. are assigned by the student's doctoral adviser after review of the student's academic background and abilities, as confirmed by appropriate departmental testing. However, the student should not expect these courses alone to prepare him or her for doctoral examinations. The student is expected to choose other electives in music and electives in other disciplines such as history, literature, art history, philosophy, and physics when useful. The student will also undertake independent studies, supervised by an appropriate member of the faculty, and prepare himself or herself in the library and laboratory for qualifying examinations.

In addition, the doctoral student is expected to continue participation in departmental colloquia and music-making activities.

The normative time for the Ph.D. in music is four years (with master's degree), six years (without master's degree).

### Typical Program for the Ph.D. in Music First and Second Years

| Fall   | Winter                        | Spring                |
|--|-------------------------------|-----------------------|
| <b>Composition</b>   |                               |                       |
| <i>First Year</i>  |                               |                       |
| 203A (Ph D)<br>(210)   | 203B (Ph D.)<br>(228)<br>201B | 203C (Ph D.)<br>(291) |
| (209 — four or more required for the Ph.D. degree)             |                               |                       |
| *Other   | *Other                        | *Other                |
| <i>Second Year</i>   |                               |                       |
| 203D<br>(206/207 — four or more required for the Ph.D. degree) | 299<br>201B                   | 299                   |
| 209  |                               |                       |
| *Other   | *Other                        | *Other                |

### Theoretical Studies

| <i>First Year</i>  |  |  |
|--|--|--|
| †232/203/205A<br>(201A)<br>(210)<br>(209 — four or more required for the Ph.D. degree) | †232/203/205B<br>201B<br>(228)<br>*Other | †232/203/205C<br>(201C)<br>(291)<br>*Other |
| <i>Second Year</i>   |  |  |
| 206 (232)<br>††(206/207 — four or more required for the Ph.D. degree)                  | 299<br>201B<br>*Other                    | 299<br>*Other                              |

\*Other courses and activities include electives, Music 500, Music 143, departmental colloquia, and concerts.

†Students emphasizing performance should take the 232 sequence, those emphasizing composition the 203 sequence, and those with computer music emphasis should take the 205 sequence.

††Doctoral students emphasizing computer music may replace one 206/207 requirement with three 205's, or two 206/207's with four 205's.

### First and Second Years (Third if necessary) (see charts above)

Eight approved seminars and a publishable paper (plus 201A-B-C, 210, 228, and 291 if required)\* \*

Additional courses for breadth

Six units of Music 500 (if not already completed)

Music 143 every quarter

### Third and Fourth Years (Fifth if necessary)

Written and oral qualifying examination

Dissertation writing

Dissertation defense

\* \*cf., above under 1.

## Courses

NOTE: These course offerings outline the general scope of our program. Not all courses are offered every year. It is essential that students work closely with departmental advisers when planning their degree programs.

## Lower Division

### 1A-B-C. Musical Literacy (4-4-4)

Primarily intended for students whose major is other than music, this course develops musical abilities through a conceptual understanding of the structure of music together with listening exercises and techniques. Topics include musical notation, melodic transcription, scales, chords, intervals, keys, rhythm, meter, and rudiments of musical form. (Formerly Music 3A-B-C.) *Prerequisites: none.*

### 2A-B-C. Basic Musicianship (4-4-4)

Primarily intended for students whose major is music. Intensive development of basic skills necessary for musicians. Perception and notation of pitch relationships, temporal relationships, and musical structures. Extensive drills in sight singing, rhythmic reading, and dictation. *Prerequisite: must be taken in sequence.*

### 4. Introduction to Music (4)

The development of musical perception through the direct experience of listening. Topics include sound, texture, rhythm, melody, harmony, structural functions, means of organization, and form. Listening will include examples of Western music from the Middle Ages to the present, jazz, folk music, and the music of other cultural traditions. *Prerequisites: none.*

### 5. Introduction to Music Making (4)

A one-quarter course designed to discover musical potential and expand musical experience. No knowledge of music, notation, or instrumental skill is necessary. Small lab sessions present music through composing, improvising, and performing. Results take the form of works for tape, theatre, voices, or instruments. *Prerequisites: none.*

### 7. Music, Science, and Computers (4)

An exploration of the interactions among music, science and technology, including the development and history of science and technology from the perspective of music, and the modern resynthesis of these disciplines, occurring around computers. *Prerequisites: none.*

### 8. American Music (4)

A course designed to study the development of music in America. The focus will be on both the vernacular traditions including hymn singing, country music, jazz, big band, rock, etc., as well as the cultivated traditions of various composers from William Billings to John Cage. (Formerly Music 6A.) *Prerequisites: none.*

### 9. Symphony (4)

The symphonic masterworks course will consist of lectures and listening sessions devoted to a detailed discussion of a small number of recognized masterworks (e.g., Mozart, Beethoven, Berlioz, Stravinsky, Ligeti, etc.). (Formerly Music 6B.) *Prerequisites: none.*

### 10. Chamber Music (4)

Chamber Music will consist of lectures and listening sessions devoted to a detailed discussion of recognized chamber masterworks (e.g., Haydn, Mozart, Beethoven, Bartok, etc.). (Formerly Music 6C.) *Prerequisites: none.*

### 11. Folk and Popular Music (4)

A course on folk and popular musics of the world, all geographic regions. Folk and/or popular music will be covered through lectures, films, and listening sessions devoted to detailed discussion of music indigenous to varying countries/areas of the world. *Prerequisites: none.*

### 12. Opera (4)

Opera masterworks will consist of lectures, listening labs, and films. An in-depth discussion of five operas written between 1642-1925 by Monteverdi, Mozart, Verdi, Bizet and Berg is included. (Formerly Music 6D.) *Prerequisites: none.*

### 14. Contemporary Music (4)

This course offers opportunities to prepare oneself for experiences with new music (through preview lectures), hear performances (by visiting or faculty artists), to discuss each event informally with a faculty panel: an effort to foster informed listening to the new in music. *Prerequisites: none.*

### 20A-B-C. Music Theory and Practice I (4-4-4)

An integrated and creative approach to the study of materials of music through hearing, writing, analyzing, and performing. Continues ear training. Studies in melodic writing and counterpoint. *Prerequisites: Music 5 and Music 2A-B-C.*

### 22A-B-C. Survey of Music History and Literature (4-4-4)

Intensive historical, analytical, and cultural-esthetic examination of music from Gregorian chant through the twentieth century. *Prerequisites: none. Some theory background strongly recommended.*

### 32. Instrumental/Vocal Instruction (2)

Supervised study of instrumental or vocal technique and coaching in appropriate repertoire. Students should be prepared to audition at first class meeting. *Prerequisites: intermediate skills; non-majors must be concurrently enrolled in at least one other music course, such as Music 95 ensemble or 30A-B-C. Department stamp required. May be taken for credit six times.*

### 95. Ensemble Performance (2)

Performance in an ensemble appropriate to student abilities and interests. Normally each section requires student participation for the whole academic year, with credit for participation each quarter. Music majors should enroll in at least one section each quarter. Not all sections will be offered every year. May be repeated for credit. Grading on participation level, individual testing, comparative papers on repertoire covered, etc. *Prerequisites: audition and consent of instructor for each section.*

Section A. *Symphony Orchestra*

Section B. *Clarinet Choir*

Section C. Concert Choir

Section D. Symphonic Chorus

Section E. Chamber Orchestra

Section F. Collegium Musicum

Section G. Gospel Choir

Section H. Chamber Opera (Not offered in 1987-88.)

Section I. Music Theater (Not offered in 1987-88.)

Section J. Jazz Ensemble

Section K. Chamber Singers (Not offered in 1987-88.)

Section L. Wind Ensemble

Section M. Madrigal Singers

Section N. Non-Western Music (Not offered in 1987-88.)

## Upper Division

### 101A-B-C. Music Theory and Practice II (4-4-4)

A study of the structure of homophonic tonal music. Representative examples of music literature are studied for an understanding of pitch relationships, temporal relationships, form, pattern, etc. Class time is devoted to hearing, singing, analysis, and writing. Individual drills in aural comprehension are provided in the Central University Library. *Prerequisites:* Music 2A-B-C. All transfer students must pass a proficiency test of Music 2A-B-C before enrolling in Music 101.

### 102A-B-C. Music Theory and Practice III (4-4-4)

Advanced study of the materials of music. Wagner through Cage. Aural discrimination, analysis, exercises, short compositions. *Prerequisites:* Music 20A-B-C; Music 101A-B-C.

### 103A-B-C-D-E-F. Seminar in Composition (4-4-4-4-4-4)

Individual projects in composition critically reviewed in seminar with fellow student and faculty composers. Department stamp required. *Prerequisites:* Music 20A-B-C; Grade of A or B in 103C to go on to 103D. Department stamp required.

### 104. Basic Electroacoustics (4)

An introduction to the acoustics of music and to modern techniques of recording sound. *Prerequisites:* Music 2A-B-C or 3A-B-C and consent of instructor. (F)

### 105. Electronics in Music (4)

Seminars in theoretical and applied research in the generation and processing of electronic sound for composition and performance. *Prerequisites:* Music 104 and consent of instructor.

### 106. Musical Psychoacoustics (4)

(Same as Psychology 184.) Survey of psychoacoustical phenomena, theories of hearing and their relation to musical perception and cognition. Techniques of psychoacoustical experimentation. *Prerequisite:* consent of instructor; Music 104 recommended.

### 107A-B-C. Advanced Projects in Music Electronics (4-4-4)

Independent or group projects undertaken in theory, performance, or composition and requiring use of electronic devices. Dependent upon approval and ongoing evaluation of a faculty member. Offered only as demand and faculty availability justifies.

### 111. World Music (4)

A course of illustrated lectures giving an introduction to and brief summary of selected musics of the world.

### 112. Studies in Vocal and Choral Literature (4)

A critical study of representative works for solo voice (with piano or other accompaniment) and/or for choral ensemble. Since the selected literature will vary from year to year, the course can be repeated for elective credit. Music majors are assigned additional projects. *Prerequisites:* none. Music 4, 6, 7, or 22 recommended, or consent of instructor. (Not offered in 1987-88.)

### 113. Studies in Opera (4)

A critical study of representative operas. At least one opera discussed will be selected because of the opportunity to see it in staged performance. Music majors are assigned additional projects. *Prerequisites:* none. Music 4, 6, 7, or 22 recommended, or consent of instructor. (Not offered in 1987-88.)

### 114. Music of the Twentieth Century (4)

An exploration of materials and methods used in the music of our time. There will be an extra discussion group for music

majors. May be repeated once for credit. *Prerequisites:* none. Music 4, 6, 7, or 22 recommended, or consent of instructor.

### 115. Women in Music (4)

(Same as History 115.) An historical survey of women musicians from the Middle Ages to today. The course will deal with an historical view of women's place as creative and representative artists, the societal and political influences that governed their existence and their music. *Prerequisite:* consent of instructor.

### 116. Medieval and Early Renaissance Music (4)

The development of an operational and intellectual account of medieval and early Renaissance music. Music majors are assigned additional projects. *Prerequisites:* none. Music 4, 6, 7, or 22 recommended. (Not offered in 1987-88.)

### 117. Late Renaissance and Early Baroque Music (4)

Functional performance problems and realizations of music of the sixteenth and seventeenth centuries. Music majors are assigned additional projects. *Prerequisites:* none. Music 4, 6, 7, or 22 recommended. (Not offered in 1987-88.)

### 118. Music of the Classic Era (4)

Main emphasis will be placed on the music of Haydn, Mozart, and Beethoven and general culture of the period. Listening assignments shall be two to four hours with scores. Lectures shall include analysis of specific works together with presentation of interesting topics based on melody, harmony, counterpoint, and rhythm of the period. *Prerequisites:* none. Music 4, 6, 7, or 22 recommended. (Not offered in 1987-88.)

### 119. Music of the Nineteenth Century (4)

A critical study of European Art Music produced during the romantic period. Stress will be placed on the rise of nationalism and its effects upon the music. *Prerequisites:* none. Music 4, 6, 7, or 22 recommended. (Not offered in 1987-88.)

### 122. Music Drama (4)

In-depth analysis of the music and lyrics of important figures from the history of music theatre. Topics will vary each quarter, but may include aspects of interpretation, production, direction and design, and will be integrated with musical analysis. *Prerequisites:* none. (Not offered in 1987-88.)

### 123. The Orchestra and Its Literature (4)

A study of the instruments of the orchestra: their resources; tonal effects; their use by major composers; methods of writing for modern instruments; analysis of representative scores. Music majors are assigned additional projects. *Prerequisites:* Music 4, 6, 7, or 22 recommended, or consent of instructor. (Not offered in 1987-88.)

### 124. Studies in Chamber Music (4)

A critical study of representative works for small ensemble. The literature studied is selected and may vary from course to course. Music majors are assigned additional projects. *Prerequisites:* Music 4, 6, 7, or 22 recommended, or consent of instructor. (Not offered in 1987-88.)

### 126. Introduction to Oral Music (4)

An introductory course in the study of oral music in Western and non-Western cultures with particular emphasis on the impact of oral transmission of ideas and customs, and the nature of improvisation in various indigenous cultures. Music to be studied includes Afro-American, African, Asian, and Oceanian. Presentations by distinguished visiting artists demonstrating aspects of their native musical crafts. *Prerequisite:* upper-division standing or consent of instructor.

### 127A-B. Music of Black Americans (4-4)

The first quarter of this course will investigate the vocal music of black American culture, primarily the development of the spiritual and the blues traditions, while the second quarter will critically study the history of jazz in America. *Prerequisites:* none.

### 128. Principles and Practice of Conducting (4)

The theory and practice of instrumental and/or choral conducting as they have to do with basic baton techniques, score reading, interpretation, orchestration, program building, and functional analysis. Members of the class will be expected to demonstrate their knowledge in the conducting of a small ensemble performing literature from the eighteenth, nineteenth, and twentieth centuries. *Prerequisites:* Music 20A-B-C and 101A-B-C.

### 130. Advanced Chamber Music Performance (2-4/0)

Advanced instruction in the preparation of small group per-

formances of representative instrumental and vocal chamber music literature. May be taken for credit six times after which students must enroll for 0 units. *Prerequisite:* consent of instructor through audition.

### 131. Jazz Improvisation (4/0)

An extensive study of jazz improvisation including performance techniques, concepts, and styles. Students' theoretical knowledge will be applied to their instruments, and a repertory of melodic and harmonic devices will be mastered. Also covered will be jazz soloing, demands of melodic/harmonic innovations and modes of chord changes or progressions. May be taken for credit six times after which students must enroll for 0 units. *Prerequisites:* basic knowledge of major-minor scales and major, minor and dominant seventh chords on respective instruments. Basic functional keyboard techniques.

### 132. Pro-Seminar in Music Performance (4)

Individual or master class instruction in advanced instrumental/vocal performance. May be repeated for credit, but only 24 units will be counted within the 180-unit requirement for graduation. *Prerequisite:* consent of instructor through audition. Preference given to music majors and some approved music minors.

### 132R. Recital Preparation (4)

Advanced instrumental/vocal preparation for senior music majors pursuing honors in performance. Repertoire for a solo recital will be developed under the direction of the appropriate instrumental/vocal faculty member and a committee of two additional music faculty. Special audition required during Welcome Week preceding fall quarter. *Prerequisite:* by audition only; Music 132.

### 133. Projects in New Music Performance (2)

Performance of new music of the twentieth century. Normally offered winter quarter only. May be taken four times for credit. *Prerequisite:* consent of instructor through audition. (Winter quarter only.)

### 143. Department Seminar (1)

The department seminar serves both as a general department meeting and as a forum for the presentation of research and performances by visitors, faculty, and students. Required of all graduate and undergraduate music majors every quarter.

### 195. Instructional Assistance (2)

Assisting in the instruction of an undergraduate music class under the direct and constant supervision of a faculty member. May be taken for credit three times. *Prerequisites:* consent of instructor and departmental approval.

### 198. Directed Group Study (1-4)

Concentrated inquiry into various problems not covered in the usual undergraduate courses. *Prerequisite:* consent of instructor.

### 199. Independent Study (2 or 4)

Independent reading, research, or creative work under the direction of a faculty member, provided no course covering the material to be studied already exists, and the study area derives from previous course work. *Prerequisites:* consent of instructor and departmental approval. May be taken for credit three times.

## Graduate

### 201A-B-C. Projects in New Music Performance (1-4, 1-4, 1-4)

Performance of new music of the twentieth century. All performance emphasis graduate students must take every quarter. (Please note that Lab. 2 is intended for students participating in the Twentieth-Century Ensemble.) Non-performance students must take 201B during two winter quarters.

### 203A-B-C. Advanced Projects in Composition (4-4-4)

Seminar consisting of meetings and laboratory sessions devoted to the study of composition.

### 203D. Advanced Projects in Composition (4)

Individual studies in composition with a member of the composition faculty. Offered only as demand and faculty availability justifies.

### 205A-B-C. Computer Music (4-4-4)

The principles and practice of computer music including a

## NEUROSCIENCES

broad treatment of the fundamental principles on which computer music is based (computer programming, digital signal processing, and sound synthesis). Includes use of the CARL system at CME for the construction of computer music. Limited enrollment. *Prerequisites: Music 104, 105, 106 or equivalent plus consent of instructor.*

### 205D. Computer Music (4)

Individual instruction in the principles and practice of computer music, including a broad treatment of the fundamental principles on which computer music is based (computer programming, digital signal processing, and sound synthesis). Limited enrollment. *Prerequisites: Music 205A-B-C plus consent of instructor.*

### 206. Experimental Studies Seminar (4)

Seminars growing out of current faculty interests. The approach tends to be speculative and often includes individual projects as well as assigned readings. In the past, such areas as new instrumental and vocal resources, mixed media, and compositional linguistics have been offered.

### 207. Theoretical Studies Seminar (4)

Seminars on subject areas relating to the established dimensions of music and in which theoreticians have produced a substantial body of work. These include studies in analysis, timbre, rhythm, notation, and psychoacoustics. Offerings vary depending on faculty availability and interest.

### 209. Advanced Music Theory and Practice (4)

Advanced integrated studies in music theory; composition and styles study through analysis and performance. This course is intended primarily for doctoral students and may be taken by M.A. students only with special approval of M.A. adviser and course instructor.

### 210. Musical Analysis (4)

The analysis of complex music. The course will assume that the student has a background in traditional music analysis. The goal of the course is to investigate and develop analytical procedures that yield significant information about specific works of music, old and new. Reading, projects, and analytical papers.

### 212. Seminar in Vocal and Choral Literature (4)

A critical and historical study of selected works and repertory. (Not offered in 1987-88.)

### 213. Opera Studies (4)

A detailed analytical study of selected operas in production in San Diego, Los Angeles, or San Francisco. *Prerequisite: consent of instructor.* (Not offered in 1987-88.)

### 214. Seminar in Twentieth-Century Music (4)

Detailed study of selected literature through the study of scores and writings, supplemented when possible by performance participation.

### 215. Seminar in Bach and Related Studies (4)

A study of content and structure in selected compositions of J. S. Bach. *Prerequisite: consent of instructor.* (Not offered in 1987-88.)

### 216. Medieval Music (4)

Readings, studies, and performance problems of medieval music from antiquity to the beginning of the Renaissance. Problems of tuning, language, source materials, and media esthetics are incorporated. (Not offered in 1987-88.)

### 217. Seminar Studies in Late Renaissance and Early Baroque Music (4)

The study of early music as it has to do with theoretical systems, critical analyses, music and documentary source materials.

### 222. Music Drama (4)

In-depth analysis of the music and lyrics of important figures from the history of music theatre. Topics will vary each quarter, but may include aspects of interpretation, production, direction and design, and will be integrated with musical analysis. (Not offered in 1987-88.)

### 223. Seminar Studies in Orchestral Literature (3)

Problems of performance and interpretation in representative works of orchestral music, including works for chamber orchestra, opera scenes, and choral works. Students will be responsible for problems of editing, bowings, and conducting.

### 224. Seminar Studies in Chamber Literature (4)

A critical and historical study of selected works and repertory. (Not offered in 1987-88.)

### 228. Conducting (4)

This course will give practical experience in conducting a variety of works from various eras of instrumental and/or vocal music. Students will study problems of instrumental or vocal technique, formal and expressive analysis of the music, and manners of rehearsal. Required of non-performance graduate students. *Prerequisite: consent of instructor.*

### 230. Advanced Seminar in Performance of Music for Small Ensemble (4)

Performance of representative chamber music literature, instrumental and/or vocal, through coached rehearsal and seminar studies. Course may be repeated for credit, since the literature studied varies from quarter to quarter. *Prerequisite: consent of instructor.*

### 232. Pre-Seminar in Music Performance (4)

Individual or master class instruction in advanced instrumental/vocal performance. *Prerequisite: consent of instructor through audition.*

### 236. Chamber Orchestra (4)

Study and performance of standard orchestra literature in coached rehearsal sessions. A high standard of performance must be demonstrated. This course may be repeated for credit any number of times. The literature performed varies from year to year and quarter to quarter. *Prerequisite: consent of instructor through audition.* (Not offered in 1987-88.)

### 237. Opera Studio (4)

Study and performance of scenes from standard, classic operas, experimental music theatre, and chamber operas. *Prerequisite: consent of instructor through audition.* (Not offered in 1987-88.)

### 256. Advanced Computer Music Seminar (1-4)

Advanced seminar in computer applications to music including topics in sound synthesis, modification and analysis, compositional algorithms, computer-mediated performance, and related issues of musical data structures and algorithms, musical signal processing, and psychoacoustics. Offerings and units vary according to faculty availability and interests. *Prerequisites: Music 205A-B-C or equivalent plus consent of instructor.*

### 291. Problems and Methods of Music Research and Performance (4)

The course will give practical experience in historical research including use of important source materials, evaluation of editions, and examination of performance practice problems. (Spring)

### 298. Directed Research (1-4)

Individual research. (S/U grades permitted.) May be repeated for credit.

### 299. Advanced Research Projects and Independent Study (1-12)

Individual research projects relevant to the student's selected area of graduate interest conducted in continuing relationship with a faculty adviser in preparation of the master's thesis or doctoral dissertation. (S/U grades permitted.)

### 500. Apprentice Teaching (1-4)

Participation in the undergraduate teaching program is required of all graduate students at the equivalent of 25 percent time for three quarters (six units).

## NEUROSCIENCES

OFFICE: 3034 Basic Science Building,  
School of Medicine

### Professors:

Darwin K. Berg, Ph.D. (*Biology*)  
Reginald G. Bickford, M.D.  
(*Emeritus/Neurosciences*)

Floyd E. Bloom, M.D. (*Adjunct/Neurosciences and Psychiatry*)  
Theodore H. Bullock, Ph.D. (*Emeritus/Neurosciences*)  
Nelson Butters, M.D., Ph.D. (*Psychiatry*)  
J. Anthony Deutsch, Ph.D. (*Psychology*)  
John W. Evans, Ph.D. (*Mathematics*)  
Edmund J. Fantino, Ph.D. (*Psychology*)  
Robert Galambos, M.D., Ph.D. (*Emeritus/Neurosciences*)  
J. Christian Gillin, M.D. (*Psychiatry*)  
Philip M. Groves, Ph.D. (*Director of the Graduate Program, Psychiatry*)  
Walter F. Heiligenberg, Ph.D. (*Behavioral Physiology*)  
Steven A. Hillyard, Ph.D. (*Neurosciences*)  
Harvey J. Karten, M.D. (*Neurosciences and Psychiatry*)  
Robert Katzman, M.D. (*Neurosciences, Chair*)  
Daniel F. Kripke, M.D. (*In Residence/ Psychiatry*)  
William B. Kristan, Ph.D. (*Biology*)  
Robert B. Livingston, M.D. (*Neurosciences*)  
Arnold J. Mandell, M.D. (*Psychiatry*)  
Arnold L. Miller, Ph.D. (*In Residence, Director of Graduate Studies/ Neurosciences*)  
R. Glenn Northcutt, Ph.D. (*Neurosciences*)  
John S. O'Brien, M.D. (*Neurosciences*)  
Stuart Patton, Ph.D. (*Adjunct/ Neurosciences*)  
Morton Printz, Ph.D. (*Medicine*)  
George S. Reynolds, Ph.D. (*Psychology*)  
Michael G. Rosenfeld, M.D. (*Medicine*)  
David S. Segal, Ph.D. (*Psychiatry*)  
Allen I. Selverston, Ph.D. (*Biology*)  
Nicholas C. Spitzer, Ph.D. (*Biology*)  
Charles E. Spooner, Ph.D. (*Neurosciences*)  
Larry R. Squire, Ph.D. (*In Residence/ Psychiatry*)  
Larry W. Swanson, Ph.D. (*Adjunct/ Neurosciences*)  
Paula Tallal, Ph.D. (*In-Residence/ Psychiatry*)  
Palmer W. Taylor, Ph.D. (*Medicine*)  
Robert D. Terry, M.D. (*Neurosciences and Pathology*)  
Robert D. Tschirgi, M.D., Ph.D. (*Neurosciences*)  
Wylie Vale, Ph.D. (*Adjunct/Medicine*)  
Silvio S. Varon, M.D., Eng.D. (*Biology*)  
W.C. Wiederholt, M.D. (*Neurosciences*)  
Samuel S.C. Yen, M.D. (*Reproductive Medicine*)

### Associate Professors:

Joan Heller-Brown, Ph.D. (*Medicine*)  
Eric Courchesne, Ph.D. (*In-Residence/ Neurosciences*)

Mark H. Ellisman, Ph.D. (*Neurosciences*)  
 Fred H. Gage, Ph.D. (*Neurosciences*)  
 Mark A. Geyer, M.D. (*Psychiatry*)  
 Paul A. Insel, M.D. (*Medicine*)  
 Vicente J. Iragui-Madoz, M.D., Ph.D.  
 (*Adjunct/Neurosciences*)  
 George F. Koob, Ph.D. (*Adjunct/  
 Psychology*)  
 Marta Kutas, Ph.D. (*In-Residence/  
 Neurosciences*)  
 Ronald Kuczenski, Ph.D. (*Adjunct/  
 Psychiatry*)  
 E. Roger Marchand, Ph.D. (*Adjunct/  
 Neurosciences*)  
 Robert R. Myers, Ph.D. (*Neurosciences  
 and Anesthesiology*)  
 Helen J. Neville, Ph.D. (*Adjunct/  
 Neurosciences*)  
 Daniel T. O'Connor, M.D. (*In-Residence/  
 Medicine*)  
 S. Craig Risch, M.D. (*Psychiatry*)  
 Leon Thal, M.D. (*Neurosciences*)  
 Doris A. Trauner, M.D. (*Neurosciences  
 and Pediatrics*)  
 Justin Zivin, M.D. (*Neurosciences*)

#### Assistant Professors:

David G. Amaral, Ph.D. (*Adjunct/  
 Neurosciences*)  
 David M. Armstrong, Ph.D. (*In Residence/  
 Neurosciences*)  
 Stephen L. Foote, Ph.D. (*Adjunct/  
 Psychiatry*)  
 Richard Haas, M.D. (*Neurosciences*)  
 Richard L. Hauger, M.D. (*Psychiatry*)  
 Stephen F. Heinemann, Ph.D. (*Adjunct/  
 Neurosciences*)  
 Tsunao Saitoh, Ph.D. (*Neurosciences*)  
 Dipak K. Sarkar, Ph.D. (*In Residence/  
 Reproductive Medicine*)  
 Clifford Shults, M.D. (*Neurosciences*)  
 Ajit Varki, M.D. (*Medicine*)

\* \* \*

## The Graduate Program

The group in the neurosciences accepts for the Ph.D. degree candidates with undergraduate majors in such disciplines as biology, chemistry, engineering, microbiology, mathematics, physics, psychology, and zoology. A desire and competence to understand how the nervous system functions is more important than previous background and training.

## DOCTORAL DEGREE PROGRAM

Students in this program receive guidance and instruction from a campus-wide group of faculty interested in nervous system mechanisms. Each student, in consultation with a faculty committee, selects courses relevant to his or her interests and goals which also provide a solid ground-

ing in the several disciplines of preclinical neurosciences. The selection will include formal courses listed in this catalog and informal seminars offered by the department. Close association among students, faculty, and postdoctoral personnel adds to this informal, tutorial type of instruction. A regular schedule of rotation through the laboratories of faculty members is a feature of the first year; the student is exposed in this way to the various approaches, techniques, and disciplines represented on the campus. A period of study at one of the other campuses of the University of California can be arranged by mutual agreement.

## Course Work

There are no formal course requirements for the Ph.D. degree. However, by the time of the minor proposition (see below), students are expected to demonstrate competence through written examination in at least four of the following areas of neuroscience: anatomy, physiology, chemistry, pharmacology, development, and behavior. The faculty offers core courses in all of these areas, and students frequently demonstrate minimal competence in an area by enrolling in the appropriate course and passing its final examination. Students are permitted to substitute an area of neurosciences not currently designated a core area for competency; e.g., neuroendocrinology. Such a substitution would require approval by the graduate director.

## Minor Proposition

The purpose of this examination is to test the student's ability to choose a problem in the neurosciences and propose an experimental approach to its solution. The problem should be broad, requiring experimental approaches from more than one discipline. The problem should be out of the area of the student's anticipated thesis research. Students will be required to demonstrate a working knowledge of the disciplines involved in the minor proposition.

Oral defense of the minor proposition will be required at the beginning of the winter quarter of the second year of study. Exemptions may be granted to entering students already holding a master's degree.

## Dissertation

During the second year students are expected to propose and initiate work on a thesis problem under the guidance of a faculty preceptor. The neurosciences

group at UCSD presently conducts animal research and clinical studies in the fields of neuroanatomy, neurochemistry, neuropharmacology, neurophysiology, comparative neurology, physiology of excitable membranes, synaptic transmission, neuronal integration and coding, nervous system tissue culture, neuroimmunology, brain function, sensory physiology, motor mechanism and systems analysis as applied to neurological problems. Facilities for research on marine forms, vertebrate and invertebrate, are available.

## Qualifying Examination

This examination, a university requirement, will normally focus on the proposed research that the student will undertake for his or her thesis. Demonstration of competence in the four core areas declared earlier should have been exhibited previous to the qualifying examination, e.g., final examination scores from one or more of the core courses. The examination should be taken no later than the end of the first quarter of the third year.

## Dissertation Examination

The required formalities listed in the *Instruction for Preparation and Submission of Doctoral Dissertations* issued by the Office of Graduate Studies and Research to students should be followed closely. The final examination includes both a public presentation followed by a closed defense of the thesis with members of the committee.

## Teaching

Students are expected to teach and to develop their talents as teachers. To this end opportunities to lecture and to assist in laboratory exercises and demonstrations are provided.

## Courses

### Undergraduate

#### 199. Independent Research (2 or 4)

Laboratory research under the supervision of individual members of the faculty of the neurosciences department in one or a combination of neurosciences disciplines, e.g., neuroanatomy, neurophysiology, neurochemistry, neuropharmacology. (P/NP grades only.) *Prerequisite:* consent of department chairman. (F,W,S)

### Graduate

#### 227. Neurosciences Concept (2)

Analytical, critical, and creative discussions of neurosciences phenomena and concepts. Entire quarter is devoted to one problem area, e.g., brain mechanisms involved in perception, memory, visceral regulation, development, etc., with attempt to establish improved theoretical and experimental approaches. (S/U grades only.) (W)



## PHILOSOPHY

### 233. Comparative Neurobiology (4)

Survey of the organization and evolution of vertebrate nervous systems. *Prerequisite: consent of instructor.* (S/U grades only.) (F)

### 234. Molecular and Cellular Neurochemistry (4)

Topics include membrane and nerve function in nervous system, structure and function of receptors for neurotransmitters, role of cAMP as a second messenger in the nervous system, synthesis and processing of neuropeptides. (S/U grades only.) (W)

### 243. Physiological Basis of Human Information (2)

Psychological processes including attention, perception, and memory will be studied in connection with event-related potentials of the human brain. The interrelations among psychological and physiological events will be explored in order to arrive at unified concepts of human information processing. *Prerequisites: Neurosci. 238 or Psych. 231, and consent of instructor.* (S/U grades only.) (F)

### 246. Advanced Neuroanatomy (4)

The purpose of this course is to present selected advanced topics in the anatomy of the nervous system. It will emphasize the organization of functional systems but consideration of neural ultrastructure and growth and development will be included. (S/U grades only.) (S)

### 249. History of Medicine (1)

The course examines the causes of conceptual progress and advances in medicine as well as the historical relations between medicine and society. (S/U grades only.) (F)

### 251. Scientific Communication (2)

Forms of scientific communication, practical exercise in scientific writing and short oral communication, and in criticism and editing, preparation of illustrations, preparation of proposals; scientific societies, and the history of scientific communication. Emphasis on examples from neuroscience. *Prerequisite: consent of instructor.* (S/U grades only.) (F)

### 252. Information Processing in Man (1)

Reports of ongoing research into human information with emphasis on electrophysiological changes during attention to, and perception and comprehension of visual, auditory, and somatic stimuli.

### 253. Clinical Neuroanatomy (1)

Review of neuroanatomy with emphasis on clinical correlations. Pertinent physiological, chemical and clinical information will be included, and functional organization will be stressed. It is essential that students be familiar with neuroanatomical nomenclature. *Prerequisite: medical student, graduate student, intern, resident, or consent of instructor.* (S/U grades only.)

### 256. Mammalian Neuroanatomy (4)

Lectures and laboratory presenting the basic features of the anatomy of the mammalian nervous system. This will include consideration of cellular components, development, topographic anatomy, and a detailed presentation of the organization of functional systems. *Prerequisite: graduate status or consent of instructor.* (S/U grades only.) (F)

### 258. Fundamentals of Cerebral Circulation Metabolism (1)

Structure and function of the cerebral circulation will be presented with emphasis placed on the microcirculatory basis of clinical phenomena. Normal and pathophysiological perturbations in the couple between metabolism and blood flow will be explored. *Prerequisite: Basic Neurology, Neurosci. 238, or consent of instructor.* (S/U grades only.) (W)

### 259. Workshop in Electron Microscopy (4)

This course is to introduce graduate students in the neurosciences to research methods used in electron microscopy (EM) through one hour of formal lecture, one hour of seminar, three hours of demonstration, and three hours of supervised laboratory work per week. Students will become familiar within sectioning EM, scanning EM, and freeze-fracture EM. *Prerequisites: graduate-student standing in neurosciences doctoral program and consent of instructor. Enrollment limited.* (S/U grades only.) (S)

### 260. Development of the Nervous System (4)

This course will examine development of the vertebrate nervous system, with an emphasis on basic human neuroembryology. Topics will include neural tube and crest formation; histogenesis, differentiation, and synaptogenesis in nuclear and cortical structures; maturation of metabolic and neuro-

transmitter functions; and hormonal influences on neural development. *Prerequisite: graduate or medical student or consent of instructor.* (S/U grades only.) (W)

### 262. Neurophysiology (4)

An overview of neurophysiological systems, emphasizing mammalian neurophysiology and related model vertebrate systems and concepts. *Prerequisites: graduate student status in neurosciences, biology or physiology-pharmacology, or medical student, core course in neurophysiology and core course in neuroanatomy or equivalent.* (S/U grades permitted.) (S)

### 263. Advanced Cellular Neurobiology (3)

(Same as Biology 258.) Cellular and developmental aspects of the nervous system. Methods of investigation and culture approaches. Basic neuroembryology and selected examples of regional developments. Neuroglial cells and neuron-glia interactions. Extrinsic controls of survival growth and maturation of neural cells. Neurite growth and synapse formation. Potential for plasticity and regeneration in the nervous system. *Prerequisite: graduate students or consent of instructor.* (S/U grades only.) (F) (Not offered in 1987-88.)

### 264. Behavioral Neuroscience (5)

The course is to cover different areas of behavioral biology such as: ethology, behavioral biology, learning and memory, perception psychophysics. Some outside reading will be required. *Prerequisite: medical student, graduate student, or consent of instructor.* (S/U grades only.) (S)

### 265. Neuropharmacology and Receptor Mechanisms (3)

(Same as Physiology/Pharmacology 230.) An examination of the molecular and biochemical bases of drug and neurotransmitter action. The fall-quarter course is devoted to receptor mechanisms, neuropharmacology, and drug action on excitable tissues. *Prerequisite: course in biochemistry.* (S/U grades only.) (F)

### 268. Molecular and Cellular Neuroanatomy (3)

An examination of nervous systems, emphasizing dynamic properties of cells. The dynamic aspects of cell systems and organelles responsible for cell form, cellular movements, functional membrane asymmetry, protein synthesis, packaging of materials for export, neuroplasmic transport, ionic equilibria, and energy metabolism as well as membrane molecular organization of interactions at cellular junctions will be considered. *Prerequisites: neurochemistry, neuroanatomy, biochemistry.* (S/U grades only.) (S)

### 269. Electroencephalography and Clinical Neurophysiology (1)

Using the *Journal of Electroencephalography and Clinical Neurophysiology*, as a core text, subjects chosen from the journal will be discussed and critically evaluated by the participants, and the literature pertinent to each topic reviewed. *Prerequisites: Neurosci. 238, Basic Neurology (205), neurology resident, or consent of instructor.* (F,W,S)

### 270. Morphologic Neurology (2)

A review of human gross neuroanatomy will be followed by study of microscopic neuroanatomy and neuropathology. The course will give medical students, residents, and/or graduate students, a brief view of the morphology of the nervous system in health and disease. *Prerequisites: need to know human neuroanatomy and pathology; experience in at least one microscopic morphology course, and consent of instructor.* (S/U grades only.)

### 272. Basic Mechanisms of Neurological Diseases (2)

The aim of this course is to review the pathogenetic mechanisms of major categories of neurological diseases and to examine ongoing research that is relevant for their understanding. It is intended for graduate and medical students who plan careers of basic research in the neurosciences. Emphasis is placed in establishing a link between the basic research and clinically relevant problems. A few selected copies are chosen each year and are discussed by investigators actively conducting research in these areas. *Prerequisite: medical or graduate student, or consent of instructor.* (S/U grades only.) (F)

### 273. Health Hazards in the Nuclear Age (2)

(Same as Radiology 222.) Provides instruction in medical, biological, and ecological effects of ionizing radiation. It analyzes benefits and risks involved in research and health professions, industry and military; the health hazards associated with nuclear power plants, nuclear deterrence, and disposal of nuclear wastes. (F)

### 274. Neurobiology of Cognitive Developmental Disorders (2)

Neurobiological foundation of developmental disorders in information processing including infantile autism, developmental dysphasia, attention deficit disorder, and childhood schizophrenia. Neurophysiological, neuroanatomical, and psychological evidence will be explored. *Prerequisite: undergraduate or graduate course in neurobiology.* (S/U grades permitted.) (W)

### 275. Anatomical Basis of Clinical Neuropharmacology (2)

This course will focus on our knowledge of sites of drug action as a means to infer the anatomical and mechanistic substrates for various neurological disorders and their treatments. (S/U grades permitted.) (S)

### 276. Neuroscience Research Rounds (2)

Third to fifth year graduate students will present their research for faculty and student criticism. Attendance will be mandatory for first and second year Neuroscience graduate students. At least two faculty members will be present. (S/U grades only.) (F,W,S)

### 277. Neuropsychopharmacology (4)

An examination of the molecular and biochemical bases of drug and transmitter action. The course is devoted to receptor mechanisms, neuropharmacology, and drug action on excitable tissues. (W)

### 296. Neurosciences Independent Research (1-12)

Independent study. (S/U grades only.) (F,W,S)

### 298. Neurosciences Independent Study Project (ISP) (1-12)

*Prerequisite: approved ISP proposal.* (F,W,S)

### 299. Neurosciences Research (1-12)

Independent study. (S/U grades only.) (F,W,S)

### 401. Neurology General Clinical Selective Clerkship (7)

Provides opportunities for practical application of neurologic skills to the understanding and treatment of a variety of clinical disorders of the nervous system. *Prerequisite: successful completion of first two years of medical school.* (F,W,S)

### 425. Subinternship in Neurology (7)

The subinternship involves the primary care of hospitalized neurology patients under the direct supervision of a neurology resident and attending physician. Subinterns are expected to assume total primary care of their patients, to perform all procedures and to participate in night call, daily neurology teaching rounds and weekly Grand Rounds. *Prerequisite: Neurology 401 or consent of instructor.* (S/U grades only.)

### 426. Subintern Pediatric Neurology (7)

Subinterns are responsible for the primary care of hospitalized pediatric neurology patients under direct resident and attending physician supervision. They will perform procedures such as lumbar puncture and participate in night call, daily teaching rounds, neurology Grand Rounds and Journal Clubs. *Prerequisite: Neurology 401 or consent of instructor.* (F,W,S)

### 496. Clinical Independent Study (1-12)

Independent clinical study for medical students. (S/U grades only.) (F,W,S)

### 500. Apprenticeship Teaching (1-4)

Participation in the departmental teaching program is required of all students working toward a Ph.D. degree. In general, students are not expected to teach in the first year, but are required to serve as teaching assistants or tutors for one quarter at any time during their subsequent years of training. The amount of teaching required is equivalent to the duties expected of a 50 percent teaching assistant for one quarter. *Prerequisite: neurosciences graduate students.* (S/U grades only.) (F,W,S)

## PHILOSOPHY

OFFICE: 3108 Humanities/  
Undergraduate Library Building,  
Revelle College



**Professors:**

Henry E. Allison, Ph.D.  
 Paul M. Churchland, Ph.D. (*Chairman*)  
 Patricia Smith Churchland, B.Phil.  
 Gerald D. Doppelt, Ph.D.  
 Philip S. Kitcher, Ph.D.  
 Edward N. Lee, Ph.D.  
 Stanley W. Moore, Ph.D. (*Professor Emeritus*)  
 Frederick A. Olafson, Ph.D.  
 Stephen P. Stich, Ph.D.  
 Avrum Stroll, Ph.D.  
 Zeno Vendler, Ph.D.

**Associate Professors:**

George H. Anagnostopoulos, Ph.D.  
 Richard J. Arneson, Ph.D.  
 S. Nicholas Jolley, Ph.D.  
 Patricia W. Kitcher, Ph.D.  
 Robert B. Pippin, Ph.D.

**Assistant Professors:**

Paolo M. Dau, Ph.D.  
 Elisabeth A. Lloyd, Ph.D.

**Introduction to the Department**

Philosophy is the study of conceptual problems that pertain to the nature of knowledge, reality, and human conduct. Among the chief areas of the subject are logic, metaphysics, theory of knowledge, ethics, political philosophy, and the philosophy of science. The academic study of philosophy at UCSD emphasizes a sound understanding of the history of the discipline and the development of analytical skills, and an undergraduate major in philosophy may be regarded as an excellent preparation for many careers in which such skills are emphasized.

The Department of Philosophy also offers a graduate program leading to the M.A. and Ph.D. degrees. It is the intention of the graduate program to enable the student to obtain an understanding of divergent philosophical traditions and to develop as a philosopher in his or her own right. To this end, the department offers courses and seminars in the history of philosophy, philosophy of language, philosophy of mind, philosophy of science, ethics, social philosophy, contemporary Anglo-American and European philosophy, etc.

**Undergraduate Program — Major**

The Department of Philosophy offers the degree of bachelor of arts (B.A.) in philosophy for the undergraduate major.

Students who wish to major in philoso-

phy are advised to begin their study of philosophy with the 31, 32, 33 sequence.

The following courses are required of philosophy majors:

1. Philosophy 31, 32, 33 (History of Philosophy)
2. Twelve upper-division courses in philosophy. These will include Philosophy 110 (Symbolic Logic I) and at least three additional courses in the history of philosophy to be selected from the series Philosophy 101-107. With the approval of the undergraduate adviser, up to two upper-division courses from outside the Department of Philosophy, but in fields of study that are closely related to the student's philosophical interests, may be used to count toward satisfaction of this requirement.

Special and independent studies courses (including courses numbered 199) may not be used to satisfy major requirements. Major requirements may be met by examination. It is required that a passing grade and an overall average of 2.0 must be obtained in courses taken at UCSD fulfilling the major requirements before certification of completion will be granted. Major requirements are not fulfilled by courses in which a grade of D is obtained.

It should be noted that a grade of pass does not count toward fulfillment of departmental requirements for either the major or the minor.

**Honors Program**

The Department of Philosophy offers an Honors Program for outstanding students in the major. Candidates who have a 3.7 GPA in philosophy (3.25 overall) at the end of their junior year and who have taken at least four upper-division philosophy courses are eligible to apply. Students interested in participating in the Honors Program should consult with a faculty sponsor before April 15 of their junior year. Admission to the program requires nomination by the sponsor and approval of the department faculty.

In addition to the usual major requirements for graduation, an honors student is required to present a senior honors thesis at the end of winter quarter. During the fall and winter quarters, the student will engage in thesis research (Philosophy 196A and 196B), supervised jointly by the faculty sponsor and the undergraduate adviser. The award of "Philosophy Honors" is based upon the successful completion of Philosophy 196A, 196B and the

senior honors thesis. Honors students are expected to maintain an average of 3.7 or better for all work taken in the program.

**Transfer Students — Procedure to Verify Acceptability of Courses**

Courses taken at another institution may be used in satisfaction of major requirements, with the approval of the department. This approval is obtained by completing a petition, obtainable from the department office, and returning it to the undergraduate adviser.

**Undergraduate Program — Minor**

With the exception of Warren College, minor requirements are satisfied by any six courses, at least three of which must be upper-division. Warren College offers its own minor programs in philosophy. A list of possible Warren minor programs in philosophy can be obtained from the college office. With the approval of the undergraduate adviser, courses may be substituted for those included in the Warren programs.

**Advising Office**

Students who desire additional information concerning our course offerings or program may contact individual faculty or the undergraduate adviser through the department office at 3108 Humanities-Library Building, (619) 452-3070. Prior to enrolling, students may wish to stop by the department and pick up a copy of the Course Offerings brochure prepared every quarter. The brochure contains course descriptions written by each instructor, as well as brief statements by our teaching faculty concerning their background and interests.

**The Graduate Program**

The Department of Philosophy offers programs leading to the M.A. and Ph.D. There is no sequence of required courses in either program. Courses of study are arranged according to the need, interest, and experience of the individual student.

It is the intention of the graduate program to enable the student to obtain an understanding of divergent philosophical traditions and to develop as a philosopher in his or her own right. To this end, the department offers courses and seminars in the history of philosophy and in the study, from a variety of perspectives, of tradi-

## PHILOSOPHY

tional and contemporary philosophical issues.

### MASTER'S DEGREE PROGRAM

An M.A. is offered under the Preliminary Examination Plan. Under this plan, credit must be obtained for thirty-six quarter-units; at least fourteen units must be from graduate courses in philosophy; no more than nine units may be from upper-division courses. In addition, an M.A. student must pass one of the three written preliminary examinations given to the Ph.D. candidates. This exam must be passed prior to the conclusion of the seventh quarter in residence.

Candidates for an M.A. degree must demonstrate reading proficiency in one foreign language (Classical Greek, Latin, French, or German).

### DOCTORAL DEGREE PROGRAM

**I. Course Work.** During the first two years of residence the student's course work will normally total thirty-six units (nine courses) per year. At least twelve of these units in each year must be graduate philosophy seminars (those numbered 201-285). The balance may be made up from additional graduate courses in philosophy, upper-division courses in philosophy (those numbered 101-199), approved upper-division or graduate courses in related departments, and, if the student is a teaching assistant, Philosophy 500.

Before the beginning of each term, and especially before the fall term, students are required to have their course choices approved by an assigned adviser. Courses should be chosen with an eye toward preparing for the comprehensive examinations.

#### II. Logic Requirement

Unless the student's undergraduate work has already covered the material adequately, the student must pass 110 with at least a B+ by the end of the third term. And the student must pass 111 or 112 with at least a B by the end of the sixth term.

#### III. Comprehensive Exams

At the beginning of the fourth quarter of residence, students will write a comprehensive examination consisting of the following three parts. Each part will be written separately, at times that will be separated by a period of not less than two days:

- i) metaphysics
- ii) epistemology
- iii) ethics

All three of these examinations will cover both historical and contemporary issues/

figures. The examinations will be tailored to the material on a permanent reading list maintained by the department, and to the material covered in graduate seminars during the immediately preceding year.

Any student who fails two or more exams on the first attempt must withdraw from the program. A failed exam must be made up by the beginning of the sixth term of residence (i.e., generally before the beginning of the spring term following the initial attempt).

#### IV. Language Requirement

All students must demonstrate reading proficiency in one of the following languages:

- German
- French
- Latin
- Classical Greek

If a student's chosen dissertation topic requires competence in a second language from the above list, then the student's dissertation adviser can require suitable demonstration of competence. The language requirement must be met before the student can be advanced to candidacy.

#### V. Third Year

i) In the third year of residence, the student must complete with a passing grade at least one regular graduate seminar in each quarter until the end of that year or admission to candidacy, whichever comes first.

ii) In the third year of residence, the student must pursue a course of study under the guidance of a two-member advisory committee, aimed at making the student familiar with the literature in the area that his or her dissertation prospectus will address. The student must approach the relevant faculty, choose the committee, and notify the graduate adviser of its membership before the beginning of the third year of residence.

#### VI. Dissertation Prospectus and Oral Candidacy Exam

Some time after passing the comprehensive examinations, the student must submit a dissertation prospectus to his or her doctoral committee. The committee will then orally examine the student on the intended subject and plan of the research. The examination will seek to establish that the thesis proposed is a satisfactory subject of research, and that the student has the preparation and the abilities necessary to complete that research. This oral qualifying examination must be attempted before the end of the tenth quarter of residence. Students who are

passed, and have met the other requirements, will be advanced to candidacy for the Ph.D.

#### VII. Teaching Requirement

Participation in undergraduate teaching is one of the requirements for a Ph.D. in philosophy. The student is required to serve as a teaching assistant for the equivalent of one-quarter time for three academic quarters. The duties of a teaching assistant normally entail grading papers and examinations, conducting discussion sections, and related activities, including attendance at lectures in the course for which he or she is assisting.

#### VIII. Doctoral Dissertation

Under the supervision of a doctoral committee, each candidate will write a dissertation demonstrating a capacity to engage in original and independent research. The candidate will defend the thesis in an oral examination by the doctoral committee. (See "Graduate Studies: The Doctor of Philosophy Degree.")

For information regarding the graduate program, write to: Graduate Adviser, Philosophy Department, B-002, UCSD, La Jolla, CA 92093.

## Courses

### Lower Division

The Department of Philosophy cooperates in the teaching and administration of the humanities sequence for Revelle College students. (See "Interdisciplinary Courses: Humanities.")

#### 1. The Nature of Philosophy (4)

What is philosophy? A study of some of the major questions with which philosophers deal, through the reading and analysis of classical and contemporary works, and with an emphasis on the way philosophy grows out of questions that in one way or another arise for almost everyone in ordinary life-situations.

#### 10. Introduction to Logic (4)

An introduction to critical thinking, and to the nature of argument, inference, and proof. How to recognize and defend against the most common forms of argumentative fallacy. How to use some of the basic techniques of modern symbolic logic: the propositional calculus. (May be used for the Warren College formal skills requirement.)

#### 12. Logic and Decision Making (4)

An introduction to the study of probability, inductive logic, and scientific reasoning. How to make rational choices between competing hypotheses and alternative courses of action when the relevant evidence is incomplete or uncertain. (May be used for the Warren College formal skills requirement.)

#### 13. Introduction to Philosophy: Ethics (4)

An inquiry into the nature of morality and its role in personal and social life. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

#### 14. Introduction to Philosophy: Metaphysics (4)

An introduction to metaphysical thought, especially as it relates to topics such as freedom, mind, and God. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

**15. Introduction to Philosophy: Theory of Knowledge (4)**

A study of the scope and nature of human knowledge in both its everyday and scientific forms. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

**21. Introduction to the History of Science (4)**

This course examines the dramatic development of mankind's conception of the universe from the early Greek scientists through the modern period to Einstein. Emphasis will be on advances in cosmology, astronomy, dynamics, matter theory, mathematics, and biology.

**22. Introduction to the Philosophy of Science (4)**

An examination of recent theories about the nature of science and the character of scientific knowledge. Topics include the nature of confirmation, explanation, science vs. pseudo-science, instrumentalism vs. realism, and the ultimate aims of science. *Prerequisite: Phil. 21 or a year of prior study in one of the science programs.*

**23-24-25. Individual and Society (4-4-4)**

A course dealing with the historical and systematic development of social and political thought and institutions. Analysis and critical examination of representative texts drawn from classical and contemporary sources. (Philosophy 23-24-25 may be used in fulfilling the Revelle College second year additional humanities requirement. Philosophy 23-24-25 also may be used to fulfill the Muir College breadth requirement and the Third College humanities sequence.)

**27. Ethics and Society (4)**

(Same as Political Science 27.) An inquiry into the principles of ethical conduct and their application. The course examines some of the major theories (including natural law, individual rights, utilitarianism) and the general issue of rights and obligations with respect to adherence to law (as in civil disobedience, abortion, and the refusal to obey an unjust law or order). Case studies will be employed to consider the relevance of these principles to various occupations such as business, engineering, law, and government, in order to enable students to anticipate some of the difficulties that will arise for them in real life situations whenever hard choices must be made. Satisfies the Warren College ethics and society requirement. This course is required for all Warren students entering the college in fall 1985 and thereafter.

**31. History of Philosophy: Ancient Philosophy (4)**

An introduction to the study of classical Greek philosophy. The main emphasis of the course will be on the thought of Socrates, Plato, and Aristotle, but some consideration may also be given to pre-Socratic and Hellenistic philosophers. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

**32. History of Philosophy: The Origins of Modern Philosophy (4)**

An introduction to the study of early modern philosophy. Among the central concerns of the course will be the contrast between medieval and modern thought and the connection between the development of modern philosophy and the scientific revolution of the sixteenth and seventeenth centuries. Philosophers studied will include Descartes, Hobbes, Spinoza, and Leibniz, and possibly some medieval thinkers. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

**33. History of Philosophy: Philosophy in the Age of Enlightenment (4)**

An introduction to the study of the major philosophers of the late seventeenth and the eighteenth centuries. The course will focus largely on the British empiricists: Locke, Berkeley, Hume, and the "Critical Philosophy" of Kant. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

**103. Medieval Philosophy (4)**

An examination of the major trends of medieval philosophy through the study of selected texts by such authors as St. Augustine, Aquinas, Scotus, and Ockham. *Prerequisite: department stamp required.* May be repeated for credit with change of content.

**104. The Rationalists (4)**

A study of some of the major writings of one or more of the seventeenth-century rationalists: Descartes, Spinoza, Leibniz. *Prerequisite: department stamp required.* May be repeated for credit with change of content.

**105. The Empiricists (4)**

A study of the major writings of one or more of the British empiricists: Locke, Berkeley, Hume, Reid. *Prerequisite: department stamp required.* May be repeated for credit with change of content.

**106. Kant (4)**

A study of selected portions of the *Critique of Pure Reason* and of other writings of Kant. *Prerequisite: department stamp required.*

**107. Hegel and His Critics (4)**

A study of some of the essential features of the philosophy of Hegel and of the reaction to this philosophy on the part of thinkers such as Feuerbach, Marx, and Kierkegaard. *Prerequisite: department stamp required.* May be repeated for credit with change of content.

**108. Mythology and Philosophy (4)**

Study of various ancient Near Eastern mythologies in relation to early Greek philosophy.

**110. Symbolic Logic I (4)**

An introduction to the techniques of the predicate calculus, including relations and identity. Emphasis will be on acquiring skills in translating natural language into symbolic notation, in the various techniques of semantic evaluation, and especially in the use of natural deduction techniques. *Prerequisite: Phil. 10 or consent of instructor.*

**111. Symbolic Logic II (4)**

Introduction to axiomatic presentations of both the propositional and predicate calculi, and to their standard metatheory, which is the study of the important semantic and syntactic properties of these systems, such as expressive power, completeness, consistency, etc. *Prerequisite: Phil. 110.*

**112. Advanced Logic (4)**

An examination of topics in modal logic, free logic, relevance logic, or other non-standard interpretations and logical systems, plus appropriate metatheory. Course content will vary somewhat from year to year. *Prerequisite: Phil. 110.*

**113. Philosophy of Mathematics and Logic (4)**

The character of logical and mathematical truth; the relations between logic and mathematics; the significance of Godel's incompleteness result; Platonism, logicism, intuitionism, and more recent approaches. Course content may vary somewhat from year to year. *Prerequisite: Phil. 110 or consent of instructor.*

**120. Political Philosophy (4)**

An examination of fundamental issues regarding the nature of the state, society, and government, usually by way of a comparison of the tenets of classical liberal theory and Marxism.

**121. The State and Freedom (4)**

An advanced course in political philosophy focusing on such topics as contemporary treatments of social justice and of human freedom from liberal, conservative, and radical perspectives.

**122. Bio-Medical Ethics (4)**

The course will examine moral issues arising in the medical and biological sciences. Possible topics include: concept of health, patients' rights and professional responsibilities, behavior control, experimentation, genetic intervention, allocation of medical resources, and ethical issues concerning death, such as euthanasia, abortion, the rights of dying patients. *Prerequisite: upper-division standing or consent of instructor.*

**123. Ethical Theories (4)**

An examination of issues in ethical philosophy, with emphasis on the work of major historical figures in this area.

**124. Contemporary Moral Issues (4)**

An examination of contemporary issues in ethics, such as abortion, the treatment of animals, euthanasia, suicide, war. May be repeated for credit with change of content. *Prerequisite: department stamp required.*

**126. Sex Differences: Origins and Implications (4)**

(Same as Anthropology 123.) This interdisciplinary course focuses on the origins of sex differences and their political, social, and moral implications. Issues include: evolutionary, biological, cross-cultural, and sociological evidence for sex differences; legal, economic, social, and psychological effects of present differential treatment of the sexes; moral issues concerning the justification of present practices, preferential treatment, sexual role stereotypes, and family organization. *Prerequisite: upper-division standing or consent of instructor.*

**127. Professional Ethics (4)**

An inquiry into the fundamental norms or principles of conduct in the various professions. The course will examine the theoretical foundations of such norms in relation to the most important ethical theories (utilitarianism, contract theories, rights theories, etc.); will explore the relation between professional and ordinary norms and conduct; and it will discuss particular problem cases for various professions (legal, medical, business, engineering, etc.) in order to identify and examine those ethical features that may be unique to some professions.

**128. Seminar: Topics in Modern Political Thought (4)**

(Same as History 192 and Political Science 110K.) This course will examine the literature of specific individuals and topics including Burke on revolution; Saint-Simon and Fourier on utopian systems; Marx on class; and Sorel on creative myth. *Prerequisite: upper-division standing or consent of instructor.*

**130. Philosophy of Language (4)**

Philosophical reflections on such linguistic universals as meaning, synonymy, analyticity, reference, grammar, and speech acts. A selection of contemporary articles will be discussed. Some background in linguistics or philosophy is desirable.

**131. Topics in the Philosophy of Language (4)**

A careful examination of a selection of topics in the philosophy of language. A typical assortment development of intensional and extensional fragments of English, the role and structure of propositions, conversation and linguistic contexts, formal and informal semantics.

**135. Contemporary Analytic Philosophy: Russell and the Vienna Circle (4)**

A course in the history of analytic philosophy dealing with the writings of Frege, Russell, Wittgenstein (*Tractatus*), Quine, Tarski, Carnap.

**136. Contemporary Analytic Philosophy: Moore and Wittgenstein (4)**

A course in the history of analytic philosophy dealing with Moore, the later Wittgenstein, Wisdom, and Austin.

**140. Phenomenology and Existentialism: From Nietzsche to Heidegger (4)**

A study of the thought of Nietzsche, Husserl, and Heidegger with emphasis on the development of the phenomenological movement.

**141. Phenomenology and Existentialism: Sartre and His Critics (4)**

A study of existential phenomenology, through the works of its major representatives such as Sartre, Merleau-Ponty and others, as well as other recent philosophical movements on the European continent.

**145. Nihilism (4)**

(Same as Humanities 145.) A consideration of various claims about the end or collapse of the Western philosophical tradition, with particular emphasis on claims about the consequences of the absence of "ultimate" rational justification in morality, or even in science and philosophy. Readings will vary, but will most likely include works by Nietzsche, Dewey, Heidegger, Wittgenstein, Derrida; seminal texts in the history of moral and political thought, and selections from contem-

**Upper Division**

**101. Plato (4)**

A study of some of the major dialogues of Plato. *Prerequisite: department stamp required.* May be repeated for credit with change of content.

**102. Aristotle (4)**

A study of some of the major works of Aristotle. *Prerequisite: department stamp required.* May be repeated for credit with change of content.

## PHILOSOPHY

porary American philosophers concerned with the issue. *Prerequisite: upper-division standing or consent of instructor.*

### 150. Aesthetics (4)

(Same as Humanities 150.) An examination of major concepts and issues in aesthetics, such as truth, expression and imagination, the nature of the aesthetic attitude and of critical evaluation. *Prerequisite: upper-division standing or consent of instructor.*

### 152. Philosophy and Literature (4)

(Same as Humanities 152.) A study of philosophical themes as presented in selected fiction, drama, or poetry, as well as an inquiry into philosophical puzzles that arise in the appreciation and criticism of literature. *Prerequisite: upper-division standing or consent of instructor.*

### 153. Film Aesthetics (4)

A consideration of some special problems in aesthetics relevant to film as an art form. Topics may include: the problem of a film's authorship; whether there are unique assumptions in film criticism and the relation between those assumptions and others relevant to literature, drama, and visual art; unity, theme, narration, and structure in film; "high art" — "low art" distinctions; films as representational.

### 160. Philosophy of Religion (4)

This course provides a general introduction to the philosophy of religion through the study of classical and contemporary texts. Among the issues to be discussed are the existence and nature of God, the problem of evil, the existence of miracles, the relation between reason and revelation, and the nature of religious language.

### 161. Religious Existentialism (4)

This course will deal with the existential approach to the religious life and with conceptions such as faith, freedom, and guilt. Authors studied in a particular term may vary and will include Pascal, Kierkegaard, Dostoevski, Buber, and Tillich.

### 162. Philosophy of Law (4)

An introduction to selected topics and problems such as the nature of law and legal systems, the relationship of law to morality, theories of punishment and legal responsibility, issues of civil disobedience, privacy, paternalism, and affirmative action.

### 164. Philosophy of History (4)

(Same as Humanities 164.) A study of classical and contemporary conceptions of history and historical knowledge. *Prerequisite: upper-division standing or consent of instructor.*

### 170. Metaphysics (4)

The content of this course will vary from year to year, but in each case it will center around fundamental problems in metaphysics, such as the mind-body problem, problem of universals or the other-minds problem. The discussion of these issues may be either historical or analytic or both, depending upon the interests of the instructor.

### 172. Knowledge and the External World (4)

An examination of some of the fundamental issues about the nature of knowledge gained through sensory experience, such as scepticism, the structure of knowledge, justification of knowledge claims, the nature of perception, sense-data theory, the problem of other minds.

### 173. Knowledge and Necessity (4)

A course in theory of knowledge dealing with topics such as: the nature of our knowledge of the necessary truths of mathematics and logic, the estimation of the probability of untested hypotheses, the validity of the distinction between *a priori* and *a posteriori* knowledge (and related distinctions).

### 174. Philosophical Psychology (4)

An examination of issues in the philosophy of mind and philosophy of action, such as the nature of beliefs, emotions and actions and the interrelationships between them; the nature of the mental and conceptual issues arising in psychology.

### 180. Advanced Philosophy of Science (4)

A detailed examination of some of the central problems in contemporary philosophy of science. Typical topics include current theories on the nature of explanation, the nature of scientific revolutions, inductive logic and rational methodology, and scientific realism vs. various anti-realisms. *Prerequisites: Phil. 110, and either Phil. 22 or consent of the instructor.*

### 181. Philosophy of Physics (4)

An introduction to some of the most prominent philosophical

problems arising from the development of modern physics. Typical topics may include the philosophy of space and time, the epistemology of geometry, the philosophical significance of Einstein's theory of relativity, the significance of quantum mechanics, and modern cosmology. *Prerequisite: consent of instructor.*

### 182. Philosophy of Biology (4)

An examination of the philosophical problems generated by the biological sciences. Topics include: the relation of biology to the physical sciences, the status and structure of evolutionary theory, the role of biology in social science, and others. *Prerequisite: consent of instructor.*

### 183. Philosophy of Psychology/Neuroscience (4)

This course examines the philosophical issues surrounding the scientific study of cognition, perception, and other mental phenomena. Topics include: reductionism, functionalism, methodological and substantive issues in cognitive psychology, artificial intelligence, and the neurosciences. *Prerequisite: consent of instructor.*

### 184. Philosophy of the Social Sciences (4)

An examination of problems arising out of the concepts, methods, and goals characteristic of the social sciences. Topics include: causal vs. rational explanations of behavior; the individual vs. the social whole as the unit of study; the role of values; and the meaning and possibility of objectivity and freedom as a presupposition or consequence of social theory.

### 185. Special Topics (4)

A course devoted to a specific philosophical problem. May be repeated for credit with change of content.

### 186. Technology and Human Values (4)

(Same as STPA 107.) Traditional ideas of nature and the rise of modern science and technology. The influence of the rise of science and technology on political ideals, on human life, on freedom, education, and warfare.

### 187. Philosophical Aspects of Cognitive Science (4)

This course offers an introduction to some of the basic concepts in cognitive science, and considers some of the current debates about the nature and implications of cognitive theories. Topics may include: mental representation, consciousness, rationality, nativism.

### 195. Introduction to Teaching in Philosophy (4)

Introduction to teaching philosophy. Under the supervision of the instructor, each student will run a class section in one of the philosophy department's courses. Attendance at lectures in the course and additional consultation with the instructor are required. *Prerequisites: upper-division standing and consent of instructor and department chairman.*

### 196A. Philosophy Honors (4)

A program of independent study providing candidates for philosophy honors an opportunity to develop, in consultation with an adviser, a preliminary proposal for the honors essay. An IP grade will be awarded at the end of this quarter. A final grade will be given for both quarters at the end of 196B. *Department stamp required.*

### 196B. The Honors Essay (4)

Independent study under the supervision of a faculty member leading to the preparation of an honors essay. A letter grade for both 196A and 196B will be given at the completion of this quarter. *Department stamp required.*

### 198. Directed Group Study (4)

Directed group study on a topic or in a field not included in the regular departmental curriculum by special arrangement with a faculty member. (P/NP grades only.)

### 199. Individual Study (4)

*Prerequisite: consent of departmental adviser. (P/NP grades only.)*

## Graduate

### 201. Greek Philosophy (4)

A study of selected authors and texts from the history of ancient Greek philosophy. May be repeated for credit with change of content.

### 202. Hellenistic and Roman Philosophy (4)

Selected topics drawn from the major philosophical schools in the Hellenistic and Roman periods, among them Stoicism, Epicureanism, Skepticism, and Neo-Platonism.

### 203. Medieval Philosophy (4)

A study of representative writings from one or more of the major philosophical movements of the Middle Ages.

### 204. Early Modern Philosophy (4)

A study of selected philosophers of the sixteenth and seventeenth centuries as, for example, Descartes, Spinoza, Leibniz, and Locke. May be repeated for credit with change of content.

### 205. Eighteenth-Century Philosophy (4)

A study of major philosophical texts of the period such as Kant's *Critique of Pure Reason* and Hume's *Treatise of Human Nature*. May be repeated for credit with change of content.

### 206. Nineteenth-Century Philosophy (4)

A selective study of major philosophical texts for the period with emphasis on such figures as Hegel, Marx, Nietzsche, Mill, and others. May be repeated for credit with change of content.

### 207. Contemporary European Philosophy (4)

A study of selected topics in twentieth-century European philosophy as reflected in the major writings of Husserl, Heidegger, Sartre, Merleau-Ponty, and others.

### 208. Contemporary Analytical Philosophy (4)

A study of the historical development of the analytical movement with emphasis on major texts. May be repeated for credit with change of content.

### 210. Philosophy of Logic (4)

A study of major topics in logical theory: the status of logical truth, the epistemology and metaphysics of logic, the significance of recent results in mathematical and logical theory, the significance of alternative systems of logic. *Prerequisite: Phil. 110 or equivalent.*

### 211. Advanced Symbolic Logic (4)

Topics in mathematical logic and set theory, metatheory, non-standard logics, and other contemporary developments in logical theory. *Prerequisite: Phil. 111 or equivalent.*

### 212. Contemporary Topics in the Philosophy of Science (4)

This seminar will cover current books and theoretical issues in the philosophy of science. Topics will vary from year to year. *Prerequisite: Phil. 180, or equivalent, or consent of instructor.*

### 215. Introduction to Formal Semantics (4)

A general introduction to theories of sense and reference, comprising a comparative approach to Fregean, Russellian, and Tarskian semantic techniques, with emphasis on semantic primitives and the general structure of theories of truth.

### 223. Ethics (4)

An examination of the nature of moral problems, judgments, and principles, with emphasis on recent developments in moral philosophy and classic formulations of ethical theories.

### 224. Social and Political Philosophy (4)

An analysis of social philosophies and ideologies in their relationship to basic types of social structure. May be repeated for credit with change of content.

### 235. Philosophy of Language (4)

(Same as Linguistics 286.) Examination of some current philosophical and scientific views on the nature, use, and acquisition of natural languages. May be repeated for credit as course content may vary.

### 250. Aesthetics (4)

An exploration of problems in philosophy of art, aesthetic experience, and aesthetic judgment within the context of a critical survey of some current aesthetic theories and their illustrative application in various fields of art.

### 260. Philosophy of Religion (4)

A study of the philosophical foundations of religious experience, including the nature of belief and knowledge, faith and reason, God, and the character and meaning of religious commitment.

### 262. History of Law in Philosophical Perspective (4)

Course will study the way in which the historical development of the Western legal system reflects issues raised in the literature of legal philosophy. Students will read works of le-



gal philosophy in conjunction with studies of the history of legal doctrines and institutions.

**264. Philosophy of History (4)**

An examination of basic concepts, categories, and representative philosophies of history.

**270. Contemporary Epistemology and Metaphysics (4)**

A detailed examination of some fundamental issues in contemporary philosophy, especially those centering about the theories of meaning and reference.

**272. Theory of Knowledge (4)**

An examination and critique of representative theories of mind, reality, knowledge, and perception.

**274. Philosophy of Mind (4)**

Contemporary work on the relation of mind and body, subjectivity, and the problem of other minds. May be repeated for credit with change of content.

**285. Seminar on Special Topics (4)**

A seminar for examination of specific philosophical problems. (S/U grades permitted.)

**290. Direct Independent Study (4)**

Supervised study of individually selected philosophical topics. May be repeated for credit. *Prerequisite: consent of instructor.* (S/U grades permitted.)

**295. Research Topics (1-12)**

Advanced, individual research studies under the direction of a member of the staff. May be repeated for credit. *Prerequisite: consent of graduate adviser.* (S/U grades permitted.)

**299. Thesis Research (1-12)**

(S/U grades permitted.)

**500. Apprentice Teaching (1-4)**

A course designed to satisfy the requirement that graduate students should serve either as teaching assistants in the Department of Philosophy, or in the Humanities Program in Revelle College, or in the writing programs offered by the various colleges. Each Ph.D. candidate must teach the equivalent of quarter-time for three academic quarters. (S/U grades only.)

**PHYSICAL EDUCATION**

OFFICE: Gymnasium, Revelle College

**Supervisors:**

- John W. Cates, M.A.
- Diana E. Chadwell, M.S. (*Director of Recreation*)
- J. Barry Cunningham, Ed.D.
- John H. Douglass, Ph.D. (*Coordinator of Minor Program*)
- Howard F. Hunt, Ph.D. (*Interim Chairman*)
- J. Charles Millenbah (*Vice Chairman*)
- Bert N. Kobayashi, Ph.D.
- Robert C. Moss, M.S.
- Andrew Skief, Jr., M.S.
- Judith M. Sweet, M.S., M.B.A. (*Athletic Director*)
- Frank N. Vitale, M.S. (*Director of Instructional Programs*)
- James R. White, Ph.D.

**Associate Supervisor:**

- Margaret C. Marshall, M.F.A. (*Co-coordinator of Dance Program*)

**Assistant Supervisors:**

- Ann K. Jones, Ph.D.
- Patricia A. Rincon, M.F.A. (*Co-coordinator of Dance Program*)

**Teachers/Special Programs:**

- Lynne Antonelli, B.F.A.
- Derek Armstrong
- Catherine Colby, M.A.
- Douglas H. Dannevik, A.A.
- Daniel Grobeck, B.S.
- Dennis Harper, B.S.
- Jean M. Isaacs, M.B.A.
- Elizabeth K. LaPlante, B.A.
- Edward A. Machado, B.A.
- Keith Miller, B.A.
- Robert P. Mulligan, Ph.D.
- Valerie O'Hara, M.A.
- Alice Rincon, M.F.A.
- Judith Sharp, B.S.
- Linda S. Sundstrom, M.A.
- Steve E. Ubl
- W. M. Vander Griend, Ed.D.
- Colleen R. Wight, M.A.
- Michael J. Wydra, B.A.
- Tadashi Yamaguchi

**Instructional Program**

The instructional program in the Department of Physical Education at UCSD consists of two major divisions: 1) A general instructional program in a variety of fitness, sport, and dance activities, and 2) An academic minor program in physical fitness and health management.

**Physical Fitness and Health Management Minor Program**

The Department of Physical Education offers a noncontiguous minor in physical fitness and health management designed to provide students with an understanding of the interrelated areas of physical fitness and health management. The lower-division courses are intended to give the students preparation in biology, chemistry, and social sciences, upon which the upper-division courses are built. Some of the lower-division requirements will normally be a duplication of the student's major requirements and, therefore, may not have to be repeated.

The minor is structured to study the human body from different perspectives. For example, in P.E. 84, Anatomy/Kinesiology, the structure of bones, muscles, and nerves are studied in relation to a variety of human movement situations. In P.E. 160, Exercise Physiology, the human body is studied from a physiological perspective, which focuses on human potentials and limitations during exercise. In P.E. 170, Psychological Basis of Sport and

Physical Activity, psychological explanations of human behavior, pre-, post-, and during exercise are studied. Anatomical, physiological, and psychological explanations are only partially useful, however, because they focus exclusively on the individual. The sociological perspective used in P.E. 120, Sports in America, and 121, The Black Athlete, in contrast, stresses those factors external to the individual. These five courses provide the students with an integrated understanding of the human experience in regard to exercise and physical education.

**Lower Division**

Physical Education 81 — Introduction to P.E.

Physical Education 84 — Anatomy/Kinesiology

**Lab**

Biology 13 — Nutrition (Prerequisite — Biol. 10)

**Upper Division**

Physical Education 120 — Sports in America (Prerequisite — Soc. 1 or equivalent)

Physical Education 121 — The Black Athlete (Prerequisite — Soc. 1 or equivalent)

Physical Education 160 — Exercise Physiology (Prerequisite — Biol. 14, Chem. 5A, Chem. 5B)

Physical Education 160L — Exercise Physiology Lab (Prerequisite — Biol. 14, Chem. 5A, Chem. 5B)

Physical Education 170 — Psychological Basis of Physical Activity (Prerequisite — Psych. 1, 2, 3, or 4)

**Physical Education Minor for Revelle Noncontiguous Minor**

To satisfy requirements for a noncontiguous P.E. minor, a Revelle student must meet all requirements specified by the P.E. department (see above). In addition to this, at least two of the lower-division courses must be noncontiguous to the major and these two courses may not be used on any other general-education requirement.

**General Instructional Program**

The Department of Physical Education's General Instructional Program provides enthusiastic, contemporary, and comprehensive instruction in a wide variety of fitness, sport, and dance activities designed to meet the needs and interests of all students. In addition to offering classes at beginning, intermediate, and



## PHYSICAL EDUCATION

advanced skill and fitness levels, the department also provides instruction for students who may be either temporarily or permanently disabled.

Based on student interest and in keeping with national trends, a major emphasis of the General Instructional Program in recent years has been on counseling and instruction designed to promote physical fitness and a healthy, active lifestyle. Physical Education faculty members are available to all students for advice and suggestions on both personal programs and courses that will improve the level of students' health and fitness, as well as encourage and establish attitudes and habits of lifetime fitness.

To this end, the General Instructional Program offers a multitude of fitness-related courses, including: Swim Conditioning, Weight Training, Coed Conditioning (running, calisthenics, weight training, and stretching), Exercise, Nutrition, and Weight Control, Yoga, Triple Fitness Conditioning, Interval Running, and Long Distance Running. Each course is designed to accommodate each student individually while providing a sound, informative basis on which to build a personal fitness program, including a personal fitness evaluation and instruction in appropriate and safe exercise principles.

Another major component of the General Instructional Program is the Dance Program. In addition to offering interested students an introduction to the aesthetic of dance, the program also provides a means for improving such areas of physical fitness as cardiovascular and muscular endurance, flexibility, balance, and coordination. Course offerings include a broad span of activity classes in ballet, jazz, and modern dance, along with courses in Choreography, Musical Theater, Dances of a Selected Culture, Ballroom, and Folk Dance.

Performance opportunities are offered to interested students through student and dance concerts. The campus also draws a wide variety of professional dance companies for performances.

Other major components of the General Instructional Program are the areas of Individual and Team Sports, Aquatics, Certificate Courses, and the Applied Rehabilitation/Disabled Student program. Specific courses offered in these areas are listed below:

- Certificate Courses — Lifesaving, Water Safety Instruction, and First Aid

- Individual Sports — Tennis, Badminton, Golf, Squash, Handball, Gymnastics, Karate, and Fencing
- Team Sports — Volleyball, Basketball, Softball, Soccer
- Aquatics — Swimming, Skin Diving, Scuba Diving, Diving and Surfing
- Rehabilitation — Applied Rehabilitation
- Disabled Students — Activities for the Disabled Student

For further information, call 534-0334.

## Participating in Activities

### Intramural Sports

Intramural sports provide a diversity of sports in which all students may participate each quarter. Intramurals are the most popular activity on campus and are perhaps the best method for meeting new friends. Leagues are arranged by the competitive desires of the participants and thus range from the highly skilled to those merely out for exercise and fun with little or no regard for winning. The emphasis is toward coed sports (men and women on the same team) as the department believes the social and physical aspects are equally important. Activities include men's and coed competition in flag football, innertube waterpolo, floor hockey, volleyball, basketball, soccer, softball, and tennis. Come and join the fun.

### Recreational Clubs

The recreational clubs play a varied and active role in the students' life on campus. At present there are over thirty clubs open for participation. These include: aikido, archery, ballroom dance, belly dance, conditioning, frisbee, gymnastics, handball/raquetball, disco, Israeli dance, jazz dance, judo, karate, outing, SCUBA, snow skiing, table tennis, and yoga (hatha).

### Special Events

The campus special events program provides a quarterly schedule of major and recreation-oriented special events that are designed to attract students from all segments of the campus. Major campus-wide activities include dances, carnivals, festivals, casino nights, etc., while recreation-oriented events include bike races, cross-country runs, over-the-line tournaments, superstars all-sports competition, etc.

## Outdoor Recreation

Special Events are scheduled off-campus including backpacking, cross-country skiing, rock climbing, kayaking, and mountaineering. Workshops, seminars, and discussions on wilderness cookery, first aid, and orienteering are given. These are unique experiences in noncompetitive activities for students.

An equipment rental program is available to participants for short-term use.

### Aquatic Sports

The Mission Bay Aquatic Center on Santa Clara Point, Mission Bay, is only seven miles from campus. Classes are offered in waterskiing, sweep rowing, surfing, SCUBA diving, and sailing (Hobie cats, sloops, and cat rigged). Recreational sailing, waterskiing, and rowing are also available.

### Ocean Sailing Program

The UCSD ocean sailing program provides students the opportunity to learn all aspects of practical sailing as well as sailboat theory. Classes are offered in ocean cruising, celestial navigation, coastal navigation, and ocean racing as well as various other practical and theoretical sail related courses. Through the ocean sailing program, UCSD provides all interested students the latest in nautical education, and establishes itself on the frontier of sailboat technical innovation. For more information contact Don Raidt at 534-4037.

### Casual Recreation

Many hours are available to use gymnasium and pool facilities. Noontime and evening volleyball, badminton, or basketball games are popular. The sailing facility on Mission Bay at Santa Clara Point is also popular.

### Intercollegiate Athletics

Students possessing a high degree of proficiency and interest in sport skills may compete against other Southern California colleges and universities in regularly scheduled men's and women's, and coed athletic events. Presently twenty-eight UCSD teams represent the campus. Participation is entirely voluntary; students are encouraged to compete for the challenge of competition and the pleasure of participation. For further information, contact the intercollegiate office at 534-4211.

## Courses

Registration for physical education classes take place along with regular aca-

demic enrollment, except intercollegiate teams, for which students must check with the intercollegiate office. Consult the *Schedule of Classes* issued by the Office of the Registrar for specific course offerings. Not all courses are offered each quarter. Courses are offered at various skill levels with specific skill levels identified as follows:

- A. Introductory level (intended for those with little or no previous experience in the activity).
- B. Advanced beginning level (continued instruction and practice on basic skills).
- C.&D. Intermediate level (improvement of skill techniques and/or game strategy.)
- E. Advanced level (for skilled participants with instruction to perfect techniques and sharpen competitive strategy).
- G. Courses specially designed for the physically handicapped student.

**1A-B. Swimming (.5)**

Designed to permit students to gain or improve swimming strokes, techniques, and aquatic skills on an individual basis.

**1C. Swimming, Intermediate (.5)**

This course is designed to permit students to gain or improve swimming strokes, techniques, and aquatic skills on an individual basis. *Prerequisite: beginning swimming skills required.*

**1D. Swim Conditioning (.5)**

Swimming for intermediate level swimmers who wish to utilize swimming as a physical conditioning class.

**2. Synchronized Swimming (.5)**

Designed for advanced swimmers. Fundamentals in individual and group water ballet. Opportunity for public presentations. May not be offered all quarters.

**3. Lifesaving (.5)**

The American Red Cross Senior Lifesaving Certificate will be awarded to students satisfactorily completing the course. Emphasis is placed upon knowledge and skills to prepare one to save his or her own life, or the life of another in an emergency. *Prerequisite: intermediate swimming or consent of instructor.*

**4. Water-Safety Instruction (.5)**

Standard American Red Cross course designed to train authorized water-safety instructor to teach A.R.C. swimming and lifesaving courses thereafter. *Prerequisite: only holders of the A.R.C. Senior Lifesaving Certificate are eligible to register. Students must pass Part I in order to qualify for Part II.*

**6D. Advanced Open Water SCUBA Diver (.5)**

This course is designed to introduce the beginning, newly certified, inexperienced SCUBA diver to the local marine environment in a safe and enjoyable manner. It will expose the diver to the basic elements of SCUBA and the oceanic environment so that confidence and enhancement of enjoyment can be gained. *Prerequisites: recognized basic SCUBA certification, with medical approval. Student must furnish all gear.*

**6E. Boating SCUBA Diver (.5)**

This course envelopes the operation, care, and maintenance of a small boat, "rules of the road" in boating, knot tying and the uses of knots, and boating etiquette, as well as the SCUBA diving activities and methods while operating from a small boat. *Prerequisites: P.E. 6D/Adv. Open Water SCUBA Diver, or consent of the instructor. Student must furnish all SCUBA gear.*

**6F. Sea Resources SCUBA Diver (.5)**

This course exposes the SCUBA diver to the vast richness of

the sea. Through the methodology of SCUBA, the student will become knowledgeable about the nearshore oceanic resources in local water and their uses by industry and the food services. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver. Student must furnish all SCUBA gear.*

**6H. Deep SCUBA Diver (.5)**

This course introduces the techniques and knowledge needed for the safe conduct of deep SCUBA divers. Decompression calculations, nitrogen narcosis, mandatory equipment, and sequential depth experiences are emphasized, with implementation on a weekly progression. Progressively deeper dives are accomplished by adherence to a safe sequence. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver. Student must furnish own gear, to include submersible watch and depth gauge.*

**6I. Research SCUBA Diver (.5)**

This course exposes SCUBA divers to methodology, techniques, gear, and sampling protocol followed by research programs in conducting underwater SCUBA operations. The setting up of a project, determination of sampling methods, recording of observations documentation and presentation of results are discussed and thoroughly analyzed. Familiarity with gear used in marine biology, submarine geology, and physical oceanography required. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver, or consent of the instructor. Student must furnish all SCUBA gear.*

**6J. Search and Recovery/Night SCUBA Diver (.5)**

This course exposes the experienced SCUBA diver to working under limited visibility conditions. Methods in the conduct of search operations underwater, the recovery of items located, and multiple-person team operations will be discussed and implemented. The conditions of limited visibility, especially in zero-visibility waters and in night dive operations, will be experienced. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver. Student must furnish all gear, including underwater flashlight and compass.*

**7A. Skin-Diving (.5)**

Techniques of skin-diving with practical experience in the ocean environment. Introductory course will include lectures on equipment, ocean environment, and principles of skin-diving. Pool training will precede ocean experience. *Prerequisite: physically fit.*

**8E. Divemaster SCUBA Diver (.5)**

This course trains the advanced and experienced SCUBA diver in the initiation, implementation, coordination, and logistics for a group and/or class SCUBA diver. Organization both on land and in the water will be stressed, as will the responsibilities of a divemaster. Development of leadership assertiveness and assumption of responsibility will be focused on throughout the course. *Prerequisites: P.E. 6D/Adv. Open Water SCUBA Diver plus P.E. 6E, 6F, 6H, and 6J, or consent of the instructor. Student must furnish all gear, including a safe second.*

**8F. Assistant SCUBA Instructor Tutoring (.5)**

This course develops the teaching and organization skills of the Divemaster SCUBA Diver in both classroom and water sessions. Oral presentations, practical water skills teaching, and structuring lesson units will be emphasized. The elements of methods of instruction will be discussed and applied; teaching will be structured to reach a wide scope of target audiences. *Prerequisites: P.E. 8E/Divemaster SCUBA Diver, or consent of instructor. Student must furnish all SCUBA gear.*

**10A-B-C. Surfing (Beginning, Adv. Beg., Intermediate) (.5)**

Surfing techniques taught in pool — including mounting, sitting, paddling and turning surfboard, safety techniques. After mastery of pool techniques, students surf in ocean. *Prerequisite: ability to swim 400 yards, basic lifesaving skills, and UCSD beginning swimmer's certificate.*

**14A. Tennis, Beginning (.5)**

Basic instruction in the serve, forehand drive, backhand drive, terminology, rules, scoring, and playing strategy for the 3-stroke game. *Prerequisite: none.*

**14B. Tennis, Advanced Beginning (.5)**

Continued instruction in the serve, forehand and backhand drives; and introduction to the volley, lob, overhead smash, and basic singles and doubles strategy. *Prerequisite: 14A or consent of instructor.*

**14C. Tennis, Intermediate Strokes (.5)**

Review of the serve, forehand and backhand drives, and concentrated instruction in the volley, lob, overhead smash, return of serve, and half-volley. *Prerequisite: 14B or consent of instructor.*

**14D. Tennis, Intermediate Strategy (.5)**

Instruction and drills in court tactics and strategy for single and doubles play utilizing all strokes, with emphasis on application in competitive play. *Prerequisite: 14C or consent of instructor.*

**14E. Tennis, Advanced (.5)**

Advanced instruction and drills in all strokes, tactics and court strategy for competitive play. *Prerequisite 14D or consent of instructor.*

**14F. Tennis, Stroke Improvement (.5)**

Designed for students who have completed beginning and advanced beginning tennis but still have stroke deficiencies (i.e., weak or incorrect backhand drive or poor serve). The serve, backhand, and forehand drive are the three strokes to be improved or corrected.

**14G. Tennis, Wheelchair (.5)**

Physically handicapped students (those confined to wheelchairs) will be given basic instruction in the sport of tennis. Students will be taught the serve and modified forehand and backhand strokes, with particular attention given to racquet fall angles rather than physical form. Note: Students in all tennis classes are required to furnish a can of new tennis balls by the second class meeting.)

**15A-B-C-D-E. Badminton (.5)**

Instruction in the fundamentals of the serve, strokes, volley, rules, scoring, tactics, and court strategy. Designed to allow both men and women students, novice and expert, an opportunity to participate.

**16A-B-C-E. Volleyball (.5)**

An emphasis on fundamental skills in serving, spiking, blocking, and teamwork techniques. Opportunity for team competition.

**17A-C. Golf (.5)**

Instruction and practice in the fundamentals of golf. Emphasis is placed upon golf swing and techniques of using all clubs under varying conditions. Classes are offered in beginning and intermediate levels.

**18. Choreography (.5)**

Exploration of movement as a tool for communication. Examination of symmetrical, asymmetrical, oppositional, and successional shapes along with analysis of spacial designs and rhythmic patterns. Methods of composition using improvisation and props will be included. (All students enrolled will be required to choreograph a three- to ten-minute dance work. If the student desires, his or her work may be auditioned for inclusion in the Annual Faculty/Student Dance Concert held in the Mandeville Theatre at the end of the spring quarter.) *Prerequisites: Advanced beginning to intermediate advanced-level technique, consent of instructor.*

**19. Squash (.5)**

Introduction to the sport, including instruction in fundamental skills and techniques, individual and group practice, and opportunities for competition.

**20A-C. Handball (.5)**

Instruction in fundamentals of the serve, rally, and court strategy. Opportunity for singles and doubles competition. A = Beginning; C = Intermediate.

**21A. Modern Dance, Beginning (.5)**

Opportunities in dance, techniques. Pattern variations will be discovered in time, space, and design. Students will explore improvisation and composition. These, woven together with the technical skills, will produce a means of communication through a controlled body.

**21B. Modern Dance, Advanced Beginning (.5)**

Modern dance at the level beyond beginning, but not at the intermediate level. Requires some knowledge and ability. A continuation of 21A. *Prerequisite: Beginning Modern Dance or consent of instructor.*

## PHYSICAL EDUCATION

### 21C. Intermediate Modern Dance (.5)

The content of Intermediate Modern Dance class is based on the language of body movement. All types of movement are explored and re-explored, developing mind and body coordination and kinetic resources. Various modern and contemporary techniques are taught. *Prerequisites: Beginning Modern Dance and consent of instructor.*

### 22A. Jazz Dance, Beginning (.5)

Emphasis will be on technical skills of jazz dance including current dance trends, general rhythmic exercises, isolations, turns, locomotor combinations, and dance sequences to the accompaniment of contemporary rock and jazz music. Students will have the opportunity for simple improvisation and composition.

### 22B. Jazz Dance, Advanced Beginning (.5)

Emphasis will be on technical skills of jazz dance including current dance trends, general rhythmic exercises, isolations, turns, locomotor combinations, and dance sequences to the accompaniment of contemporary rock and jazz music. Students will have the opportunity for simple improvisation and composition. *Prerequisite: beginning jazz or consent of instructor.* (Note: Progressive levels within the techniques taught in jazz classes assist the student to advance from introductory to higher levels.)

### 22C. Jazz Dance, Intermediate (.5)

A dance technique class in which the student learns the contemporary and lyrical styles of jazz dance to rhythmical music, working in individual and group situations. Students learn techniques and body control, advancing toward performance. *Prerequisites: beginning jazz and/or consent of instructor.*

### 22E. Jazz Dance, Advanced (.5)

Advanced technique in jazz dance incorporating the styles of "blues" to "rock." Emphasis on flexibility, line and style, musicality, choreography, and composition. *Prerequisite: intermediate jazz or consent of instructor.*

### 23A. Ballet, Beginning (.5)

An introduction to classical ballet. An experience in a disciplined form of dance which is essential to dancers before attempting modern and contemporary dance styles. An opportunity for students to be trained in ballet with emphasis on technique, theory, music, projection, and terminology.

### 23B. Ballet Dance, Advanced Beginning (.5)

A continuation of 23A. For the ballet student who has achieved some skills and ability, but not yet at the intermediate level. *Prerequisite: 23A or consent of instructor.* (NOTE: Progressive levels within the techniques taught in ballet classes assist the student to advance from introductory to higher levels.)

### 23C. Ballet, Intermediate (.5)

A continuation of ballet with emphasis on technique, theory, music, projection, and terminology designed for students with more training. *Prerequisite: beginning and advanced beginning ballet and/or consent of instructor.*

### 23E. Ballet, Advanced (.5)

A continuation of ballet technique, theory, music, and terminology designed for the student with advanced training. May include pointe work, pas de deux, variations, and choreography. *Prerequisites: intermediate ballet and consent of instructor.*

### 24. Folk Dance, Beginning (.5)

This course is an introduction to folk dance, designed to help the beginning student learn basic steps, formations, and patterns in folk dance. Familiar round and square dances will be taught. Confidence and creativity in following rhythms and responding with movement will be stressed.

### 25A-B-C. Tap Dance (Beg., Adv. Beg., and Intermed.) (.5)

Emphasis on rhythm, coordination, timing and style. Introduction (beginning) course will teach basic time step, soft shoe, fast buck rhythms, and simple routines suitable for performance. Advanced-Beginning will include more intricate rhythms such as riffs, pull backs and wings. Intermediate course uses more complicated rhythms and requires more skills. All classes have exercises at the barre.

### 26A-B-C. Ballroom Dance (.5)

Course will include four to six basic variations of foxtrot, tango, waltz, samba, rhumba, and swing. Includes discussion and instruction by students about current trends in

dance, e.g., hustle, bus stop. Extracurricular events will be encouraged.

### 27A. Aerobic Conditioning, Beginning (.5)

A conditioning class using aerobics to improve cardiovascular performance, stamina, and overall fitness. Energetic exercise routines are done to music. Students are taught to monitor their own heart rates, and the significance of heart rate in terms of a fitness program is explained. General fitness concepts and approaches are also discussed. Blood pressure and skinfold (body fat) measurements will also be taken.

### 27C. Aerobic Conditioning, Intermediate (.5)

A more advanced conditioning class for those who know the basics and have participated in three consecutive 27A classes or have attained the same level of fitness. This course will place greater emphasis on improved muscular strength and flexibility, with an increase in duration intensity and progression. *Prerequisite: three consecutive quarters of 27A or comparable level of fitness.*

### 27D. Aerobic Dance/Energy for the Actor (.5)

Develop understanding and self-initiative in cardiovascular fitness, using jazz dance exercise as primary tool. Resting and exercise target heart-rates, blood pressure and food-as-fuel dieting will be explored, individually. Daily workout during times of heavy stress and deadlines will be discussed, as relations to lifetime benefits.

### 28. Elements of Mind/Body Movement (.5)

Designed to acquaint students with mechanical and mental relationships needed to produce coordinated movement. Includes mechanics of body coordination, mind dynamics, and training.

### 29A. Soccer, Beginning (.5)

Instruction in fundamentals. Skills, game strategy, and team play are scheduled. 29A = Beginning; 29B = Advanced Beginning.

### 29C. Soccer, Intermediate (.5)

Instruction in skills, game strategy, and team play for students who have previous soccer experience.

### 30. Softball Skills (.5)

Course instruction will include demonstrations, drills, and supervised play. Special emphasis will be focused on fielding/batting practice, other lead-up softball/baseball exercises, and team strategies. Course activities are designed to encourage maximum participation by all, regardless of their skills level.

### 32A-C. Interval Running for Condition (.5)

Designed to meet specific conditioning needs of each student through several different types of running such as hollow springs, interval sprints, slow and fast intervals, continuous fast running, and continuous slow running. The conditioning program will be individualized and determined by performance runs. A = Entry Level; C = Intermediate Level.

### 33A-C. Conditioning, Coed (.5)

Designed to meet individual needs of each student enrolled in class, through personal evaluation of diet, measurements, and exercise program. Students who have already taken a class in physical conditioning, weight training, or who can run one or two miles, qualify for the intermediate course. Intermediate conditioning includes cardiovascular efficiency, weight training, isometrics, circuit training, crosscountry runs, etc. (NOTE: Occasionally, classes for combined levels are offered.)

### 34A-C. Weight Training (.5)

Principles and programs of weight training and related areas of fitness including circuit training, individual weight training routines, aerobic training, posture correction exercises, and diet and nutrition for health, exercise, and weight control.

### 35. Exercise, Nutrition, and Weight Control (.5)

Theory and practice of regular exercise and nutritional needs for development, maintenance, and continuation of good health and weight control.

### 36. Advanced Conditioning-Long Distance and Marathon Running (.5)

In addition to marathon training, class lectures include individualized fitness evaluation and training schedules, injury prevention, equipment, nutrition programs, blood and obesity in health factors, and psychological preparation for long distance running. *Prerequisite: ability to run a minimum of five miles.*

### 38A-B-C-E. Basketball (.5)

Instruction in fundamentals are combined with opportunities for team play. Some previous knowledge of the game is desirable since emphasis will be on vigorous competition. A = Beginning; B = Adv. Beginning; C = Intermediate; E = Advanced.

### 40A. Gymnastics/Coed/Beginning (.5)

An introduction to the beginning student. Apparatus adjustment, safety procedures and spotting techniques are taught. Emphasis on improving all components of physical fitness with attention to upper body strength. Tumbling and progressive skills are learned.

### 40C. Gymnastics/Coed/Intermediate (.5)

To improve skills of students having fundamental knowledge of gymnastics. Begins with conditioning and review. Includes apparatus, tumbling, and trampoline. Special emphasis on safety and spotting techniques. Students will develop routines from individual skills learned.

### 41. Tumbling and Trampoline (.5)

Tumbling and Trampoline is a progression of the basic concepts underlying the techniques, their application to human motion, and their relationship to other sports.

### 42. Triple Fitness Conditioning (.5)

This course is designed to attain enjoyable forms of individual levels of conditioning by participating in a combination of three aerobic activities (bicycling, swimming, running) which will provide an ultimate state of physical fitness. *Prerequisites: P.E. 1C, 1D, 33A, or 33C or consent of instructor.*

### 44A-B-C. Musical Theatre Dance (.5)

The study of characterization and technique of musical theatre dance, including folk and fad dances from 1900 to the present, partnering, tap dance, jazz dance, use of props and video sessions. *Prerequisite: one year dance technique or consent of instructor.*

### 46C. Fencing, EPEE (Electric), Intermediate (.5)

Classical French style, brief history, electrical equipment and safety, protocol and basic technique. Attacks, both simple and compound; defences, simple and compound; strategy and directing of bouts using French terminology. *Prerequisite: beginning foil or consent of instructor.*

### 47A-C. Fencing, Foil (.5)

Classical French style. Protocol, on guard, advance and retreat, attacks (simple and compound), parries (simple and compound), strategy, and basic rules. A = Beginning; C = Intermediate. All levels of foil will not be taught each quarter. *Prerequisite: 47C requires consent of instructor or 47A.*

### 48C. Fencing, Sabre (.5)

Designed for intermediate and advanced students of fencing to continue their training in classical Hungarian Sabre style fencing. (Sabre fencing may not be taught each quarter.) *Prerequisite: beginning and intermediate fencing (Foil).*

### 49. Fencing, Theatrical (.5)

Fencing techniques useful to students involved in performing arts. Emphasis will be upon choreography and dramatic presentation. *Prerequisite: fencing, (foil) beginning, (47A). Recommended: 47C.*

### 50A-B-C. Karate (.5)

Instruction and training in the fundamentals of Shotokan Karate, emphasizing: (1) basic stances and techniques; (2) "Kata," ancient stylized sequences of defensive and counter-offensive movements; (3) sparring, a graded progression from strictly controlled defense and counter-attack situations to free sparring for competition.

### 54A. First Aid (.5)

Standard first aid and personal safety course. Prepares the student to render life support first aid prior to making arrangements for transportation of victims. Training includes treatment of wounds, burns, poisoning, fractures, CPR, bandaging, splinting, heat and cold emergencies.

### 57. Self-Defense for Women (.5)

Designed to familiarize students, women particularly, with do's and don'ts of self-defense. Mainly directed toward students not involved in martial arts. Deals with psychology of self-defense situation. The course is structured so that a student may enter at any level of understanding and still benefit from the course.

**58A-B-C. Hatha Yoga (5)**

Hatha Yoga is regarded as the ancient art of physical fitness. It is a method of activity that suits the college student and can be an integral part of a sound approach to physical fitness and good health. This course will include body postures, breathing, relaxation and mental concentration. A = Beginning; C = Intermediate; E = Advanced. *Prerequisite:* 58C requires completion of 58A or consent of instructor; 58E requires completion of 58C or consent of instructor.

**59A. Applied Rehabilitation for Post Muscle and Joint Trauma (5)**

For students with muscle and joint trauma who need specific information and instruction concerning the nature of tissue injury and a rehabilitation program, and to give the student preventive measures useful in avoiding further injury. *Prerequisite:* referral of attending physician.

**59G. Physical Activity for the Disabled Student (5)**

Class activities designed to involve disabled students in a variety of individualized physical activities, modified sports and calisthenics; students will be encouraged to follow an individualized conditioning program as well as develop greater self-confidence.

**Intercollegiate Athletics (5)**

Note: Teams may be men's, women's, or coed. Check with the Intercollegiate Office (452-4211).

**62. Baseball****63. Basketball M/W****64. Crew M/W****65. Cross-Country M/W****67. Fencing M/W****68. Golf M/W****69. Rugby M (no credit)****70. Sailing (no credit)****71. Snow Skiing (no credit)****73. Soccer M/W****74. Softball W****75. Surfing (no credit)****76. Swimming M/W****77. Tennis M/W****78. Track and Field****79. Volleyball M/W****80. Water Polo M/W****83. Cycling (no credit)****86. Lacrosse (no credit)****P.E. Minor Theory Courses****81. Introduction to Physical Education (2)**

An introduction to historical, biochemical, physiological, psychological, and sociological foundations of physical education.

**84. Anatomy/Kinesiology (4)**

Study of anatomical and mechanical fundamentals of human motion. Qualitative and quantitative application of kinesiological principles to a variety of movement situations.

**120. Sports in America (4)**

This class will study and analyze the institution of sport in American life from a sociological perspective (i.e., social structure and processes) and focus on the reciprocal linkages of sport with other institutions such as politics, economics, education, and religion. *Prerequisites:* Sociology 1A-1B. (F,W)

**121. The Black Athlete (4)**

This class will study and analyze the role of the black athlete

in the institution of sports in American life from a sociological perspective (i.e., social structure and processes) with a brief social history from 1777 to the present.

**160. Exercise Physiology (4)**

The effects of exercise on the cardiovascular, respiratory, neuromuscular, and metabolic systems will be studied from the perspective of human physiology. Introductory laboratory techniques and procedures will be undertaken. Field trips to V.A., Scripps, and UCSD Medical Center. *Prerequisites:* lower-division chemistry and biology.

**160L. Exercise Physiology Lab (2)**

Having gained a theoretical background in P.E. 160, the students will apply the theoretical principles to laboratory experiences. Laboratory instruction in stress testing techniques and protocol, pulmonary function testing, exercise electrocardiography, specific bioassays to determine energy metabolism, and analytical electromyography will be taught. *Prerequisite:* P.E. 160. (F,W,S)

**170. Psychological Basis of Sport and Physical Activity (4)**

This course is a survey of human performance theory, learning and sport psychology as applied to the sport and physical activity domain. Specific topics include input, decision and effector mechanisms; memory and schema theory in learning motor skills; personality and sport participation and performance. *Prerequisite:* introductory psychology. (S)

**199. Special Studies (1-4)**

Supervised independent study and research in P.E. topics which are continuations of topics covered in physical fitness and health promotion minor. Student must be upper-division and in good standing (2.5 GPA). (Each individual proposal must be approved by CEP Subcommittee on Undergraduate Courses.) *Prerequisites:* Completion of courses in physical fitness and health promotion minor, consent of instructor, and approval of CEP Subcommittee on Undergraduate Courses.

**PHYSICS**

OFFICE: 3430 Mayer Hall, Revelle College

**Professors:**

Ami Berkowitz, Ph.D.  
Keith A. Brueckner, Ph.D.  
E. Margaret Burbidge, Ph.D. (Astronomy)  
Geoffrey R. Burbidge, Ph.D. (Emeritus)  
Joseph C. Y. Chen, Ph.D.  
Roger Dashen, Ph.D.  
George Feher, Ph.D.  
William R. Frazer, Ph.D. (Senior Vice President, Academic Affairs)  
Donald R. Fredkin, Ph.D.  
John M. Goodkind, Ph.D.  
Robert J. Gould, Ph.D.  
F. Duncan M. Hazdane, Ph.D.  
Francis R. Halpern, Ph.D. (Emeritus)  
Norman M. Kroll, Ph.D. (Chairman)  
Julius Kuti, Ph.D.  
Leonard N. Liebermann, Ph.D. (Emeritus)  
Ralph H. Lovberg, Ph.D.  
John H. Malmberg, Ph.D.  
M. Brian Maple, Ph.D.  
George E. Masek, Ph.D.  
Carl E. McIlwain, Ph.D.  
S. Maurice Montal, M.D., Ph.D.  
Melvin Y. Okamura, Ph.D.  
Thomas M. O'Neil, Ph.D.  
Laurence E. Peterson, Ph.D.

Oreste Piccioni, Ph.D. (Emeritus)  
Sheldon Schultz, Ph.D.  
Lu Jeu Sham, Ph.D. (Dean of Natural Sciences)  
H. Eugene Smith, Ph.D.  
Harry Suhl, Ph.D.  
Robert A. Swanson, Ph.D.  
William B. Thompson, Ph.D.  
Harold Ticho, Ph.D. (Vice Chancellor, Academic Affairs)  
Wayne Vernon, Ph.D.  
David Y. Wong, Ph.D.  
Nguyen-Huu Xuong, Ph.D.  
Herbert F. York, Ph.D.

**Associate Professors:**

Jorge E. Hirsch, Ph.D.  
Barbara Jones, Ph.D.  
Oscar Lumpkin, Ph.D.

**Assistant Professors:**

Andrei E. Ruckenstein, Ph.D.  
Douglas Toussaint, Ph.D.

**Professor-in-Residence:**

Henry D. I. Abarbanel, Ph.D.

**Adjunct Professors:**

Edward Creutz, Ph.D.  
Edward A. Frieman, Ph.D.  
John Greene, Ph.D.  
Nicholas Krall, Ph.D.  
Roy H. Neynaber, Ph.D.  
Tihiro Ohkawa, Ph.D.  
Philip M. Platzman, Ph.D.  
Shmuel Shtrikman, Ph.D.  
Ronald Waltz, Ph.D.

**Associate Adjunct Professor:**

Alan M. Eisner, Ph.D.

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The Department of Physics was established in 1960 as the first new department of the UCSD campus. Since then it has developed a strong faculty and student body with unusually diversified interests which lie primarily in the following areas:

1. Physics of elementary particles
2. Quantum liquids and superconductivity
3. Solid state and statistical physics
4. Plasma physics
5. Astrophysics and space physics
6. Atomic and molecular collision and structure
7. Biophysics
8. Geophysics
9. Science and public policy

In addition to on-campus research facilities, the high energy program uses accelerators at SLAC, Brookhaven, and Fermi Laboratory. The astrophysics program uses facilities at Lick Observatory, Mt. Lemmon, and Kitt Peak.



## PHYSICS

### The Undergraduate Program

The Department of Physics offers undergraduate programs leading to the following degrees:

- B.S. in physics
- B.S. in physics with specialization in biophysics
- B.S. in physics with specialization in biophysics-premedical
- B.S. in physics with specialization in earth sciences

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation.

### Physics Major

The upper-division program for physics majors is intended to provide basic education in several principal areas of physics, with some opportunity for study in neighboring areas in the form of restricted electives. Provision is made, both in the main courses and in the elective subjects, for some training in a few of the more technological aspects of physics.

In the junior year, the emphasis is on macroscopic physics; the two principal physics subjects are electromagnetism and mechanics. The mathematics background required for the physics program is completed in this year.

In the senior year, a sequence of courses in quantum physics provides the student the modern view of atomic and some aspects of sub-atomic physics and the principal analytical methods appropriate in this domain. The relation of the microscopic to the macroscopic world is the subject of courses in thermodynamics and statistical physics, with illustrations drawn from gas dynamics and solid-state physics. The quantum physics sequence aims at an integrated, descriptive, and analytical treatment of those areas of physics in which quantum effects are important, particularly atomic and nuclear physics and elementary particle physics.

Students may wish to incorporate a small portion of the physics major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major:

- a. Lower Division:
  - (1) Physics 2A-B-C-D and 2CL-DL; or Physics 3A-B-C-D, 3CL or 2CL, and 2DL.
  - (2) Chemistry 6A-B or 7A-B, and 8AL.
  - (3) Mathematics 2D-E-F, or 2DA-EA-F, or 3C-D-E.

- b. Upper Division:
  - (1) Physics 100A-B-C, 105, 110A-B, 120A-B, 130A-B, 140A-B, and two additional laboratory courses from the following group: 121, 131, 132, or 199 with departmental approval.
  - (2) Mathematics 110.
  - (3) Restricted Electives: Three upper-division or graduate courses in natural sciences or mathematics, subject to departmental approval. For students who do not minor in mathematics, one of these electives must be in mathematics (Math. 120A recommended).

c. Suggested Schedule:

| Fall               | Winter           | Spring       |
|--------------------|------------------|--------------|
| <b>Junior Year</b> |                  |              |
| Phys. 100A         | Phys. 100B       | Phys. 100C   |
| Phys. 105          |                  |              |
| Phys. 110A         | Phys. 110B       | Phys. 120A   |
| Math. 110          | Restr. Elec.     | Restr. Elec. |
| <b>Senior Year</b> |                  |              |
| Phys. 120B         | Phys. 121 or 131 | Phys. 132    |
| Phys. 130A         | Phys. 130B       | Restr. Elec. |
| Phys. 140A         | Phys. 140B       |              |

### Physics Major with Specialization in Biophysics

The upper-division program for physics majors with specialization in biophysics is essentially the same as the standard physics major with some modification to provide the education in biology and chemistry needed for advanced work in biophysics. Students entering the program with backgrounds deficient in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent rearrangement of the upper-division program will be devised by consultation between the student and the physics departmental adviser for biophysics.

The following courses are required for the physics major with specialization in biophysics:

- a. Lower Division:
  - (1) Physics 2A-B-C-D and 2CL-DL, or Physics 3A-B-C-D, 3CL or 2CL, and 2DL.
  - (2) Chemistry 6A-B-C or 7A-B, and 8AL-BL.
  - (3) Biology 1.
  - (4) Mathematics 2D-E-F, or 2DA-EA-F, or 3C-D-E.
- b. Upper Division:
  - (1) Physics 100A-B-C, 105, 110A, 120A-B, 130A-B, 153.
  - (2) Chemistry 131, 140A-B, 143A.
  - (3) Biology 101, 103, 106, 111, 131.
  - (4) Mathematics 110.

c. Suggested Schedule:

| Fall               | Winter     | Spring     |
|--------------------|------------|------------|
| <b>Junior Year</b> |            |            |
| Phys. 100A         | Phys. 100B | Phys. 100C |
| Phys. 105          | Biol. 131  |            |
| Phys. 110A         | Math. 110  | Phys. 120A |
| Chem. 140A         | Chem. 140B | Chem. 143A |
| <b>Senior Year</b> |            |            |
| Phys. 130A         | Phys. 130B | Phys. 153  |
| Phys. 120B         | Chem. 131  | Biol. 103  |
| Biol. 101          | Biol. 106  | Biol. 111  |

### Physics Major with Specialization in Biophysics-Premedical

The upper-division program for physics majors with specialization in biophysics-premedical is essentially the same as the standard physics major with some modification to provide the education in biology and chemistry needed for the study of medicine. Students entering the program with backgrounds deficient in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent rearrangement of the upper-division program will be devised by consultation between the student and the departmental adviser for biophysics.

The following courses are required for the physics major with specialization in biophysics-premedical:

- a. Lower Division:
  - (1) Physics 2A-B-C-D and 2CL-DL, or Physics 3A-B-C-D, 3CL or 2CL, and 2DL.
  - (2) Chemistry 6A-B-C or 7A-B, and 8AL-BL.
  - (3) Biology 1.
  - (4) Mathematics 2D-E-F, or 2DA-EA-F, or 3C-D-E.
- b. Upper Division:
  - (1) Physics 100A-B-C, 105, 110A, 120A-B, 130A, 153.
  - (2) Chemistry 126 or 131, 140A-B, 143A.
  - (3) Biology 101, 106, 111, 131.
  - (4) Mathematics 110.
  - (5) Restricted Elective: one biology course (Biology 121, 122, or 125).

c. Suggested Schedule:

| Fall               | Winter           | Spring       |
|--------------------|------------------|--------------|
| <b>Junior Year</b> |                  |              |
| Phys. 100A         | Phys. 100B       | Phys. 100C   |
| Phys. 105          | Math. 110        |              |
| Phys. 110A         | Biol. 131        | Phys. 120A   |
| Chem. 140A         | Chem. 140B       | Chem. 143A   |
| <b>Senior Year</b> |                  |              |
| Phys. 120B         |                  | Phys. 153    |
| Phys. 130A         | Chem. 126 or 131 | Restr. Elec. |
| Biol. 101          | Biol. 106        | Biol. 111    |

### Physics Major with Specialization in Earth Sciences

The upper-division program for physics majors with specialization in earth sci-



ences is essentially the same as the standard physics major augmented by courses in earth sciences.

The following courses are required for the physics major with specialization in earth sciences:

a. Lower Division:

- (1) Physics 2A-B-C-D and 2CL-DL, or Physics 3A-B-C-D, 3CL or 2CL, and 2DL.
- (2) Chemistry 6A-B or 7A-B, and 8AL.
- (3) Mathematics 2D-E-F, or 2DA-EA-F, or 3C-D-E.

b. Upper Division:

- (1) Physics 100A-B-C, 105, 110A-B, 120A-B, 130A, 140A-B.
- (2) Earth Science 101, 102, 103, 120.
- (3) Mathematics 110.
- (4) Restricted Electives: three upper-division or graduate courses to be chosen with the approval of the SIO earth science adviser.

c. Suggested Schedule:

| Fall               | Winter       | Spring       |
|--------------------|--------------|--------------|
| <b>Junior Year</b> |              |              |
| Phys. 100A         | Phys. 100B   | Phys. 100C   |
| Phys. 105          | Math. 110    | Phys. 120A   |
| Phys. 110A         | Phys. 110B   | ES 102       |
| ES 101             | ES 103       | ES 120       |
| <b>Senior Year</b> |              |              |
| Phys. 120B         | Restr. Elec. | Restr. Elec. |
| Phys. 130A         |              | Restr. Elec. |
| Phys. 140A         | Phys. 140B   |              |

### Engineering Physics Program

The engineering physics program is offered jointly by the Departments of Physics, AMES, and ECE, and is administered by the Department of ECE. (See "ECE, Engineering Physics Program.")

### Transfer Students

Students who have had prior course work in the major at other institutions should consult with the Department of Physics.

### Minor in Physics

Students may arrange minor programs or programs of concentration in physics by consulting with the Department of Physics.

### Advising Office

Detailed information may be obtained from the Department of Physics, Mayer Hall 3430, (619) 534-3290.

### The Graduate Program

The Department of Physics offers curricula leading to the following degrees:

M.S. in physics

C.Phil. in physics and biophysics

Ph.D. in physics

Ph.D. in physics and biophysics

Entering graduate students are required to have a sound knowledge of undergraduate mechanics, electricity and magnetism; to have had senior courses or their equivalent in atomic and quantum physics, nuclear physics, and thermodynamics; and to have taken upper-division laboratory work. An introductory course in solid-state physics is desirable.

### MASTER'S DEGREE PROGRAM

Requirements for the master of science degree can be met according to Plan II (comprehensive examination). (See "Graduate Studies: The Master's Degree.") The comprehensive examination is identical to the first-year written examination for Ph.D. students. A list of acceptable courses is available in the Department of Physics office. There is no foreign language requirement.

### DOCTORAL DEGREE PROGRAM

The department has developed a flexible Ph.D. program which provides a broad, advanced education in physics while at the same time giving students opportunity for emphasizing their special interests. This program consists of three components: graduate courses, apprenticeship in research, and thesis research. In addition, all students are expected to participate in the physics undergraduate teaching program. After passing the departmental examination and course requirements and before completing a dissertation, students are expected to take a total of no fewer than two units of Physics 500 (Physics Instruction). Each unit corresponds to approximately five hours per week for one quarter in laboratory sections, recitation sections, or problem sessions.

Entering students are assigned a faculty adviser to guide them in their program. Many students spend their first year as teaching assistants or fellows and begin apprentice research in their second year. After three years of graduate study, or earlier, they complete the departmental examinations and begin thesis research. Students specializing in biophysics make up deficiencies in biology and chemistry during the first two years and complete the departmental examinations by the end of their third year of graduate study. There is no foreign language requirement.

### Entrance Testing

An entrance test covering undergraduate physics is given to entering graduate students during registration week for the purpose of enabling the faculty to give them better guidance in their graduate work. Performance on this test has no bearing on the students' status in graduate school.

### Requirements for the Ph.D.

Students are required to pass a written examination, advanced graduate courses, an oral topic examination, a qualifying examination, and a final defense of the thesis as described below.

#### 1. Departmental Written Examination

Physics students are required to take a written examination after completing one year of graduate work at UCSD. The examination is on the level of material usually covered in upper-division courses and the graduate courses listed below:

##### Fall

Phys. 200A (Theoretical Mechanics)  
Phys. 203A (Adv. Classical  
Electrodynamics)  
Math. 210A (Mathematical Methods)

##### Winter

Phys. 200B (Theoretical Mechanics)  
Phys. 203B (Adv. Classical  
Electrodynamics)  
Phys. 212A (Quantum Mechanics)

##### Spring

Phys. 210A (Statistical Mechanics)  
Phys. 212B (Quantum Mechanics)  
Math. 210C (Mathematical Methods)

The examination is offered twice a year, at the beginning of the fall and spring quarters, and lasts two days, four hours per day. The examination may be repeated once, the next time it is offered.

Biophysics students take the written examination after completing two years of graduate work.

#### 2. Advanced Graduate Courses

Physics students are required to take six advanced graduate courses, selected from *at least three of the groups* listed below, no later than the end of the third year of graduate work. A 3.0 average in five of the six courses is required. (In lieu of the course requirement, students may petition to take an oral examination covering three areas of physics.)

**Group 1:** Physics 218A, 218B (Plasma); 221 (Adv. Mech.); 232 (Adv. Plasma)

## PHYSICS

**Group 2:** Physics 210B (Stat. Mech.); 211 (Solid State); 230A, 230B (Adv. Solid State); 236 (Many-body Th.)

**Group 3:** Physics 212C (Quant. Mech.); 215A, 215B, 215C (Elem. Part.); 233 (Elem. Part. Th.)

**Group 4:** Physics 220 (Group Th.); Math 259A, 259B, 259C (Geom. Phys.)

**Group 5:** Physics 206 (Biophys.); 213 (Nuc.); 216 (Atomic); 225A, 225B (Relativ.); 231 (Collision Th.)

**Group 6:** Physics 223A (Stel. Str.); 223B (Intrstel. Med.); 223C (Sp. Plasma); 223D (Stel. Atm. & Rad. Trans.); 223E (Gal. & Cosmol.); 223F (HE Astro.)

Biophysics students select six courses from biology, biochemistry, chemistry, or physics in consultation with their adviser. At least three courses must be graduate courses.

### 3. Oral Topic Examination

Physics students are required to take an oral topic examination at the beginning of the third year of graduate work. Three topics of current interest in physics or biophysics are announced two weeks prior to the examination week, and a list of relevant references is supplied. Students select one of the topics and present a one-half hour talk on it to a faculty examination committee. The oral presentation is followed by approximately one hour of questioning generally related to the topic. This examination is offered twice a year, at the beginning of the fall and spring quarters, and may be repeated once, the next time it is offered.

Biophysics students take this examination no later than the spring of the third year of graduate work.

### 4. Qualifying Examination and Advancement to Candidacy

In order to be advanced to candidacy, students must have met the departmental requirements and obtained a faculty research supervisor. At the time of application for advancement to candidacy, a doctoral committee responsible for the remainder of the student's graduate program is appointed by the Graduate Council. The committee conducts the Ph.D. qualifying examination during which students must demonstrate the ability to en-

gage in thesis research. Usually this involves the presentation of a plan for the thesis research project. The committee may ask questions directly or indirectly related to the project and questions on general physics which it determines to be relevant. Upon successful completion of this examination, students are advanced to candidacy and are awarded the C.Phil. degree.

### 5. Thesis Defense

When students have completed their theses, they are asked to present and defend them before their doctoral committees.

### Departmental Colloquium

The department offers a weekly colloquium on topics of current interest in physics and on departmental research programs. Students are expected to register for and attend the colloquium.

### Supplementary Course Work and Seminars

The department offers a set of seminars in the main departmental areas of interest. Students are strongly urged to enroll for credit in seminars related to their research interests and, when appropriate, to enroll in advanced graduate courses beyond the departmental requirement.

### Course Credit by Examination

Students have an option of obtaining credit for a physics graduate course by taking the final examination without participating in any class exercises. They must, however, officially register for the course and notify the instructor and the department office of their intention no later than the first week of the course.

## Courses

### Lower Division

The following courses will be offered in 1987-88:

| Fall     | Winter    | Spring   |
|----------|-----------|----------|
| Phys 1A  | Phys 1A   | Phys 1AL |
| Phys 1C  | Phys 1AL  | Phys 1B  |
| Phys 2A  | Phys 1B   | Phys 1C  |
| Phys 2AS | Phys. 1CL | Phys 1CL |
| Phys 2AL | Phys 2A   | Phys 2B  |
| Phys 2C  | Phys 2AS  | Phys 2BS |
| Phys 2CS | Phys 2AL  | Phys 2C  |
| Phys 2CL | Phys 2B   | Phys 2CS |
| Phys 2D  | Phys 2BS  | Phys 2CL |
| Phys 2DL | Phys 2D   | Phys 3C  |
| Phys 3A  | Phys 2DL  | Phys 3CL |
| Phys 3D  | Phys 3B   | Phys 5   |
|          | Phys 9    | Phys 10  |
|          |           | Phys 11  |

The Physics 1 sequence is acceptable for biology and chemistry majors.

The Physics 2 sequence is intended for physical science and engineering majors and those biological science majors with strong mathematical aptitude.

The Physics 3 sequence is an honors sequence for students who have a strong high school physics and calculus background and who are capable of carrying a heavy workload.

#### 1A. General Physics — Mechanics (4)

A calculus-based introductory physics course covering vectors, equilibrium of a particle, motion on a straight line, Newton's second law and gravitation, motion in a plane, work and energy, impulse and momentum, equilibrium of a rigid body, rotation, periodic motion and fluid statics. *Prerequisites:* Math. 1A and concurrent enrollment in Math. 1B; or concurrent enrollment in Math. 2A. (F,W)

#### 1AL. General Physics Laboratory — Mechanics and Fluids (1)

Four three-hour laboratories covering statistical analysis of experimental data, viscosity and rotational motion, fluid flow, and mechanical oscillations. *Prerequisite:* prior or concurrent enrollment in Phys. 1A. (W,S)

#### 1B. General Physics — Electricity and Magnetism (4)

Continuation of Physics 1A covering Coulomb's law, Gauss's law, potential, capacitance, current, resistance and electromotive force, direct-current circuit and instruments, the magnetic field, magnetic forces on current-carrying conductors, magnetic field of a current, induced electromotive force, inductance, magnetic properties of matter and alternating currents. *Prerequisites:* Phys. 1A and concurrent enrollment in Math. 1C or Math. 2B. (W,S)

#### 1C. General Physics — Waves, Optics, Relativity, and Quantum Physics (4)

Continuation of Physics 1B covering traveling waves, electromagnetic waves, the nature and propagation of light, geometric optics, interference and diffraction, relativistic mechanics, photons, electrons and atoms, quantum mechanics, atoms, molecules and solids, nuclear physics. *Prerequisites:* Phys. 1B and Math. 1C or Math. 2B. (F,S)

#### 1CL. General Physics Laboratory — Electricity and Magnetism and Optics (1)

Four three-hour laboratories covering the cathode ray oscilloscope and wave generator, the R-C circuit, lenses and the eye, and optical spectra and the diffraction grating. *Prerequisites:* Phys. 1B, and prior or concurrent enrollment in Phys. 1C. (W,S)

#### 2A. Physics — Mechanics (4)

A calculus-based science-engineering general physics course covering vectors, motion in one and two dimensions, Newton's first and second laws, work and energy, conservation of energy, linear momentum, collisions, rotational kinematics, rotational dynamics, equilibrium of rigid bodies, oscillations, gravitation. *Prerequisites:* Math. 2A and concurrent enrollment in Math. 2B. (F,W)

#### 2AS. Physics — Mechanics (4)

Same as Physics 2A except that it is offered as a self-paced (Keller plan) course. *Prerequisites:* Math. 2A and concurrent enrollment in Math. 2B. (F,W)

#### 2AL. Physics Laboratory — Mechanics and Fluids (2)

One hour lecture and three hours laboratory. Experiments to be chosen from introduction to data reduction and error analysis, linear and rotational forces, conservation of energy and momentum, mechanical oscillations, angular momentum and moment of inertia, viscosity and rotational motion, fluid flow, and collisions. Department stamp required. *Prerequisite:* prior or concurrent enrollment in Phys. 2A, 2AS, or 3A. (F,W)

#### 2B. Physics — Electricity and Magnetism (4)

Continuation of Physics 2A covering charge and matter, the electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, electromotive force and circuits, the magnetic field, Ampere's law, Faraday's law, inductance, electromagnetic oscillations, alternating currents

and Maxwell's equations. *Prerequisites:* Phys. 2A, Math. 2B, and concurrent enrollment in Math. 2C. (W,S)

### 2BS. Physics — Electricity and Magnetism (4)

Same as Physics 2B, except that it is offered as a self-paced (Keller plan) course. *Prerequisites:* Phys. 2A, Math. 2B, and concurrent enrollment in Math. 2C. (W,S)

### 2C. Physics — Fluids, Waves, Heat, Thermodynamics, and Optics (4)

Continuation of Physics 2B covering fluid mechanics, waves in elastic media, sound waves, temperature, heat and the first law of thermodynamics, kinetic theory of gases, entropy and the second law of thermodynamics, Maxwell's equations, electromagnetic waves, geometric optics, interference and diffraction. *Prerequisites:* Phys. 2B, Math. 2C, and concurrent enrollment in Math. 2D or 2DA. (F,S)

### 2CS. Physics — Fluids, Waves, Heat, Thermodynamics, and Optics (4)

Same as Physics 2C, except that it is offered as a self-paced (Keller plan) course. *Prerequisites:* Phys. 2B, Math. 2C, and concurrent enrollment in Math. 2D or 2DA. (F,S)

### 2CL. Physics Laboratory — Electricity and Magnetism, Waves, Optics (2)

One hour lecture and three hours' laboratory. Experiments to be chosen from refraction and interference using a laser, refraction, interference and diffraction of microwaves, lenses and the eye, acoustic resonance, the cathode ray oscilloscope and R-C circuits, LRC circuits, oscillations and damping, resonance and damping, measurement of magnetic fields, and the mechanical equivalence of heat. *Prerequisite:* prior or concurrent enrollment in Phys. 2C, 2CS, or 3C. (F,S)

### 2D. Physics — Relativity and Quantum Physics (4)

A modern physics course covering atomic view of matter, electricity and radiation, atomic models of Rutherford and Bohr, relativity, X-rays, wave and particle duality, matter waves, Schrödinger's equation, atomic view of solids, natural radioactivity. *Prerequisites:* Phys. 2B and Math. 2D or 2DA. (F,W)

### 2DS. Physics — Relativity and Quantum Physics (4)

Same as Physics 2D except that it is offered as a self-paced (Keller plan) course. *Prerequisites:* Phys. 2B and Math. 2D or 2DA. (Not offered in 1987-88, except in Summer Session.)

### 2DL. Physics Laboratory — Modern Physics (2)

One hour of lecture and three hours of laboratory. Experiments to be chosen from refraction, diffraction and interference of microwaves, Hall effect, thermal band gap, optical spectra, coherence of light, photoelectric effect,  $e/m$  ratio of particles, radioactive decays, and plasma physics. *Prerequisites:* 2AL or 2CL, prior or concurrent enrollment in Phys. 2D, 2DS, or 3D. (F,W)

### 3A. Honors Physics — Mechanics (4)

An honors course for students with serious interest in physics and strong high school physics and calculus background. The topics covered are in close parallel to those in the Physics 2 sequence, but the students are expected to carry significantly heavier workload in Physics 3. Fluid mechanics, heat and temperature are omitted in this sequence, but Maxwell's theory of electricity and magnetism will be covered in depth. The topics covered in Physics 3A are vectors, motion in one and two dimensions, particle dynamics, work and energy, conservation of energy, conservation of linear momentum, collisions, rotational kinematics, rotational dynamics, oscillations, gravitation. *Prerequisites:* Math. 2A and concurrent enrollment in Math. 2B. (Students who have had a strong one-year calculus course in high school are encouraged to enroll in Math. 3C concurrently.) (F)

### 3B. Honors Physics — Electricity and Magnetism (4)

Continuation of Physics 3A covering charge and matter, electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, electromotive force and circuits, magnetic field, Ampere's law, Faraday's law, inductance, electromagnetic oscillations, alternating current, Maxwell's equations. *Prerequisites:* Phys. 3A, and concurrent enrollment in Math. 2C or 3D. (W)

### 3C. Honors Physics — Waves and Optics (4)

Continuation of Physics 3B covering waves in elastic media, sound waves, Maxwell's equations, electromagnetic waves, the nature and propagation of light, reflection and refraction, geometric optics, interference, diffraction, polarization. *Prerequisites:* Phys. 3B and concurrent enrollment in Math. 2D, 2DA, or 3E. (S)

### 3CL. Honors Physics Laboratory — Electricity and Magnetism (2)

An honors laboratory involving statistical analysis, electric fields, LRC circuits and magnetic fields. One hour of lecture and three hours' laboratory per week. *Prerequisite:* concurrent enrollment in Phys. 3C. (S)

### 3D. Honors Physics — Relativity and Quantum Physics (4)

A modern physics course covering relativistic kinematics, relativistic dynamics, particle aspects of electromagnetic radiation, wave aspects of material particles, the structures of the hydrogen atom, many-electron atoms, nuclear structure, molecular and solid state physics. *Prerequisites:* Phys. 3C and Math. 2D, 2DA, or 3E. (F)

### 5. The Skies (4)

Introductory descriptive (non-mathematical) account of modern astronomy, with emphasis on what is observed and on the development of ideas. The earth's place in the universe, the sun, the birth, life and death of stars, galaxies and cosmology. This course, Earth Sciences 1 (The Oceans), and Earth Sciences 4 (The Nature of the Earth) form a three-course sequence for general interest in science. (S)

### 9. Elementary Quantitative Methods (1)

A self-paced tutorial course designed to help students acquire the basic quantitative skills necessary for any physics course. Topics covered are powers of ten, scientific notation, units of measurement, order of magnitude, and constant speed motions. (P/NP grades only.) (W)

### 10. Introductory Physics (4)

This is a one-quarter general physics course for nonscience majors. Topics covered are linear motion, Newton's laws, circular motion and gravitation, momentum and energy, temperature, heat, first and second laws of thermodynamics, electric charge and electric field, electric potential and electric energy, electric currents. *Prerequisites:* college algebra (community college Math. 140) and Phys. 9 or equivalent. Students without Physics 9 credit must pass an equivalency test during the first week of class. (S)

### 11. Introduction to General Physics (4)

This course is designed to introduce potential science majors to concepts in physics and to prepare them for further sequences in the sophomore year. Topics include kinematics, dynamics, energy momentum, and thermodynamics. Emphasis will be on problem solving. *Prerequisite:* Math. 1A or 2A (or concurrent enrollment). (S)

## Upper Division

(See also course listings: "Frontiers of Science.")

### 100A. Electromagnetism (4)

Coulomb's law, electric fields, electrostatics; conductors and dielectrics; steady currents, elements of circuit theory. Four hours' lecture. *Prerequisites:* Phys. 2C or 3C, Math. 2D-E-F or 3C-D-E. (F)

### 100B. Electromagnetism (4)

Magnetic fields and magnetostatics, magnetic materials, induction, AC circuits, displacement currents; development of Maxwell's equations. Three hours' lecture. *Prerequisites:* Phys. 100A, 105. (W)

### 100C. Electromagnetism (4)

Electromagnetic waves, radiation theory; application to optics; motion of charged particles in electromagnetic fields; relation of electromagnetism to relativistic concepts. Four hours' lecture. *Prerequisites:* Phys. 100B, 105. (S)

### 105. Computational Physics (2)

Interactive computing, FORTRAN programming, numerical methods, using numerical software, introductory graphics and use of graphics software, data analysis and statistical packages, symbolic manipulation. (Note: Students may not receive credit for both Physics 105 and any of the following courses: ECE 64, Math. 74, Math. 170A-B-C, Math. 174, Chem. 134, Biol. 181.) One to two hours' lecture, three hours' laboratory. *Prerequisites:* Phys. 2A-B-C-D or equivalent; Math. 2A-B-C-D-E or 3C-D-E or equivalent. (F,S)

### 110A. Mechanics (4)

Mechanics of systems of particles; conservation laws, planetary motion; linear oscillators; statics and dynamics of plane rigid bodies. Four hours' lecture. *Prerequisites:* Phys. 2C or

3C, Math. 2D-E-F (co-registration in Math. 2F permitted) or 3D-E-F. (F)

### 110B. Mechanics (4)

Special relativity; Lagrange's and Hamilton's equations; small oscillations of coupled systems; noninertial frames; general motion of rigid bodies. Four hours' lecture. *Prerequisites:* Phys. 105, 110A, Math. 2F or 3E. (W)

### 120A-B. Physical Measurements (4-4)

A laboratory-lecture course in physical measurements with an emphasis on electronic methods. Topics include circuit theory, special circuits. Fourier analysis, noise, transmission lines, transistor theory, amplifiers, feedback, operational amplifiers, oscillators, pulse circuits, digital electronics. Three hours' lecture, four hours' laboratory. *Prerequisites:* Phys. 2CL or 3CL and 2DL, Phys. 100A-B. (S,F)

### 121. Experimental Techniques (4)

A laboratory-lecture course on the performance of scientific experiments with an emphasis on the use of microcomputers for control and data handling. Topics include microcomputer architecture, interfacing, and programming, digital to analog and analog to digital conversion, asynchronous buses, interrupt and control techniques, transducers, actuators, digital signal processing — signal filtering, deconvolution, averaging and detection, construction techniques — soldering, parts selection, assembly methods, project management — planning, funding, scheduling, and utilization of personnel. Three hours' lecture, four hours' laboratory. *Prerequisites:* Phys. 120A-B or equivalent. (W)

### 130A. Quantum Physics (4)

Phenomena which led to the development of quantum mechanics. Wave mechanics; the Schrödinger equation, interpretation of the wave function, the uncertainty principle, piece-wise constant potentials, simple harmonic oscillator, central field and the hydrogen atom. Four hours' lecture. *Prerequisites:* Math. 110 or equivalent. Phys. 2D or equivalent, 100A-B-C or equivalent, 105. (F)

### 130B. Quantum Physics (4)

Observables and measurements, matrix mechanics, angular momentum and spin, the variational principle, perturbation theory. Atomic physics, Zeeman effect, spin-orbit interaction, fine structure principle. Four hours' lecture. *Prerequisites:* Phys. 105, 110A, 130A. (W)

### 130C. Quantum Physics (4)

Elementary nuclear physics, quantum mechanics of radiation, elementary particles and scattering. Three hours' lecture. *Prerequisites:* Phys. 100C, 130B. (S)

### 131. Modern Physics Laboratory (2)

Experiments in radioactivity, X-rays, atomic physics, resonance physics, solid-state physics, etc. One hour lecture, four hours' laboratory. *Prerequisites:* Phys. 2CL or 3CL and 2DL, Phys. 130A. (W)

### 132. Modern Physics Laboratory (2)

Experiments in atomic physics, optics, physical electronics, fluid dynamics, surface physics, etc. One hour lecture, four hours' laboratory. *Prerequisites:* Phys. 2CL or 3CL and 2DL, Phys. 130A-B. (S)

### 140A-B. Thermal Physics (4)

Thermodynamics, including the first, second, and third laws; thermodynamic potentials; phase transitions; applications to low-temperature physics, radiation and chemical reactions. Elementary statistical mechanics, probabilistic interpretation of entropy, fluctuation phenomena, transport phenomena. Four hours' lecture. *Prerequisites:* Phys. 105, 110A. (F,W)

### 150. Continuum Mechanics (4)

Mechanics of continuous media; waves, instabilities, applications to earth sciences, oceanography and aerodynamics. Three hours' lecture. *Prerequisite:* Phys. 110B. (S)

### 151. Plasma Physics (4)

Particle motions, plasmas as fluids, waves, diffusion, equilibrium and stability, nonlinear effects, controlled fusion. Three hours' lecture. *Prerequisites:* Phys. 100A-B, 110A. (S)

### 152. Introduction to Solid-State Physics (4)

Crystal symmetry, free electron gas, band structure, properties of insulators, semiconductors and metals; atomic diffusion, alloys, electric transport phenomena. Four hours' lecture. *Prerequisites:* Phys. 130B, 140B. (S)

## PHYSICS

### 153. Topics in Biophysics/Photobiology (4)

(Course content varies yearly.) Basic principles of photobiology and photochemistry. Photochemical mechanisms in photosynthesis. Photoreceptor pigment systems and photobiological control mechanisms in living organisms. Three hours' lecture. (Same as Biology 109.) *Prerequisite: upper-division standing in biology, chemistry, or physics, or consent of instructor.* (S)

### 160. Survey of Astronomy and Astrophysics (4)

Introduction to modern astronomy and astrophysics. Three hours' lecture. *Prerequisite: Phys. 110A.* (F)

### 161. Astrophysics (4)

The physics of stars, interstellar matter, and stellar systems. Three hours' lecture. *Prerequisites: Phys. 130A, 160.* (W)

### 162. Astrophysics (4)

Continuation of Physics 161. Three hours' lecture. *Prerequisites: Phys. 130B, 140B, 161.* (S)

### 182. Atmospheric Physics and the Physics of Flight (4)

The application of basic physical principles to a study of the earth's atmosphere and to aircraft flight and operations in the earth's atmosphere. Three hours' lecture. *Prerequisites: freshman calculus, mechanics, electricity, and magnetism.* (S)

### 195. Physics Instruction (2)

Students will be responsible for and teach a class section of a lower-division physics course. They will also attend a weekly meeting on teaching methods and materials conducted by the professor who supervises their teaching. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

### 198. Directed Group Study (2 or 4)

Directed group study on a topic or in a field not included in the regular departmental curriculum. (P/NP grades only.) *Prerequisites: consent of instructor and departmental chairman.* (F,W,S)

### 199. Special Project (2 or 4)

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisites: consent of instructor and departmental chairman.* (F,W,S)

## Graduate

### 200A. Theoretical Mechanics (5)

Lagrange's equations and Hamilton's principle; Lagrangian for charges in electric and magnetic fields and for electromechanical systems, symmetry and constants of the motion, central forces and scattering theory, small oscillations, guiding center theory, parametric instabilities, ponderomotive effect, adiabatic invariants *Prerequisite: Phys. 110B or equivalent.* (F)

### 200B. Theoretical Mechanics (4)

Hamilton's equations, canonical transformations, Hamilton-Jacobi theory, action-angle variables, canonical perturbation theory, adiabatic invariants, surface of sections, KAM theorem. *Prerequisite: Phys. 200A.* (W)

### 203A. Advanced Classical Electrodynamics (4)

Electrostatics, symmetries of Laplace's equation and methods for solution, boundary value problems, electrostatics in macroscopic media, magnetostatics, Maxwell's equations, Green functions for Maxwell's equations, plane wave solutions, plane waves in macroscopic media. *Prerequisite: Phys. 100C or equivalent.* (F)

### 203B. Advanced Classical Electrodynamics (5)

Special theory of relativity, covariant formulation of electrodynamics, radiation from current distributions and accelerated charges, multipole radiation fields, waveguides and resonant cavities. *Prerequisite: Phys. 203A.* (W)

### 206. Topics in Biophysics and Physical Biochemistry (4)

(Same as Biology 206, Chemistry 206.) Selection of topics of current interest. Examples: primary processes of photosynthesis; membrane biophysics; applications of physical methods to problems in biology and chemistry, e.g., magnetic resonance, X-ray diffraction, fluctuation spectroscopy, optical techniques (fluorescence, optical rotary dispersion, circular dichroism). Topics may vary from year to year. *Prerequisite: consent of instructor.* (W)

### 210A. Statistical Mechanics (4)

Statistical description of physical systems; entropy and density matrix, equilibrium distributions; microcanonical, canonical, and grand canonical ensembles. Derivation of laws of thermodynamics. Ideal gas; Boltzmann, Fermi and Bose statistics, theory of dilute solutions, imperfect gas. Kinetic theory; the master equation, Boltzmann equation, applications to transport phenomena, fluctuation and dissipation, Onsager's relations. *Prerequisite: Phys. 140A-B, 152, or equivalent; Phys. 212A and concurrent enrollment in Phys. 212B.* (S)

### 210B. Statistical Physics (4)

Finite temperature perturbation theory. Transport theory; Kubo and Mori theories, correlation and scattering functions, fluctuation and dissipation theorem, Einstein relation. Brownian motion. Self-consistent field theory and applications. Phase transition and critical phenomena; phase diagrams, second order phase transitions, Landau theory, scaling, renormalization group. (F)

### 211. Solid-State Physics (5)

Basic graduate course in solid-state physics, dealing with topics such as lattice dynamics, magnetism in insulators, electronic band structure, transport phenomena and electrodynamics in metals, optical properties. *Prerequisite: Phys. 152 or equivalent.* (W)

### 212A-B. Quantum Mechanics (5-5)

Physical and mathematical basis of quantum mechanics, the Schrödinger equation and the quantum mechanics of one-particle system, matrices and the transformation theory of quantum mechanics, the path integral formulation of quantum mechanics, density matrix, translational and rotational invariance, angular momentum and spin, theory of scattering, approximation methods for discrete stationary states, time-dependent perturbation theory, theory of scattering, quantum theory of atomic structure, quantum theory of radiation, theory of second quantization. *Prerequisite: Phys. 130B or equivalent.* (W,S)

### 212C. Quantum Mechanics (5)

The Dirac equation, theory of the fine structure in the hydrogen atom, hyperfine splitting of atomic energy levels, electron and positron solutions of the Dirac equation and the hole theory, quantization of free fields, energy-momentum tensor, the interaction of the electron-positron field with the photon field, calculation of S-matrix elements in quantum electrodynamics, Feynman diagrams. *Prerequisite: Phys. 212B.* (F)

### 213. Theoretical Nuclear Physics (4)

Basic phenomenology of strong interactions; two and three-nucleon systems; weak and electromagnetic interactions of nucleons; thermonuclear reactions; nuclear systematics, models of nuclear structure, particle-transfer reactions, fission; introductory BCS pairing and nuclear matter theory. *Prerequisites: Phys. 130C or equivalent, Phys. 212C.* (W)

### 215A. Elementary Particle Physics (4)

The first quarter of a three-quarter course in elementary particle physics. Classification of elementary particles using symmetries and invariance principles, calculation of cross sections and reaction rates, covariant perturbation theory, quantum electrodynamics, regularization and renormalization, quark model, gauge theory of strong interactions. *Prerequisite: Phys. 212C.* (W)

### 215B. Elementary Particle Physics (4)

Continuation of 215A. Phenomenology of strong interactions, experimental tests of QCD, spontaneous symmetry breaking, Weinberg-Salam model of weak interactions. *Prerequisite: Phys. 215A.* (S/U grades permitted.) (S)

### 215C. Elementary Particle Physics (4)

Continuation of 215B. Unified models of the interactions, cosmology and particle physics, special topics in elementary particle physics. *Prerequisite: Phys. 215B.* (S/U grades permitted.) (F)

### 216. Atomic and Molecular Physics (4)

Structure of atoms, the Hartree-Fock method, correlation energy and relativistic corrections. Structure of molecules, the Born-Oppenheimer method, the molecular electronic state, the stability and build-up of molecules, molecular orbital theory. The interaction of atoms and molecules with external fields. Atomic and molecular collisions. *Prerequisite: Phys. 212A.* (F)

### 218A. Plasma Physics (4)

The basic physics of plasmas is discussed for the simple

case of an unmagnetized plasma. Topics include: thermal equilibrium statistical properties, fluid and Landau theory of electron and ion plasma waves, velocity space instabilities, quasi-linear theory, fluctuations, scattering or radiation, Fokker-Planck equation. (F)

### 218B. Plasma Physics (4)

This course deals with the magnetized plasma. Topics include: Appleton-Hartree theory of waves in cold plasma, waves in warm plasma (Bernstein waves, cyclotron damping). MHD equations, MHD waves and shocks, MHD theory of equilibrium and stability (interchange stability), adiabatic invariants and drift model of interchange instability, drift waves. *Prerequisite: Phys. 218A.* (W)

### 220. Group Theoretical Methods in Physics (4)

Study of the representations and applications of groups to problems in physics, with particular emphasis on the permutation of unitary groups. *Prerequisite: Phys. 212C.* (S/U grades permitted.) (F)

### 221. Advanced Mechanics (4)

Advanced topics in the theory of nonlinear dynamics. *Prerequisite: Phys. 200B.* (S/U grades permitted.) (S)

### 222. Advanced Nuclear Physics (4)

Topics of current interest. Example: ambiguities in the nuclear two-body problem, three-nucleon systems and Faddeev equations, recent developments in the theory of nuclear matter and finite nuclei, exotic nuclei. *Prerequisite: Phys. 213.* (S/U grades permitted.) (S)

### 223A. Stellar Structure and Evolution (4)

Energy generation, flow, hydrostatic equilibrium, equation of state. Dependence of stellar parameters (central surface temperature, radius, luminosity, etc.) on stellar mass and relation to physical constants. Relationship of these parameters to the H-R diagram and stellar evolution. Stellar interiors, opacity sources, radiative and convective energy flow. Nuclear reactions, neutrino processes. Polytropic models. White dwarfs and neutron stars. *Prerequisites: Phys. 130C or equivalent, Phys. 140A-B or equivalent.* (S/U grades permitted.) (Offered in alternate years.) (F)

### 223B. Physics of the Interstellar Medium (4)

Gaseous nebulae, molecular clouds, ionized regions, and dust. Low energy processes in neutral and ionized gases. Interaction of matter with radiation, emission and absorption processes, formation of atomic lines. Energy balance, steady state temperatures, and the physics and properties of dust. Masers and molecular line emission. Dynamics and shocks in the interstellar medium. *Prerequisites: Phys. 130A-B or equivalent, Phys. 140A-B or equivalent.* (S/U grades permitted.) (Offered in alternate years.) (W)

### 223C. Space Plasmas (4)

Planetary magnetospheres, the interplanetary medium, the solar wind, and comets. Application of plasma physics to solar system processes. Fluid and kinematic properties of winds. Energetic particle transport in radiation belts and the interplanetary medium. Waves and instabilities in large scale plasmas. *Prerequisites: Phys. 100C or equivalent, Phys. 151 or equivalent.* (S/U grades permitted.) (Offered in alternate years.) (S)

### 223D. Stellar Atmospheres and Radiative Transfer (4)

The equation of transfer. Grey atmospheres. Absorption and emission of radiation. Radiative transfer in spectral lines. Statistical equilibrium. Radiative transfer in multi-level atomic systems. Line broadening and frequency redistribution. Approximations to the radiative transfer equation. The atmospheres of late and early type stars. Extended atmospheres. Radiative transfer in moving atmospheres. *Prerequisites: Phys. 130A-B or equivalent, Phys. 140A-B or equivalent.* (S/U grades permitted.) (Offered in alternate years.) (F)

### 223E. Galaxies and Cosmology (4)

The structure and dynamics of galaxies. Active galaxies and QSO's. The large scale structure of the universe. Determination of  $H_0$  (Hubble constant) and  $q_0$  (the deceleration parameter). Physical cosmology:  $1nN$  versus  $1nS$ , processes in an expanding universe. Cosmological models. Processes in the Big-Bang. Helium and deuterium production. The very early universe, inflationary models of the universe. *Prerequisite: consent of instructor.* (S/U grades permitted.) (Offered in alternate years.) (W)

### 223F. High Energy Astrophysics (4)

Cosmic rays, radio sources, X-ray sources, and compact ob-



jects. Electromagnetic processes such as synchrotron radiation, Compton scattering, thermal and non-thermal bremsstrahlung, pair production. Strong- and weak-interaction processes such as pion production, neutrino production, etc. *Prerequisites: Phys. 100C or equivalent, Phys. 130A-B-C or equivalent.* (S/U grades permitted.) (Offered in alternate years.) (S)

**225A-B. General Relativity and Cosmology (4-3)**

The principle of covariance, tensors and tensor transformations in special relativity, the principle of equivalence; tensor calculus; foundations of general relativity, applications and tests of the theory, gravitational waves; applications in cosmology and observational tests of cosmological theories. *Prerequisite: consent of instructor.* (S/U grades permitted.) (S,F)

**230A. Advanced Solid-State Physics (4)**

A sequel to Physics 211 for students intending to specialize in solid-state physics and related subjects. Examples of topics to be covered are electron-electron and electron-phonon interactions, superconductivity, Landau theory of Fermi liquids, surfaces, disordered systems. *Prerequisite: Phys. 211.* (S/U grades permitted.) (S)

**230B. Advanced Solid-State Physics (4)**

Selection of topics of current interest. Examples: magnetic and electric resonances, surface physics, superconductivity, ferroelectrics, disordered systems, phase transitions, liquid helium, ferromagnetism. Topics given in this course may vary from year to year. *Prerequisite: Phys. 211.* (S/U grades permitted.) (F)

**231. Collision Theory (4)**

Collision theory and its application to atomic and molecular processes. Description of collision processes, scatterings and resonances in composite systems. Rearrangement collisions and the methods of approximation. *Prerequisites: Phys. 212A-B.* (S/U grades permitted.) (S)

**232. Advanced Plasma Physics (4)**

An advanced course treating topics of current research interest, such as: weak turbulence theory, fusion, diagnostic techniques, etc. *Prerequisites: Phys. 218A-B.* (S/U grades permitted.) (F)

**233. Elementary Particle Theory (4)**

Current problems in elementary particle theory. *Prerequisite: Phys. 215A.* (S/U grades permitted.) (W)

**236. Many-Body Theory (4)**

Effects of interactions in large quantum mechanical systems at zero or finite temperature analyzed from a unified viewpoint. Symmetries, conservation laws, perturbation theory, sum rules, inequalities. Applications to Bose, Fermi, normal, superfluid, charged, neutral, degenerate, dilute, etc., systems. *Prerequisites: Phys. 210A-B, 212C.* (S/U grades permitted.) (S)

**239. Special Topics (1-3)**

From time to time a member of the regular faculty or a resident visitor will find it possible to give a self-contained short course on an advanced topic in his or her special area of research. This course is not offered on a regular basis, but it is estimated that it will be given once each academic year. (S/U grades permitted.)

**250. Condensed Matter Physics Seminar (0-1)**

Discussion of current research in physics of the solid state and of other condensed matter. (S/U grades only.) (F,W,S)

**251. High-Energy Physics Seminar (0-1)**

Discussions of current research in nuclear physics, principally in the field of elementary particles. (S/U grades only.) (F,W,S)

**252. Plasma Physics Seminar (0-1)**

Discussions of recent research in plasma physics. (S/U grades only.) (F,W,S)

**253. Astrophysics and Space Physics Seminar (0-1)**

Discussions of recent research in astrophysics and space physics. (S/U grades only.) (F,W,S)

**254. Atomic and Molecular Physics Seminar (0-1)**

Discussions of current research in atomic and molecular structures and collisions. (S/U grades only.) (Not offered in 1987-88.) (F,W,S)

**255. Theoretical Solid-State Seminar (0-1)**

Discussions of current research in theoretical solid-state physics. (S/U grades only.) (F,W,S)

**256. Biophysics Special Topics Seminar (0-1)**

Discussions of current research in experimental solid state physics and biophysics. (S/U grades only.) (F,W,S)

**257. High-Energy Physics Special Topics Seminar (0-1)**

Discussions of current research in high-energy physics. (S/U grades only.) (F,W,S)

**258 Astrophysics and Space Physics Special Topics Seminar (0-1)**

Discussions of current research in astrophysics and space physics. (S/U grades only.) (F,W,S)

**259. Biophysics Seminar (0-1)**

Discussions of current research in biophysics. (S/U grades only.) (F,W,S)

**260. Physics Colloquium (0-1)**

Discussions of recent research in physics directed to the entire physics community. (S/U grades only.) (F,W,S)

**285. Seminar in National Security for Science Students (4)**

The course will consist of two parts: first, a presentation of what our national security policy is, and second, a discussion of how various current science and technology programs and policies relate to it. (S/U grades permitted.) (W)

**297. Special Studies in Physics (1-4)**

Studies of special topics in physics under the direction of a faculty member. *Prerequisites: consent of instructor and departmental chairman* (S/U grades permitted.) (F,W,S)

**298. Directed Study in Physics (1-12)**

Research studies under the direction of a faculty member. (S/U grades permitted.) (F,W,S)

**299. Thesis Research in Physics (1-12)**

Directed research on dissertation topic. (S/U grades permitted.) (F,W,S)

**500. Physics Instruction (1-4)**

Credit may be obtained for participation in undergraduate teaching as follows: one unit is equivalent to (a) two one-hour recitation sessions without grading; (b) one one-hour recitation session with grading; (c) one two-hour problem section; or (d) one three-hour laboratory section. Weekly meeting with instructor is required. (F,W,S)

**PHYSIOLOGY AND PHARMACOLOGY**

OFFICE: 1048 Basic Science Building,  
School of Medicine

**Professors:**

- Roland C. Blantz, M.D. (*Medicine*)
- Colin M. Bloor, M.D. (*Pathology*)
- Robert A. Brace, Ph.D. (*Reproductive Medicine*)
- James W. Covell, M.D. (*Medicine and Bioengineering*)
- Darrell D. Fanestil, M.D. (*Medicine*)
- Morris E. Friedkin, Ph.D. (*Biology*)
- Theodore Friedmann, M.D. (*Pediatrics*)
- Gordon N. Gill, M.D. (*Medicine*)
- Mehran Goulian, M.D. (*Medicine*)
- Phillip Groves, Ph.D. (*Psychiatry*)
- A. F. Hofmann, M.D., Ph.D. (*Medicine*)

Aaron J. Hsueh, Ph.D. (*Reproductive Medicine*)

Paul A. Insel, M.D. (*Medicine*)

Martin F. Kagnoff, M.D. (*Medicine*)

Murray D. Mitchell, Ph.D. (*Reproductive Medicine*)

Jerrold M. Olefsky, M.D. (*Medicine*)

Morton P. Printz, Ph.D. (*Medicine*)

Samuel I. Rapaport, M.D. (*Medicine*)

Michael G. Rosenfeld, M.D. (*Medicine*)

Jerry A. Schneider, M.D. (*Pediatrics*)

David S. Segal, Ph.D. (*Psychiatry*)

Daniel Steinberg, M.D., Ph.D. (*Medicine*)

Palmer W. Taylor, Ph.D. (*Medicine*)

Wylie W. Vale, Ph.D. (*Medicine-Adjunct*)

Peter D. Wagner, M.D. (*Medicine*)

John F. Ward, Ph.D. (*Radiology*)

Stephen I. Wasserman, M.D. (*Medicine*)

John B. West, M.D., Ph.D. (*Medicine*)

Fred N. White, Ph.D. (*Medicine*)

**Associate Professors:**

Joan Heller Brown, Ph.D. (*Medicine*)

Laurence L. Brunton, Ph.D. (*Medicine*)

Wolfgang H. Dillmann, M.D. (*Medicine*)

Vincent E. Dionne, Ph.D. (*Medicine,*

*Chairman, Group in Physiology and*

*Pharmacology, 1986-88)*

G. F. Erickson, M.D. (*Reproductive*

*Medicine*)

Stephen B. Howell, M.D. (*Medicine*)

Michael Karin, Ph.D. (*Medicine*)

John C. Khoo, Ph.D. (*Medicine*)

Hyam L. Leffert, M.D. (*Medicine*)

Daniel T. O'Connor, M.D. (*Medicine*)

Frank L. Powell, Ph.D. (*Medicine*)

Geert Schmid-Schoenbein, Ph.D.

(*Bioengineering*)

Ben Y. Tseng, Ph.D. (*Medicine*)

**Assistant Professors:**

Christine Baylis, Ph.D. (*Medicine*)

Kim A. Heidenreich, Ph.D. (*Medicine*)

Carol L. Macleod, Ph.D. (*Medicine*)

Odile Mathieu-Costello, Ph.D. (*Medicine*)

Harvey Motulsky, Ph.D. (*Medicine*)

Dipak K. Sarkar, Ph.D. (*Reproductive*

*Medicine*)

Robert H. Tukey, Ph.D. (*Medicine*)

Ajit P. Varki, M.D. (*Medicine*)

**The Graduate Program**

The graduate program offered by the Group in Physiology/Pharmacology is designed to lead to the Ph.D. degree through a combination of didactic study, laboratory rotations, and thesis research in areas represented by the group. Research experiences are wide and varied, permitting students the options of selecting molecular, cellular, or organ system approaches in their research programs. Students are encouraged to design and



## PHYSIOLOGY AND PHARMACOLOGY

execute investigation in a self-critical and independent manner and to develop proficiency as teachers. Undergraduate preparation must include courses in mathematics (through calculus), chemistry (including organic, physical, and biochemistry), and if possible, participation in undergraduate research. Students whose undergraduate backgrounds are significantly different will be considered provided there is sufficient evidence of interest in physiology, pharmacology, or eukaryotic regulatory biology, and a desire to enter a field of active research and academic excellence.

### DOCTORAL DEGREE PROGRAM

During the first two years, the student will take basic courses in physiology, pharmacology, eukaryotic regulatory biology, endocrinology, and the neurosciences. In a required laboratory rotation program, students develop laboratory skills and the ability to formulate scientific hypotheses and become familiar with the research activities of the faculty. Additional elective courses in the second and subsequent years will depend upon the student's interests and the direction of the thesis project, which is to be selected by the end of the second year of graduate study. Tracks of required advanced course work to be taken in the second year will be determined by the student's orientation to physiology, pharmacology, or eukaryotic regulatory biology.

The graduate program is interdepartmental and interdisciplinary; it involves primarily faculty of the Department of Medicine, but also includes faculty from the Departments of Neurosciences, Reproductive Medicine, Biology, Chemistry, Scripps Institution of Oceanography, and the AMES Bioengineering Group. Research fields that are especially strong in the group are pulmonary and cardiovascular physiology and pharmacology. Pharmacologic studies of drug action at the molecular and biochemical levels include studies of receptors (autonomic and peptidergic), genetic methods to analyze hormone-receptor interactions, endogenous hormone systems, and electrophysiological approaches to a definition of neurotransmitter and hormone action. Physiological approaches within the group span wide and diverse areas, including chemoreceptor and comparative physiology, thermoregulation in polar climates, lipid metabolism, and studies of peripheral microcirculation. Studies in cellular physiology and pharmacology within

the group involve several approaches focusing on primary and established mammalian cell lines. As evidence of the research strength of the group, faculty within the program are the directors of three specialized centers of research at the university focusing on myocardial ischemia, hypertension, and atherosclerosis. Other faculty are directors of training grants for programs in pulmonary physiology, cardiovascular physiology, pharmacology, hypertension, metabolic diseases, and molecular biology.

The graduate program in physiology and pharmacology is also designed to educate physician-scientists. The flexibility of this program and of the School of Medicine permits students admitted to both programs to obtain an M.D. and a Ph.D. Students admitted to the School of Medicine are eligible for admission to our program with application. Such students generally apply in the first or second year of their medical studies and enter graduate studies following completion of their second year of medical school. The program requires that the thesis research be completed and the thesis defended successfully prior to commencing the clinical clerkships in the third year of the medical school curriculum. Normative time for M.D./Ph.D. students is seven years. Students admitted to the Ph.D. program who wish to obtain a combined degree should complete their doctoral and thesis studies prior to entering medical school. Applications for admission to medical school prior to completing thesis research are discouraged by the program.

### Examinations

Students obtain letter grades in the program's basic courses. At the end of the second year, candidacy for the Ph.D. degree is determined by a two-part examination. The first part, the minor proposition examination, tests the student's competence and ability to design a pertinent research problem in an area unrelated to his or her major interest. The second part, the major proposition examination, deals with the dissertation problem and should be completed between the spring of the third year and the beginning of the fourth year of residence in the program. After preparing the dissertation, an oral defense of the thesis completes the requirement for the Ph.D. degree.

### Teaching

Teaching experience is an important part of the program. Students direct labo-

ratory exercises and discussion sections of the School of Medicine core courses.

## Courses

### 206. Organ Physiology (9)

Building on the student's basic knowledge of cellular biology and biochemistry, this course develops fundamental concepts of organ physiology. Major areas include autonomic, cardiovascular, gastrointestinal, renal, and respiratory physiology. Clinical correlation sessions relate physiological principles to clinical situations. (The course represents the major time commitment for graduate students in the winter quarter.) *Prerequisites:* *Phys./Pharm. 217, 218, 219 or equivalent background in biology and chemistry. For students not in the School of Medicine consent of instructor. (W)*

### 206L. Organ Physiology and Pharmacology, Laboratory Course (3)

Selected laboratory exercises demonstrating basic principles of pharmacology and organ physiology. Subjects covered include electrocardiography, hemodynamics, myocardial control mechanisms, pulmonary function, dose-response relationships in pharmacology, autonomic mechanisms, and other aspects of physiology and pharmacology. *Prerequisites:* *cell biology and biochemistry or equivalent, and consent of instructor. (W)*

### 212. Advanced Medical Pharmacology and Therapeutics (3)

Three hours of lecture weekly on topics not adequately covered in core courses. Correlation with pathophysiology of diseases will be stressed including organ malfunction as causes of drug toxicity. Other topics will include chemotherapeutic agents, cardiovascular drugs, and anesthetics. (S)

### 217. Cellular and Molecular Physiology and Pharmacology (5)

This course will focus on cell physiology and eukaryotic cells. Selected topics will include: plasma membrane, cell-cell adhesion, principles of nervous system physiology and nerve transmission, ion channels, receptors, and physical biochemistry of macromolecules. (F)

### 218. Principles of Endocrinology, Reproduction, and Metabolism (5)

Selected topics in endocrinology with general principles of hormone action at the molecular, cellular, and organ system level will be covered. Application to an understanding of reproductive mechanisms and relationship of endocrine systems to cellular and organ system level metabolism. (F)

### 219. Molecular Mechanisms in Eukaryotic Regulation (3)

Modern concepts of gene physiology and biology covering all aspects from cell cycle and DNA/RNA synthesis processing and transport through viruses and molecular and cellular mechanisms to regulate gene expression. (F)

### 220A-B. Principles of Pharmacology (3-2)

Building on the student's knowledge in cell biology and biochemistry, this course examines the principles of pharmacology and therapeutics and relates them to clinical practice. The portion of the course given in the winter quarter is closely integrated with the Organ Physiology course. Same prerequisites as 206. (W,S)

### 221. Selected Topics in Cardiovascular Instrumentation (2)

Basic principles of the design and use of modern cardiovascular instrumentation techniques — both laboratory and clinical — are discussed in a series of twelve seminars dealing with different problems in the cardiovascular area. Topics will range from electronic monitoring and display systems, to video and X-ray procedures, to system analysis and outline computational methods. *Prerequisites:* *Phys./Pharm. 206 and 206L and consent of instructor. (S)*

### 223. Inborn Errors of Metabolism (2)

Detailed discussions of the molecular aspects of certain inborn errors of intermediary metabolism selected to illustrate principles of biochemical genetics applicable to a wider variety of clinically important genetic diseases. Individual sessions will include faculty presentations followed by student-led discussions of the particular principles illustrated by the disorders reviewed. (S)

**224. Receptor Mechanisms in the Action of Reproductive Hormones (3)**

This course deals with the cellular and molecular basis for the action of reproductive hormones. Emphasis is placed on the role of hormone receptors and the physiological consequences of receptor-hormone interactions in the female and male reproductive systems. (F)

**225. Physiological Aspects of the Ovary (3)**

This course deals with recent concepts concerning structure-function relationships in the mammalian ovaries. Contents include: History, development, cytology, steroid biosynthesis and function, hormone receptor interactions, oogenesis, folliculogenesis, ovulation, corpus luteum formation/regression, menstrual cycle, menopause, pathophysiology. (W)

**227. Neuroendocrinology (4)**

The course will examine the role of the CNS in controlling reproductive functions, stress, growth, biological rhythm, and behavior. Materials to be covered include: the evolution of neuroendocrine hormones; development and maturation of the neuroendocrine system; neuroendocrine techniques; neuroanatomy; physiological actions of neuropeptides; the nature of aminergic and peptidergic neurotransmission in the brain in modulating the output of hormones of the pituitary; cellular and molecular mechanisms of neuroendocrine function. (S)

**228. Advanced Cardiovascular Physiology (1)**

This course surveys cardiovascular physiology with the emphasis on structure, mechanics, and energetics of cardiac muscle. An introduction to the theoretical basis of the fundamental approach to research problems in cardiovascular physiology is provided. *Prerequisites: Phys./Pharm. 206 and 206L and consent of instructor.* (F,W,S, in even-numbered years.)

**229. Methods in Pharmacology (2)**

This course outlines experimental methods used by modern pharmacologists. Theoretical, technological, and analytical discussions of tissue culture, radioisotopes, pharmacogenetics, electrophysiology, magnetic resonance and fluorescence spectroscopy, radioimmunoassay, protein purification and hydrodynamics, protein conformational analysis, and high pressure liquid chromatography are given. (S)

**230. Neuropharmacology and Receptor Mechanisms (3)**

An examination of the molecular and biochemical bases of drug and neurotransmitter action. The fall-quarter course is devoted to receptor mechanisms, neuropharmacology, and drug action on excitable tissues. *Prerequisite: course in biochemistry.* (F)

**231. Selected Topics in Pharmacology (3)**

Fundamental concepts of modern biochemical and molecular pharmacology are given. Areas covered include ion channels and pumps, membrane energetics, nucleotide cyclases, Na<sup>+</sup>-mediated solute transport, enzymatic protein modification and hepatic drug metabolism, chemical carcinogenesis, lipid modulators, chemotherapy, and receptor/ligand interactions. *Prerequisites: Phys./Pharm. 229, Phys./Pharm. 230, OPP, advanced biochemistry, molec. biology, or consent of instructor.* (W)

**232. Introduction to Computers in Pharmacology (2)**

Brief introduction to basic programming on microcomputers. Course will be limited to six students who will independently develop a moderately complex program with individual help from instructor. Lectures devoted to application of computers to research in pharmacology will be included.

**240. Advanced Physiology (3 per Quarter)**

Courses will cover aspects of advanced cardiovascular, respiratory, renal, and comparative physiology. *Prerequisites: Phys./Pharm. 206 and 206L or School of Medicine 206 and 206L.* (F,W,S)

**241. Neuroreflex Control of Cardiovascular and Respiratory Systems (3)**

Topics covered in this course include experimental techniques, CNS respiratory and cardiovascular mechanisms, reflex modulation of breathing, arterial, visceral and somatic cardiovascular reflexes, pathophysiology, cardiorespiratory interactions, control systems theory. The course emphasizes the experimental basis of our knowledge and general principles applicable to other physiological systems. (S)

**244. Development of Ideas in Physiology and Pharmacology (2)**

Course will cover aspects of the development of ideas in physiology and pharmacology. (W)

**245. Mathematical Methods in Physiology and Pharmacology (3)**

The formulation and solution of differential equations applied to basic time-dependent phenomena commonly encountered in physiological and pharmacological research will be covered. Laplace methods. *Prerequisite: college calculus.* (F)

**262. Neurophysiology (4)**

An overview of neurophysiological systems, emphasizing mammalian neurophysiology and related model vertebrate systems and concepts. (S)

**271. Introduction to Cardiovascular Physiology (3)**

Physical concepts of behavior of heart, large blood vessels, vascular beds in major organs, and microcirculation. Included will be the physical and physiological principles of blood flow, blood pressure, cardiac work, electrophysiology of the heart, descriptions of special vascular beds including their biological and hemodynamic importance. Integration of separate components through nervous and humoral controls will be analyzed. (W)

**285. Statistical Inference in the Medical Sciences (3)**

A first course in statistical procedures for the medical sciences. Topics will be chosen from among paired comparisons, experimental design, quantal design, bioassay, counts, regression and correlation, analysis of variance, survivorship. Some emphasis will be given to computational techniques. *Prerequisite: high school algebra.* (W)

**296. Directed Reading (1-4)**

Reading of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. *Prerequisite: consent of instructor.*

**297. Graduate Seminar (1)**

For first-year graduate students and for medical students: Each week a different faculty member will discuss his or her research in the broad areas of physiology, physiological chemistry, and pharmacology. For advanced graduate students: discussion of current research and pertinent literature on a rotating basis. *Prerequisite: consent of instructor.* (F,W,S)

**298. Directed Study (1-12)**

Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. (F,W,S)

**299. Independent Study or Research (1-12)**

Independent study or research. *Prerequisite: consent of instructor.* (F,W,S)

**POLITICAL SCIENCE**

OFFICE: Building 412, Matthews  
Administrative and Academic Complex

**Professors:**

Wayne A. Cornelius, Ph.D.  
Paul Drake, Ph.D.  
Peter A. Gourevitch, Ph.D.  
\*Clifford Grobstein, Ph.D.  
Peter H. Irons, Ph.D., J.D.  
Gary C. Jacobson, Ph.D.  
Samuel H. Kernell, Ph.D.  
David D. Laitin, Ph.D.  
Sanford A. Lakoff, Ph.D.  
Arend Lijphart, Ph.D.  
\*Roger R. Revelle, Ph.D.  
Peter H. Smith, Ph.D.  
Tracy B. Strong, Ph.D. (Chairman)  
\*Herbert F. York, Ph.D.

**Adjunct Professor:**

Miles Kahler, Ph.D.

**Associate Professors:**

Nathaniel L. Beck, Ph.D.  
Ellen T. Comisso, Ph.D.  
Peter F. Cowhey, Ph.D.  
Gary Cox, Ph.D.  
Ann L. Craig, Ph.D.  
Harry Hirsch, Ph.D.  
Mathew McCubbins, Ph.D.  
Samuel L. Popkin, Ph.D.  
Susan L. Shirk, Ph.D.

**Assistant Professors:**

Steven P. Erie, Ph.D.  
\*Allen G. Greb, Ph.D.  
David R. Mares, Ph.D.

**Adjunct Assistant Professor:**

Lawrence A. Herzog, Ph.D.

**Visiting Faculty:**

Henry Ehrmann, J.D., Ph.D., *Dartmouth College*  
Martin Shapiro, Ph.D., *Boalt Hall Law School, University of California, Berkeley*

\*Affiliated from Program on Science, Technology, and Public Affairs

**The Major Program**

Political science addresses some of the fundamental problems facing human society. Questions concerning world peace, government policies aimed at achieving economic stability and growth, the management of environmental quality, control over educational policy, the possibility of using law to affect social change, and the gap between the rich and poor states are all on the research agenda of contemporary political scientists. The general purpose of the major is to address these and other issues systematically, and, in doing so, to raise the broad theoretical questions which can help students relate today's political debates to those debates about politics which have kept a theoretical tradition alive for over 2,000 years.

Majors are required to take the full introductory sequence made up of 10, 11 and 12, and any twelve upper-division courses. The Revelle Social Science Sequence which consists of 10A, 10B, and 10C may be substituted for 10, 11, and 12. Transfer students must take at least one of these lower-division courses in residence at UCSD. Courses taken elsewhere will not be credited toward the major requirement unless approved by the department on the basis of individual petition. The department also requires that all students declaring the political science major as of fall 1986 take Social Science 60 (Elementary

## POLITICAL SCIENCE

tary Statistics for the Social Sciences). This course should preferably be taken by the second quarter of the student's junior year. Students may substitute either Political Science 170A or Economics 120A for this requirement, or petition for an equivalency. Joint majors may, under certain circumstances, be exempted from the statistics requirement; they should contact the undergraduate adviser. As of fall quarter 1982, students must attain a grade of C for any course to be counted toward the completion of the major. Candidates for departmental honors are required to take 191A and B, courses which lead to the writing of a senior thesis. (A 3.5 GPA in the major is a prerequisite for honors.) These courses may be counted toward the upper-division requirement. All political science majors are strongly urged to take at least one quarter of the 110A, 110B, 110C sequence and 170A. The variety of "areas of concentration" within the upper-division curriculum are meant for self-guidance, as outside of the lower-division sequence there are no breadth requirements. *After a student declares political science as his or her major, he or she is strongly encouraged to see the undergraduate adviser for a general discussion of his or her overall program.*

**Since course offerings may change from year to year, students are strongly advised to consult the department for the latest listing of courses before preregistration.**

## CAREER GUIDANCE

Many political science majors at UCSD will seek admission to a *law school*. Although law schools make no recommendation concerning the usefulness of any undergraduate major, a B.A. in political science should be seen as a useful complement to a law degree. Students who take courses in American government, policy analysis, and law and politics find that they develop a keen understanding of the role of law in the general political process. This helps students understand the limits and possibilities of the legal process in fostering change or in preserving the status quo. This same curriculum provides a solid foundation for a career in *journalism*. If students have any specific questions regarding law, we advise them to come into the Department of Political Science and consult with the law adviser.

Increasingly, political science majors are preparing for careers in *business* or as *policy analysts* in both the public and private sectors. Many of these students go

for advanced degrees in public policy or study for a master's in business administration. Students interested in this option should look into policy analysis as an area of concentration. Some political science majors are interested in careers in international organization or *diplomacy*. These students should look into international relations as an area of concentration. In addition, a broad array of courses in comparative politics is essential for anyone interested in a career of international service. The premise of our educational philosophy is that the best professional preparation for productive careers which we can provide is one which is broad, theoretical, and only indirectly related to the current job market.

## AREAS OF CONCENTRATION

The Department of Political Science offers nine different areas of concentration. These areas are distinguished for purposes of career guidance. At this time, the Department of Political Science does not require, but encourages, students to expose themselves to courses in the different areas of concentration.

### American Politics

Courses focusing on American institutions and processes, as well as constitutional law and urban politics are listed in this area. P.S. 10 is the foundation course. Students with a special interest in American politics are encouraged to take courses in American history (Hist. 152-169 encompasses a broad array of relevant courses) and economics (any introductory sequence). See the course listings for prerequisites and sequencing.

### Political Theory

P.S. 110A, 110B, and 110C provide the foundation for a concentration in political theory, and should precede the more advanced courses. Students of political theory are encouraged to examine the offerings in the Department of Philosophy (recommended are Phil. 101-107, 120, and 166).

### Comparative Politics

P.S. 11 is a fundamental foundation course for the concentration in comparative politics. For upper-division courses, students are encouraged to mix theoretically informed courses with courses focusing on specific geographic areas. Students should consider enrolling in history and foreign language courses in conjunction with their area interests in political sci-

ence. Courses in anthropology (for example, Anthro. 23, 151, 163) and sociology (for example, Sociol. 124 and 139) often complement a comparative politics area of concentration, and the introductory sequence in economics is useful.

## International Relations

P.S. 12 is the foundation course for an international relations area of concentration. Students of international relations should consider studying American diplomatic history (Hist. 169A-B), European diplomatic history (Hist. 113), and international economics (Econ. 101, 103). Students who wish to go on to a diplomatic career should become fluent in at least one foreign language.

## Policy Analysis

The concentration in public policy is designed to serve the needs of students who will be pursuing graduate work in public policy (either in a law school or in a school of public policy) as well as those who will seek employment immediately after the B.A. The program is designed to give students an understanding of what it means to do policy analysis as well as provide tools that will enable them to become practitioners. Project oriented work is stressed.

The concentration requires only a few "skill" courses. However, the more skills a policy analyst has, the better are his or her chances of finding employment. Thus students would be well advised to take as many economics, computer science, mathematics, and statistics courses as possible. Those going on to graduate school will have more opportunities to pick up these skills during future training. Econ. 100A-B, 120A-B-C, CSE 65 and 69, Phil. 10, 11, and 110, 111 and any mathematics course would help provide useful skills.

Most policy analysts work for some governmental agency. While many policy analyst positions require a master's degree, it is possible to work with only a bachelor's degree. However, B.A. holders without quantitative skills will find themselves at a disadvantage in the job market.

Students who wish to concentrate in policy analysis may petition to the undergraduate adviser to allow two courses given by the Department of Economics, the Science, Technology and Public Affairs Program (STPA), or the Urban Studies and Planning Program (USP) to substitute for two upper-division courses in political science.

In order to get this waiver, the students must have taken one course in microeconomics (e.g., Econ. 1B), and have taken the following courses in the Department of Political Science: 160AA, 160AB, and 160B.

A policy analysis concentration lends itself well to the kind of field experience provided by the Warren College Internships and by the Honors Thesis Program in the Department of Political Science (P.S. 191A-B). Students should speak to an adviser about these opportunities.

### Political Economy

Political economy encompasses two sets of courses culled from virtually all the other areas of concentration. The first set of courses concerns the interrelationship between the political and economic orders. Courses here include 144AA-AB, 144B, 102B, 126AA-AB, 138A, and 138B. The second set of courses concerns the use of the methodology associated with economic analysis in order to address political questions. Courses here include 100DA-DB and 110A. Students who wish to specialize in political economy should seek consultation from the undergraduate adviser.

### Communication and Politics

The Department of Political Science has a variety of courses cross-listed with the Department of Communication. They include 100DA-DB, 102DA-DB, 102F, 102I, 112B, 112C, 112D, 124A, 136B, 138E, 170A, and 170CA-CB. Students may make communication an area of concentration within the political science major (in which case the students may substitute two communication courses for two of the upper-division political science courses), or they can major in both communication and political science.

### Latin American Politics

As a field of concentration, Latin American politics is built around courses in comparative politics and international relations. P.S. 11 and 12 provide the foundations for upper-division course work. Upper-division courses are of two types: specific country studies and topical courses. On specific countries, students can choose among: 134AA-AB, 134B, 146BA-BB, 134G, and 134I. Topical courses include among others 134C, 134D, 138B, 142A, 146A, 146C, and 146D. Students should check current course offerings to update this list.

Students should include in their curriculum courses drawn from the general fields

of international relations and comparative politics which are not focused on Latin America. Among those which could be considered in this category are 120A, 127A, 136B, 146AA-AB.

Students should also consider taking courses in linguistics, literature, sociology, or history which complement the department's emphasis on political economy. This interdisciplinary exposure is particularly important for students planning careers in journalism, business, or international civil service. Check with a faculty adviser about appropriate regional, general, and interdisciplinary courses for this field of concentration.

### U.S.-Mexican Studies

This area of concentration enables students to develop special expertise on Mexico and U.S.-Mexican political and economic relations, in preparation for graduate work in one of the social sciences or humanities, or for nonacademic careers in medicine, law, business, or public service (including international organizations). There is a strong demand in all of these fields for personnel having the substantive knowledge, the research skills, and the binational cultural sensitivity needed to work successfully on both sides of the border.

Those contemplating careers in this field should develop a broadly based, interdisciplinary perspective on Mexico and major problems affecting U.S.-Mexican relations. In addition to the political science courses listed below, students should have at least one course in Mexican culture (examples are Lit/Sp 135, and Music 111, when it includes a unit on Mexican music). A good reading and speaking knowledge of Spanish is essential for employment in the field and for P.S. 196. Students should begin (or refresh) their Spanish language training as early as possible. For those who have not had the language previously, the "Maxi Program" in Spanish is recommended (see catalog description under Language/Mini and Maxi Programs for language study).

Within political science, the three core courses in the area of concentration in U.S.-Mexican Studies are P.S. 134C, 146B, and 196. This is the recommended sequence for the core courses, although P.S. 146B may be taken before P.S. 134C if necessary. Other political science courses in this area of concentration are: P.S. 150A, 134D, and 138B. Political Science 134AA-AB is particularly recommended as background for P.S. 134C, if students have had no previous course work on

Latin American political processes and institutions.

This area of concentration enables students to take full advantage of the Department of Political Science's Center for United States-Mexican Studies, including seminar presentations by the center's distinguished visiting research fellows from Mexico and other institutions in the United States in P.S. 146B. Students taking P.S. 196 will participate in major field studies being conducted by the staff of the Center for U.S.-Mexican Studies. They can also compete for Undergraduate Field Research Grants in U.S.-Mexican Studies, awarded each year to qualified students wishing to do independent research projects in Mexico or among Mexican populations in the United States, normally in preparation to write a senior honors thesis. Fluent Spanish is a prerequisite for these grants. For further information, contact the Research Director, Center for U.S.-Mexican Studies.

The courses listed for this area of concentration within the political science major also meet the requirements for the Warren College program of concentration (minor) in Mexican studies, although no more than two political science courses (chosen from 134AA-AB, 134C, 134D, 146B, 150A, and 196) can be applied to the Warren College minor.

### Minor in Political Science

Students wishing to minor in political science are advised to take the introductory sequence and three upper-division courses, but students may choose to substitute upper-division courses for any of the three lower-division offerings.

### Interdisciplinary Minors

The Department of Political Science takes part in two interdisciplinary minors offered at UCSD. The law and society minor offers students the opportunity to examine the role of the legal system in society. Students should note that Law and Society 101 (Contemporary Legal Issues) may, under certain circumstances, be used in fulfilling the twelve upper-division course requirement for the political science major. The minor in health care — social issues offers students a variety of perspectives that will enhance their ability to deal with complex social and ethical issues in modern health care. Additional information on these programs is available through the Warren Interdisciplinary Programs Office.



### Special Minor in Policy Analysis for Scientists and Premeds

Many natural scientists and doctors find themselves getting involved in questions of public policy. Unfortunately, they have not been prepared by their training to consider the political aspects of such problems. This minor is designed to give premedical students and students in the natural sciences an introduction to public policy. While the minor does not require any lower-division courses, P.S. 10 is a prerequisite for several of the courses in the minor, and is highly recommended.

The minor consists of P.S. 160AA-AB and 160B and three other upper-division courses listed in the policy analysis area of concentration and the section of courses under "research methods." This listing is intended to be suggestive, not exhaustive. Relevant courses from other departments and programs such as Science, Technology, and Public Affairs or the Department of Economics (courses in the 130 series) may be substituted for one of the three other courses. Students taking this minor should consult with the public policy faculty in the Department of Political Science.

### Center for United States-Mexican Studies

OFFICE: Institute of the Americas Building

Wayne A. Cornelius, Ph.D., Director

Opened in September, 1980, the Center for U.S.-Mexican Studies has the nation's largest program of advanced research, training, and public service activities devoted exclusively to Mexico and U.S.-Mexican relations. More than fifty researchers — representing the disciplines of anthropology, demography, economics, geography, history, law, marine sciences, medicine, political science, sociology, urban studies and planning — are affiliated with the center each year. About half of these research associates are based at Mexican universities.

Research projects conducted under the auspices of the center deal with the full range of issues affecting relations between Mexico and the United States, as well as Mexico's own history and contemporary development problems. The center's research associates also examine

those aspects of the U.S. economy and society which are affected by interactions with Mexico (for example, U.S. labor markets that have large concentrations of Mexican immigrant workers).

The center serves as an integrating mechanism and informational clearing-house for research undertaken at many different sites in the United States and Mexico. The center's interdisciplinary Research Seminar on U.S.-Mexican Relations and Mexican Development Issues attracts leading researchers from both countries who present new findings and research proposals each week to a group of twenty-five to forty Mexican specialists affiliated with the center.

Several two-day workshops focusing on specific research areas, in which the center's resident research fellows and researchers based at other institutions participate, are held each year. The center also publishes, twice yearly, an *International Inventory of Current Mexico-Related Research*, containing abstracts of research projects being conducted throughout the United States and Mexico, in all disciplines.

In addition to sponsoring or facilitating the work of individual scholars and development practitioners, the center operates its own field research unit which conducts a variety of studies dealing with Mexican migration to the United States. Ongoing projects conducted by the field research unit include a major study of economic participation, cultural integration, and health service utilization among Mexican immigrants and their children who live in the San Diego region, and a study of the utilization of Mexican labor by employers in San Diego, Los Angeles, and the San Francisco Bay area.

Information generated by the center's research personnel is disseminated to a large, international body of scholars, journalists, public officials, business executives, labor leaders and legal experts, as well as to research libraries and community service organizations. Much of the research is published in the center's own *Research Report Series* (nearly forty-two titles published through 1984) and its *Monograph Series* (fifteen published through 1984).

### The Ph.D. Program

The doctoral program offers instruction in the four main fields of the discipline: American politics, comparative politics, international relations, and political theory. In addition, the department offers special

programs in Latin America (with emphasis on Mexico), political economy (including public choice theory), science and public policy, and quantitative analysis. Students take a set of core seminars in at least two of the main fields, a three-quarter sequence in political data analysis and research design, a three-quarter sequence in political theory (210A-B-C), and submit a research paper due at the end of the winter quarter of the second year of residence. Before writing a dissertation, students must take at least eighteen courses (at least one course in each of the fields in political science and two courses in other disciplines — one of which should be at the graduate level), demonstrate reading knowledge in a foreign language, and pass comprehensive examinations in two major fields. Students must also satisfy a six-quarter teaching requirement.

## Courses

### Lower Division

#### 10. Introduction to Political Science: American Politics (4)

This course surveys the processes and institutions of American politics. Among the topics discussed are individual political attitudes and values, political participation, voting, parties, interest groups, Congress, presidency, Supreme Court, the federal bureaucracy and domestic and foreign policy making.

#### 11. Introduction to Political Science: Comparative Politics (4)

The nature of political authority, the experience of a social revolution, and the achievement of an economic transformation will be explored in the context of politics and government in a number of different countries.

#### 11W. Writing in Comparative Politics (2)

This course, to be taken in conjunction with Political Science 11, is designed to provide tutorial help for students wishing to improve their writing skills in the political science discipline. (W)

#### 12. Introduction to Political Science: International Relations (4)

The issues of war/peace, nationalism/internationalism, and economic growth/redistribution will be examined in both historical and theoretical perspectives.

#### 12W. Writing in International Relations (2)

This course, to be taken in conjunction with Political Science 12, is designed to provide tutorial help for students wishing to improve their writing skills in the political science discipline. (S)

#### 14. Politics and the Third World Poor (4)

(Same as Third World Studies 14.) This course explores the context, structure, purpose, and fate of collective political action by the urban and rural poor in Latin America, Asia, and Africa. It examines local as well as national political organizations and their economic, social, and cultural foundations.

#### 15. Minorities and Politics (4)

(Same as Third World Studies 15.) This course analyzes the political and economic problems facing minority groups in the United States, in particular, blacks, Hispanics, and women. Topics to be explored include the changing relationship between race, ethnicity, gender and class; the dilemmas of minority group political organization, leadership and interest, representation; the role of the state in defining minority status and in shaping the political behavior of minorities; and the applicability for today's minorities of the political strategies used by European immigrant groups such as the Irish, Italians, and Jews.



**20. Knowledge and Society: the Problem of Nuclear War (4)**

(Same as STPA 20.) The aim of this course is to investigate the problems posed by nuclear weapons in terms of the interaction of different forms of knowledge — scientific, technological, political, and ethical. Topics will include the military use of scientific knowledge, the analysis of international conflict and strategy, and diplomatic efforts to control the nuclear arms race.

**27. Ethics and Society (4)**

(Same as Phil. 27.) An inquiry into the principles of ethical conduct and their applications. The course examines some of the major theories (including natural law, individual rights, utilitarianism) and the general issue of rights and obligations with respect to adherence to law (as in civil disobedience, abortion, and the refusal to obey an unjust law or order). Case studies will be employed to consider the relevance of these principles to various occupations such as business, engineering, law, and government, in order to enable students to anticipate some of the difficulties that will arise for them in real-life situations whenever hard moral choices must be made. Satisfies the Warren College ethics and society requirement. This course is required for all Warren students entering the college fall 1985 and thereafter.

**40. Introduction to Law and Society (4)**

This course is designed as a broad introduction to the study of law as a social institution and its relations to other institutions in society. The focus will be less on the substance of law (legal doctrine and judicial opinions) than on the process of law — how legal rules both reflect and shape basic social values and their relation to social, political, and economic conflicts within society.

**Upper Division**

**Minimum requirement for all upper-division courses is at least one quarter of lower-division political science, or upper-division standing.**

**AMERICAN POLITICS****100A. The Presidency (4)**

(Formerly P.S. 109) The role of the presidency in American politics. Topics will include nomination and election politics, relations with Congress, party leadership, presidential control of the bureaucracy, international political role and presidential psychology. *Prerequisite: upper-division standing or consent of instructor.*

**100B. The U.S. Congress (4)**

(Formerly P.S. 121) This course will examine the nomination and election of congressmen, constituent relationships, the development of the institution, formal and informal structures, leadership, comparisons of House with Senate, lobbying, and relationship with the executive branch. *Prerequisite: P.S. 10.*

**100C. American Political Parties (4)**

This course examines the development of the two major parties from 1789 to the present. Considers the nature of party coalitions, the role of leaders, activists, organizers, and voters, and the performance of parties in government.

**100DA. Voting, Campaigning, and Elections (4)**

(Formerly P.S. 107A) (Same as Comm/SF 168A.) This course will consider the nature of public opinion and voting in American government. Studies of voting behavior will be examined from the viewpoints of both citizens and candidates, and an effort will be made to develop models of their electoral behavior. Attention will also be devoted to recent efforts to develop rational choice theories of electoral behavior and to critiques of elections as democratic institutions. The role of the mass media and money also will be examined.

**100E. Interest Group Politics (4)**

The theory and practice of interest group politics in the United States. Theories of pluralism and collective action, the behavior and influence of lobbies, the role of political action committees, and other important aspects of group action in politics are examined. *Prerequisite: P.S. 10 or consent of instructor.*

**102B. Politics of American Economic Policy (4)**

(Formerly P.S. 176) The impact of politics on American post-war economic policy making. Causes and solutions to Ameri-

ca's current economic problems — such as the decline of the automobile industry, double-digit inflation, reindustrialization, and unemployment. Evaluation of the political dimensions of policy making in the Reagan and earlier administrations. Consideration of Marxian, liberal, and other interpretations of policy outcomes will be discussed.

**102C. American Political Development (4)**

(Formerly P.S. 122) American political development will be examined from both a comparative and theoretical perspective with special attention given to the interplay of societal and political change. The modernization of Congress, political parties. The bureaucracy, the federal system, and the judiciary will be examined. *Prerequisites: P.S. 10 and 11.*

**102DA-DB. Public Opinion and Political Ideology (4-4)**

(Same as Comm/SF 124A and Comm/SF 124B.) This course will focus on the structure, origins, and dynamics of public opinion and political ideology. P.S. 102DA considers the nature of public opinion and the factors that shape the development of political ideas — economic interests, psychological functions, political communication and organization, etc. P.S. 102DB examines the development of political ideas in specific historical situations. *Prerequisite: 102DA for 102DB, or consent of instructor.*

**102E. Urban Politics (4)**

This survey course focuses upon the following six topics: the evolution of urban politics since the mid-nineteenth century; the urban fiscal crisis; federal/urban relationships; the "new" ethnic politics; urban power structure and leadership; and selected contemporary policy issues such as downtown redevelopment, poverty, and race.

**102G. Seminar — Special Topics in American Politics (4)**

(Formerly P.S. 163) An undergraduate seminar designed to give students who have already had some course experience in upper-division American politics classes an opportunity to study some aspect of current American politics in greater depth in a small group setting. *Prerequisites: P.S. 10 and one upper-division class in American politics.*

**102H. Political and Legal Foundations of the American Economy (4)**

An examination of the political and legal arrangements necessary for the working of the modern American economy. Particular attention is given to the development of rules about private property, starting with English common law and the Constitution; insights from the "law and economics" fields are also considered. *Prerequisite: a prior course in political economy, and a prior course in law is recommended.*

**102I. The American News Media (4)**

(Same as Comm/Cul 173 and Sociol. 165.) History, politics, social organization, and ideology of the American news media. Special attention will be paid to: historical origins of journalism as a profession and "objective reporting" as ideology; empirical studies of print and TV journalism as social institutions; news coverage of Vietnam and its implications for theories of the news media. *Prerequisite: upper-division standing or consent of instructor.*

**102J. Advanced Topics in Urban Politics (4)**

In this seminar students will do original research on selected topics in urban politics. Special attention will be paid to patterns of urbanization and class, the methods by which political leaders mobilize power, and the economic impacts of such urban political structures as the party machine and federal social programs.

**103A. California Government and Politics (4)**

(Formerly P.S. 111) This survey course explores six topics: 1) the state's political history; 2) campaigning, the mass media, and elections; 3) actors and institutions in the making of state policy; 4) local government; 5) contemporary policy issues; e.g., Proposition 13, school desegregation, crime, housing and land use, transportation, water; 6) California's role in national politics.

**104A. The Supreme Court and the Constitution (4)**

An introduction to the study of the Supreme Court and constitutional doctrine. Topics will include the nature of judicial review, federalism, race, and equal protection. The relation of judicial and legislative power will also be examined.

**104B. Civil Liberties — Fundamental Rights (4)**

This course will examine issues of civil liberties from both legal and political perspectives. Topics will include the First Amendment rights of speech, press, assembly, and religion; other "fundamental" rights, such as the right to privacy; and

some issues in equal protection. Conflicts between governmental powers and individual rights will be examined.

**104C. Civil Liberties — The Rights of Criminals and Minorities (4)**

This course will examine the legal and constitutional issues surrounding the rights of criminal suspects, including Fourth and Fifth Amendment rights, as well as the rights of "marginal" groups, such as aliens and the mentally ill. *Prerequisite: P.S. 104A or consent of instructor.*

**104F. Seminar in Constitutional Law (4)**

This seminar will provide an intensive examination of a major issue in constitutional law, with topics varying from year to year. Recent topics have included equal protection law and the rights of civilians in wartime. Students will be required to do legal research on a topic, write a legal brief, and argue a case to the seminar. Junior or senior standing required, as is consent of the instructor.

**104I. Law and Politics — Courts and Political Controversy (4)**

This course will examine the role of the courts in dealing with issues of great political controversy, with attention to the rights of speech and assembly during wartime, questions of internal security, and the expression of controversial views on race and religion. The conflict between opposing Supreme Court doctrines on these issues will be explored in the context of the case studies drawn from different historical periods.

**105A. Comparative Legal Cultures (4)**

A systematic and comparative treatment of the role of courts in various national settings. The impact of the judicial system on the interplay between the legal and political cultures of Western democratic societies, of communist and some developing countries will be examined.

**106A. Politics and Bureaucracy (4)**

This course explores the problematic relationship between politics and bureaucracy. The theoretical perspectives of Weber, the Marxists, and the pluralists will be employed to understand the character of American bureaucratic development in the twentieth century. *Prerequisite: P.S. 100A or 100B strongly recommended.*

**POLITICAL THEORY****110A. Systems of Political Thought (4)**

(Formerly P.S. 100A) This course focuses on the development of politics and political thought in ancient Greece, its evolution through Rome and the rise of Christianity. Readings from Plato, Aristotle, and Machiavelli.

**110B. Systems of Political Thought (4)**

(Formerly P.S. 100B) The course deals with the period which marks the rise and triumph of the modern political person and the modern political state. Central topics include the relation of authority and community, political myth, and the gradual emergence of individuals capable of being their own (political) masters. Readings from Machiavelli, Shakespeare, Calvin, Hobbes, Locke, Diderot, and Rousseau. *Prerequisite: P.S. 110A recommended.*

**110C. Systems of Political Thought (4)**

(Formerly P.S. 100C) The course deals with the period which marks the triumph and critique of the modern state. Central topics include the development of the idea of class, of the irrational, of the unconscious, and of rationalized authority as they affect politics. Readings drawn from Rousseau, Kant, Hegel, Marx, Nietzsche. *Prerequisite: P.S. 110B recommended.*

**110DA. Contemporary Political Thought (4)**

(Formerly P.S. 102A) The intention of this course is to address certain problems which are characteristic of the political experience of the twentieth century. Among the topics considered are revolution, the availability of tradition, and the problems of the rationalization of social and political relations. Readings from Nietzsche, Weber, Freud, Lenin, Gramsci, Dewey, Oakeshott, Arendt, Merleau-Ponty. The course will be topically rather than personality oriented. *Prerequisites: sophomore standing, two courses in philosophy, or political or social theory.*

**110DB. Contemporary Political Thought (4)**

(Formerly P.S. 102B) This course is a continuation of Political Science 110DA. It will focus on a limited number of individuals in terms of the themes developed during the previous quarter. It will lead to the writing of a research paper. *Prereq-*

## POLITICAL SCIENCE

quisites: sophomore standing, two courses in philosophy, or political or social theory, and P.S. 110DA.

### 110EA. American Political Thought (4)

The first quarter examines the origins and development of American political thought from the revolutionary period to the end of the nineteenth century with special emphasis on the formative role of eighteenth-century liberalism and the tensions between "progressive" and "conservative" wings of the liberal consensus. Some attention will be paid to challenges to the consensus from antebellum southern thinkers and from socialists and anarchists in later periods. Close attention will be paid to the analyses of Tocqueville and Hartz.

### 110EB. American Political Thought (4)

The second quarter examines some of the major themes of American political thought in the twentieth century including controversies over the meaning of democracy, equality, and distributive justice, the nature of "neoconservatism," and America's role as a world power. Students will be encouraged to pursue topics of particular interest, including the effort to identify and protect the rights of minorities and women, arguments over social welfare and economic policy, and questions of foreign policy in which normative beliefs are at issue.

### 110J. Power in American Society (4)

(Same as Sociol. 147 and History 123.) This course examines the ways in which power has been conceived and contested by elites and non-elites, during the course of American history. Through the writings, speeches and biographies of contestants in these struggles, the course explores the changes which have occurred in political rhetoric and strategies as America has moved from a relatively isolated agrarian and commercial republic to a military and industrial empire. Topics will include: the struggle over the Constitution, antebellum reform, agrarian and labor radicalism after the Civil War, the rise of socialist and communist parties after World War I, and the multifaceted protest movements of the 60s and 70s. The course ends by considering the present in light of its continuities and discontinuities with the above traditions.

### 112A. Economic Theories of Political Behavior (4)

(Formerly P.S. 172) An introduction to theories of political behavior developed with the assumptions and methods of economics. General emphasis will be upon theories linking individual behavior to institutional patterns. Specific topics to be covered will include collective action, leadership, voting, and bargaining.

### 112B. Politics, Philosophy, and Social Science Methodology (4)

(Formerly P.S. 137) (Same as Comm/SF 137.) An introduction to philosophy and the political implications of social science. Topics considered will include the nature of theory and evidence, the formulation of research questions, special problems in the study of human behavior or action and the relation between social science and public policy, events, and ideologies. Prerequisite: upper-division standing or consent of instructor.

### 112C. Political Theory and Artistic Vision (4)

(Formerly P.S. 138) (Same as Comm/SF 125.) The course explores the modes of political thinking found in arts, especially in drama and literature. It focuses on particular topics (e.g., ends and means, political leadership, political economy). Readings from a variety of sources and traditions; wherever possible, entire works will be read. Some attempt will be made to develop implications inherent in art for the writing of political theory as a genre. Authors include Shakespeare, Brecht, Flaubert, Conrad, Malraux, with the precise list changing from year to year.

## COMPARATIVE POLITICS

### 120C. Politics in France (4)

The modernization of an old country with strong traditions will be studied at various levels: the consequences of social and economic change for the political culture; institutional development under a semipresidential system and their impact on policy making and on political and administrative personnel; parties and elections; novel relations between center and periphery; objectives and constraints of the "socialist experiment"; perspectives for the country's political economy.

### 120D. Politics in West Germany (4)

An analysis of the Federal Republic of Germany with an emphasis on the party system and executive-legislation relations. Comparisons will be made with other West European democracies, the Weimar Republic, and East Germany.

### 120F. Government and Politics in Spain (4)

This course will analyse the role of Spain in the world political economy from the sixteenth century, the consolidation of the state, the continued development and control under Franco, and the emergence of democracy since 1975. Students who have gone to Spain or plan to do so in the Education Abroad Program are especially encouraged to enroll. Prerequisite: upper-division standing.

### 120FW. Writing in Spanish Politics

This course will involve readings complementary with those in P.S. 120F, but in Spanish. Students will be exposed to the writings of Spanish political scientists writing about Spain, and to contemporary analysis of Spanish politics in the Spanish press. Weekly discussions will be held in Spanish. Prerequisite: enrollment in P.S. 120F and competence in Spanish.

### 122AA. Political Development of Europe: Origins of Dictatorship and Democracy (4)

Investigation of different paths of European political development through consideration of the conflicts which shaped these political systems (the commercialization of agriculture, religion and the role of the church, the army and the state bureaucracy, and industrialization). Stress on alternative paradigms and on theorists, particularly Marx and Weber. Emphasis on Britain and Germany.

### 122AB. The Politics of Revolutions (4)

An examination of the causes, development, and consequences of major revolutions. Particular emphasis on the French Revolution and the 1848 period, with some consideration of Russia, China, Mexico, and Iran. Investigation of different theories of revolution, and of the absence of revolution, in countries such as Britain, Germany, and Sweden.

### 122AC. The Politics of Fascism (4)

An examination of differing interpretations of fascism: its origins, its pattern of rule, and its consequences, and the possibilities of its recurrence today. Special emphasis on pre-WW II Germany and Italy, with some consideration of Spain, Japan, and other cases both from the period between the two world wars, and post-1945.

### 123. Business, Labor, and the State (4)

What has been the role relationship between state and society: nightwatchman, guardian, something else? This course examines the different patterns of society-state relationships (liberal, corporatistic, social democratic, etc.) which have emerged in Western Europe and North America through examination of the strategies which labor movements and business formations have developed in relation to each other, in seeking assistance from the state, and conversely, the role of the state in shaping the behavior of each group. Emphasis on Western Europe, with some comparisons to the U.S. and Japan.

### 124A. Political Consequences of Electoral Systems (4)

(Formerly P.S. 164) A comparative survey of the major dimensions of the electoral arrangements used in contemporary democratic states, the electoral formula (majority and plurality systems, the various forms of proportional representation, and semi-proportional systems), district size, and electoral thresholds. The effects of the different electoral systems on party competition will be analyzed in terms of the relationships between votes and seats, the fragmentation or concentration of party systems, and the encouragement of electoral alliances. Prerequisite: upper-division standing or consent of instructor.

### 126AA. Fundamentals of Political Economy (4)

(Formerly P.S. 175A) The first half of the two-quarter course will focus broadly on how economic behavior affects political action and institutions, and how political action and institutions affect economic behavior. Central consideration will be given to the impact of democratic political systems on various types of economic arrangements and vice versa.

### 126AB. Issues in Political Economy (4)

(Formerly P.S. 175B) The second half of this two-quarter course will deal in depth with one or a number of specific issues touched on in the first half of the course (126AA) and dealt within the framework developed there. Issues may cover such topics as labor and politics, corporatism, politics and economics of bureaucratic organizations, the welfare state, equality and other such questions. Prerequisite: P.S. 126AA.

### 127A. Seminar in Political Economy (4)

A seminar dealing in depth with one or two issues in compar-

ative political economy. The specific topics vary from year to year, and may cover labor and politics, corporatism and the modern economy, economic development and state formation, comparative industrial policy, the welfare state, and equality or other such questions.

### 128A. Democracy in European Plural Societies (4)

This course examines the problem of creating and maintaining stable democratic regimes in countries divided by major cleavages such as those of language and religion. The theory of consociational democracy will be analyzed and applied to the cases of Switzerland, Belgium, the Netherlands, and Northern Ireland. Prerequisite: upper-division standing or consent of instructor.

### 130AA. Soviet Politics (4)

(Formerly P.S. 141A) This course will examine the goals of socialist society and various strategies proposed to achieve them in the context of the Soviet Union. Thus, we will examine Soviet development and politics as a product of the choices Soviet leaders have made, examining why those choices were made and with what results. The particular aspects of Soviet politics which will be emphasized are economic and social policy, human rights, nationality relations, and foreign policy.

### 130B. Politics in the People's Republic of China (4)

This course analyzes the political system of China since 1949, including political institutions, the policy-making process, and the relationship between politics and economics. The main focus is on the post-Mao era of reform beginning in 1978.

### 130CA-CB. Comparative Communism (4-4)

This course will examine the theory and practice of communist parties and socialist systems. We will compare the role of government, the nature of the party, the importance of national traditions, the structure of the economy, patterns of stratification, the organization of producer groups, and responses to deradicalization in China, the Soviet Union, Eastern Europe, and non-ruling communist movements in Europe and the Third World. The specific topics and countries covered will vary from year to year. Prerequisites: P.S. 130AA or 130B, or consent of instructor.

### 130D. Seminar: Chinese Politics (4)

(Formerly P.S. 134) This course will examine selected topics concerning major problems of political institutions, economic policy, and social change in postrevolutionary China. Students will do research projects. Prerequisite: P.S. 130B or consent of instructor.

### 130G. Vietnam: The Politics of the Village (4)

(Formerly P.S. 133A) This course will discuss the nature of Vietnamese society, especially its village structure, but also its religious, ethnic, and class divisions. Main focus is on the period of French colonialism and the origins of the Vietnamese revolution.

### 130H. Vietnam: The Politics of Intervention (4)

(Formerly P.S. 133B) This course will examine the interventions of foreign powers in Vietnam between 1945 and 1975 (including France, the United States, China, and the Soviet Union) and the effects of intervention.

### 130I. Vietnam: Special Topics in the Study of Revolution (4)

(Formerly P.S. 133C) An intensive examination of selected theoretical issues in the study of the political economy of revolution and counter-revolution.

### 132A. Political Modernization Theory (4)

(Formerly P.S. 139) A survey of state building and the politics of economic development in a world historical perspective. Special emphasis will be given to contemporary African cases. Prerequisite: upper-division standing or consent of instructor.

### 134AA-AB. Comparative Politics of Latin America (4-4)

(Formerly P.S. 187A-B) Comparative analysis of contemporary political systems and developmental profiles of selected Latin American countries, with special reference to the ways in which revolutionary and counter-revolutionary movements have affected the political, economic, and social structures observable in these countries today. Analyzes the performance of "revolutionary" governments in dealing with problems of domestic political management, reducing external economic dependency, redistributing wealth, creating employment, and extending social services. Introduction to general theoretical works on Latin American politics and devel-

opment first quarter. Intensive study of Chile and Cuba in second quarter. *Prerequisite: P.S. 134AA or 134AB.*

#### 134B. Politics in Mexico (4)

(Formerly P.S. 183) General survey of the Mexican political system as it operates today. Emphasis on sources of stability and instability in the contemporary Mexican state, relationships between the state and various segments of Mexican society (economic elites, peasants, urban labor, and the Church); Mexico's international economic relations, including its massive indebtedness to foreign banks.

#### 134C. Peasant Movements and Agrarian Problems in Latin America (4)

This course is about the political and economic problems confronting peasants in Latin America: Why, how, and what results have peasants participated in politics? What is the relationship between peasants and the state? Between peasants and other social classes? Topics include the political mobilization of peasants, the role of leadership and ideology in peasant movements, and peasant response to the commercialization of agriculture in two or three countries. *Prerequisite: department stamp required.*

#### 134D. Selected Topics in Latin American Politics (4)

(Formerly P.S. 131) A comparative analysis of contemporary political issues in Latin America. Material to be drawn from two or three countries. Among the topics: development, nationalism, political change.

#### 134G. Politics in the Andes (4)

A comparative examination of twentieth-century political conflicts and currents in the Andean countries of South America: Bolivia, Colombia, Ecuador, and Peru. Topics include economic underdevelopment, Indian relations, militarism, guerrilla warfare, and revolutionary movements. *Prerequisite: upper-division standing.*

#### 134I. Politics in the Southern Cone of Latin America (4)

This course is a comparative analysis of twentieth-century political developments and issues in the Southern Cone of Latin America: Argentina, Chile, and Uruguay. It emphasizes democratic vs. authoritarian alternatives, including options offered by such leaders as Salvador Allende, Juan Peron, and Augusto Pinochet. The course will also examine the social and economic content and results of contrasting political experiments. *Prerequisite: upper-division standing.*

#### 134J. Labor and Politics in Latin America (4)

The course explores the relationships between labor movements and the state, political parties, ideologies, and economic change in Latin America. Is organized labor in Latin America captive or powerful? Does it mobilize for stasis or change? Complex answers derived from a survey of cases and models describing workers' participation in Latin American politics. *Prerequisite: upper-division standing.*

#### 135A. Ethnic Conflict in the Third World

An analysis of the problems caused by ethnic cleavages in Third World countries and of the possibilities of conflict resolution by means of consociational methods. The principal cases that will be studied are Lebanon, Cyprus, Malaysia, and South Africa. *Prerequisite: upper-division standing or consent of instructor.*

#### 136A. African Politics (4)

(Formerly P.S. 144) An examination of pre- and post-colonial trends in African political organization. Economic management, dissemination of ideologies, leadership, and relations with other states will be among the topics considered.

#### 136B. Comparative Politics and Political Culture (4)

(Formerly P.S. 154) To what extent do aspects of culture — language, religion, family, history, beliefs, and values — influence the range of political behavior in any society, or define the range of questions on its political agenda? If in some way culture has an important bearing on politics, what are the mechanisms of real political change? To what extent is political change unidirectional toward some homogeneous industrialized world, and to what extent will heterogeneous cultures develop along divergent paths? These are the seminal questions around which this course will be organized. *Prerequisite: at least one course which studies a foreign country, or equivalent experience, or consent of instructor.*

#### 138A. The Political Economy of Urbanization (4)

(Formerly P.S. 188) The central theme of this course is public policy and its relationship to the spatial distribution of population and wealth. How have government policies and programs influenced the rural/urban and interregional dis-

parities in population, economic development, and social welfare which exist in most countries? Topics include modernization/developmentalist approaches to the study of urbanization, as compared with dependency/neo-Marxist approaches, colonial rule as a determinant of contemporary urbanization patterns, effects of public and private investments on internal migration, the relative effectiveness of various kinds of policy instruments for controlling or rechanneling national urban growth. Case materials are drawn from the experience of Latin American and African countries, with comparative reference to selected Asian nations, the U.S., and Western Europe. *Prerequisite: upper-division standing or consent of instructor.*

#### 138B. Politics of Rural Inequality (4)

(Formerly P.S. 190) What political and economic strategies have been or could be devised to deal with the problems of redistributing wealth within and to rural areas? Are such redistribution policies compatible with programs to maximize food production? What political and economic circumstances facilitate (or more often impede) implementation of such policies? Who benefits? These questions will be addressed with reference to specific policies (land reform, integrated rural development programs, resettlement schemes, commercialization of agriculture, etc.) in Latin America, Africa, and Asia.

#### 138D. Seminar: Advanced Topics in Comparative Politics (4)

(Formerly P.S. 165) A comparative analysis of the party systems of democratic regimes and their effects on the formation of government coalitions and government stability. Special attention will be paid to the work of the major comparative theorists of party systems, from Duverger to Sartori. The theories of coalition formation to be examined include those that attempt to predict which coalition is likely to be formed and those that seek to relate cabinet stability to the type of cabinet coalition.

## INTERNATIONAL RELATIONS

#### 140A. International Law and Organizations (4)

International law and organizations are central to the efforts to create a world order to limit armed conflict, regulate the world economy and advance programs for economic redistribution among nations, and set minimum standards of human rights. This course explains the theory of international law and organization that is accepted by diplomats and compares this viewpoint to the analysis of social scientists concerning the past record and likely future of world order concerning conflict, economic redistribution, and human rights.

#### 142A. United States Foreign Policy (4)

United States foreign policy from the colonial period to the present era. Systematic analysis of competing explanations for U.S. policies — strategic interests, economic requirements, or the vicissitudes of domestic politics. Interaction between the U.S., foreign states (particularly allies), and transnational actors are examined to underscore the complexities of the international environment which the U.S. faces. Particular emphasis will be placed on the moral dilemmas which confront the U.S. as leader of the Western industrialized nations.

#### 142C. Seminar: American National Security Policy (4)

(Formerly P.S. 171) (Same as STPA 142C.) Seminar in selected national security topics. Special emphasis will be placed on current U.S. military posture and arms control policies, and the rationales behind them. Other topics will include the strategic balance, the NATO/Warsaw Pact confrontations, the Middle East, SALT, and other arms control forums. *Prerequisite: P.S. 142B or STPA 170.*

#### 144AA-AB. Politics and the International Economic Order (4-4)

(Formerly P.S. 155A-B) This course examines the interplay of politics and economics in international relations. The first quarter entails a review of the history of the international economic order from the seventh century through the present. Stress is placed on the evolution of the bargaining about money, trade, and investment. The second quarter will consider major theories purporting to explain and predict the workings of the international order from the point of view of political economy. An extended discussion of one aspect of the economic order (e.g., the multinational corporation) will serve as the test case. *Prerequisites: P.S. 12 for 144AA and one quarter of economics are recommended; prerequisite for P.S. 144AB, consent of instructor.*

#### 144B. Comparative Responses to International Economic Crises (4)

(Formerly P.S. 169) What policies do countries select for dealing with economic problems? What political factors shape the choice among alternative policies for handling inflation, unemployment, foreign competition, exchange rates, industrialization, and other problems. What consequences does the controversy over economic policy have for such values as liberty, equality, peace, stability? Stress on Western Europe, North America, and Japan in the period after World War II.

#### 146A. The U.S. and Latin America: Political and Economic Relations (4)

(Formerly P.S. 185) Two central issues in U.S. relations with Latin America will be explored: 1) U.S. policies toward revolutionary and authoritarian regimes in the region; 2) changes in Latin American economic dependence on official aid and private investments from the U.S. These issues will be studied in historical perspective, looking toward policy issues for the 1980s and also at current problems in U.S. relations with two or three selected Latin American countries. (Offered in alternate years with P.S. 146C.)

#### 146BA-BB. Seminar on Mexico and U.S. Mexican Relations (4-4)

A seminar exploring fundamental sources of conflict and convergence between Mexico and the U.S. as well as current policy issues affecting bilateral relations. Determinants and consequences of U.S. and Mexican government policies toward each other are discussed. Attention to domestic development issues and politics in Mexico as they relate to U.S.-Mexican interactions, as well as aspects of the U.S. economy, society, and political system that affect Mexico. *Prerequisite: P.S. 134B or P.S. 146A or P.S. 128AA, 124AB (or consent of instructor if none of these courses has been taken).*

#### 146C. U.S.-Latin American Relations and the International Political Economy (4)

Development of Latin America and its relationship to the U.S. dominated international political economy. Oriented around the analysis of the industrialization process, trade, financial, and investment relations, with particular emphasis on the interaction between domestic and international factors to explain variations in national outcomes. Also examines efforts to counter the heavy presence of the U.S. by expanding regional and international factors to explain variations in national outcomes. *Prerequisites: one year economics and P.S. 144AA or AB. (Offered in alternate years with P.S. 146A.)*

#### 146D. Political Parties in Latin America (4)

Compares and contrasts different types of political parties in Latin America: conservative, liberal, populist, Christian democrat, socialist, and communist. Investigates their origins, ideologies, programs, leadership, followings, organizations, and successes or failures within varying political systems in different countries. *Prerequisite: upper-division standing.*

#### 150A. Seminar: The Political Economy of International Labor Migration (4)

(Formerly P.S. 184) A comparative survey of worker migration from Third World countries to industrialized and oil-rich countries, and the role of such labor transfers in the politics and economic development of both the labor exporting and labor importing countries. Topics include general theories of international labor migration, origins and evolution of such movements over time, characteristics of the migrants, effects of government policies on international labor flows, costs and benefits of the migration to various groups (individual migrants, their home communities, employers, governments, etc.), "nativist" movements, racial conflict, and other political consequences of immigration in industrialized societies. Cases to be emphasized: Mexican and Caribbean migration to the United States, Mediterranean-basin migration to Western Europe. *Prerequisite: consent of instructor.*

## POLICY ANALYSIS

#### 160AA. Introduction to Policy Analysis (4)

(Formerly P.S. 124A) (Same as STPA 124A.) In this course students will conduct analyses of public policy problems and decide which policy alternatives should be adopted. The problems will be drawn from fields including energy, the environment, health, and law enforcement. The purposes of this course are three-fold: to foster an appreciation of the complexity of policy problems; to teach methods for thinking about how to design better policies; and to convey some of the specific tools that analysis and policy-makers often use. *Prerequisite: upper-division standing or consent of instructor.*



## POLITICAL SCIENCE

### 160AB. Introduction to Policy Analysis (4)

(Formerly P.S. 124B) This course will emphasize the political and organizational problems of designing and implementing public policies. Students will carry out several analyses of policies. *Prerequisite:* P.S. 160AA.

### 160B. Projects in Policy Analysis (4)

This course will include group and individual projects applying policy analysis skills to current policy problems. *Prerequisites:* P.S. 160AA and senior standing.

### 162AC. Technology and Society (4)

(Formerly P.S. 105C) (Same as STPA 105C and Biology 183.) Policy issues raised by biomedical-scientific advances. The topical context varies from year to year. Included are such areas as intervention in human heredity and development, regulatory policy with respect to cancer and human population problems. Emphasis is on mechanisms for interaction of scientific expertise and other perspectives in policy making.

### 163AA. History of Arms Control Negotiations (4)

(Same as STPA 163A and History 173A.) This course deals with the history and process of international arms control negotiations in the nuclear age. Focus will be on the evolution of U.S. and Soviet nuclear weapons policies and efforts to control the superpower arms race. Topics will include the strategic balance, history of strategic concepts, weapons technology, the legacy of pre-World War II arms diplomacy, nuclear test bans, negotiations, and SALT/START. Students having taken P.S. 162AB or STPA 105B will not be allowed to take this course for credit. *Prerequisite:* upper-division standing.

### 163AB. START Simulation (4)

(Same as STPA 163B and History 173B.) A ten-week simulation of the U.S.-Soviet Strategic Arms Reduction Talks (START). Students will assume the roles of U.S. and Soviet governmental actors and will attempt to negotiate a START agreement. *Prerequisites:* P.S. 162AB, 163AA, STPA 105B, 163A, or History 173A and consent of instructor.

### 164A. The Politics of Medicine and Health (4)

(Formerly P.S. 166) (Same as STPA 164A.) This course will examine how government has acted to change the medical care system and protect public health. Problems of regulating doctors, evaluating new technologies, controlling costs, and improving health insurance will be examined. Do those issues have anything to do with reducing illness and death? *Prerequisite:* upper-division standing or consent of instructor.

### 164B. The Politics of Environmental Health and Safety Regulation (4)

(Formerly P.S. 177) (Same as STPA 177.) This course will examine the theory and practice of U.S. health and safety regulation with an emphasis on assessing how well it is working. Environmental carcinogens will get special attention. *Prerequisite:* upper-division standing and consent of instructor.

### 165. Crime, Punishment, and Public Policy (4)

This course examines and assesses public policies addressing the prevention of crime and the workings of the criminal justice system. *Prerequisite:* upper-division standing.

### 166B. Energy Policy and Politics (4)

(Formerly P.S. 159) Political, economic, and technological constraints on public policy responses to the energy problem will be explored. Case studies of the evolution of oil, natural gas, and nuclear policies will illustrate the argument. There will also be a discussion of the international dimensions of energy policies.

### 166D. Marine Policy (4)

(Formerly P.S. 161) (Same as STPA 161.) This course aims to provide a theoretical and factual framework for the study of marine policy and to examine several cases involving controversial issues. Among the issues: the porpoise-tuna controversy; manganese nodules and deep sea mining; coastal management and nuclear power; and liability for oil spills. *Prerequisite:* upper-division standing or consent of instructor.

### 166E. The Politics of Taxing and Spending (4)

This course examines how differences in political and fiscal institutions lead to differences in public policies. For example, what difference does it make which level of government operates a program? Are government budgets bigger when taxes are less visible and grow more automatically?

### 166F. The American Welfare State (4)

This course examines the building of the welfare state in the twentieth century. Topics include the legacy of progressivism,

the New Deal and Great Society; Reaganite retrenchment; social programs, party and electoral dynamics; and the welfare state's impact on groups and the class structure.

## RESEARCH METHODS

### 170A. Quantitative Political Science

An introduction to the use of quantitative methods in political science. Primary attention will be given to a study of how these methods are actually used so that students can intelligently interpret and evaluate quantitative articles. The advantages and disadvantages of quantitative work will also be discussed. Some attention will be paid to the use of quantitative methods for the study of public policy. Students will do a quantitative analysis of some political problem. *Prerequisite:* Social Science 60 or equivalent or consent of instructor.

### 170CA-CB. Statistical Methods/Data Analysis (4)

(Formerly P.S. 174A-B) This course will offer a general introduction to statistical methods and data analysis for students interested in political science, public policy, and communications research. Although calculus is not required, it is strongly recommended. The course will include a basic introduction to the theory and practice of statistical inference, measures of association, sampling theory, and linear regression models. There will be extensive work with computer data analysis systems such as SPSS, and each student will do a large-scale analysis project during the second half of the course. *Prerequisite:* upper-division standing or consent of instructor.

## SPECIAL STUDIES

### 191A-B. Senior Honors Seminar: Frontiers of Political Science (4-4)

This course will be taught jointly by the staff of the department with occasional lectures by visitors. It is open only to seniors interested in qualifying for departmental honors. Admission to the course will be determined by the department on the basis of the student's academic record. Each student enrolled will be required to write an honors essay under the supervision of a member of the faculty. This essay, which is to be submitted by the end of the winter quarter, will be the basis of the final grade for the course. *Prerequisites:* senior standing, G.P.A. of 3.5 in political science, or consent of the department.

### 195. Teaching Apprentice-Undergraduate (4)

Teaching and tutorial activities associated with courses and seminars. Only four units of 195 may be used for satisfying the department major requirement.

### 196A-B-C. Fieldwork in U.S.-Mexican Studies (4-4-4)

Field research on some problem relevant to contemporary Mexico and/or U.S.-Mexican political-economic relations, to be conducted in Mexico or among Mexican populations in the United States, by special arrangement with director of the Center for U.S.-Mexican Studies. At the end of the second or third quarter students will write a major paper based on fieldwork experience and assigned readings. *Prerequisite:* reading and speaking knowledge of Spanish is required.

### 197. Field Study in Political Science (4)

Fieldwork in the local area in some aspects of politics or public policy. The project should be largely designed by the student, with faculty supervision, and should contribute to an overall understanding of the political process.

### 198. Directed Group Study (2 or 4)

Directed group study in an area not presently covered by the departmental curriculum. (P/NP grades only.)

### 199. Independent Study for Undergraduates (2 or 4)

Independent reading in advanced political science by individual students. (P/NP grades only.) *Prerequisite:* consent of instructor.

## Graduate

### 200A. Special Topics in Economic Theory and Political Behavior (4)

This advanced seminar will focus on attempts to use economic theory in comparative and American politics. *Note: undergraduates may take this course only with the consent of the instructor and completion of P.S. 112A.*

### 205. Seminar on U.S. Immigration (4)

An interdisciplinary seminar covering origins, consequences, and characteristics of worker migration from Third

World countries (especially Mexico, Central America, and the Caribbean basin) to the United States, from the late nineteenth century to the present. Topics include: general theories of international labor migration; effects of government policies on migratory flows to the U.S.; the role of such population movements in the politics, society, and economic development of both the U.S. and labor-exporting countries; costs and benefits of the migration to various groups; "nativist" movements and other political reactions to immigration; the evolution of U.S. immigration law and policy. Comparisons with Mediterranean-basin migration to Western Europe. Material to be drawn from literatures in anthropology, economics, history, law, political science, and sociology.

### 209. Core Seminar in American Politics (4)

This course will provide a general literature review in American politics to serve as preparation for the field examination. *Prerequisite:* graduate standing in any discipline in the social sciences or humanities, or consent of the instructor.

### 210A. Systems of Political Thought (4)

(Formerly P.S. 200A) This course focuses on the development of politics and political thought in ancient Greece, its evolution through Rome, and the rise of Christianity. Readings are drawn from Plato, Aristotle, and Machiavelli. Students will attend lectures and carry out research and writing assignments designed for graduate students.

### 210B. Systems of Political Thought (4)

(Formerly P.S. 200B) The course deals with the period which marks the rise and triumph of the modern political person and the modern political state. Central topics include the relation of authority and community, political myth, and the gradual emergence of individuals capable of being their own (political) masters. Readings from Machiavelli, Shakespeare, Calvin, Hobbes, Locke, Diderot, and Rousseau. Students will attend lectures and carry out research and writing assignments designed for graduate students.

### 210C. Systems of Political Thought (4)

(Formerly P.S. 200C) The course deals with the period which marks the triumph and critique of the modern state. Central topics include the development of the idea of class, of the irrational, of the unconscious, and of rationalized authority as they affect politics. Readings drawn from Rousseau, Kant, Hegel, Marx, Mill, Nietzsche. Students will attend lectures and carry out research and writing assignments designed for graduate students.

### 220A. Special Topics in Comparative Politics (4)

This course is an examination of the different approaches to the study of comparative politics. Included will be state societies relations, political and economic development, public policy, the impact of international systems on domestic politics, political parties, and other institutions.

### 229A. Core Seminar in Comparative Politics (4)

This course will provide a general literature review in comparative politics to serve as preparation for the field examination. *Prerequisite:* graduate standing in any discipline in the social sciences or humanities, or consent of instructor.

### 229B. Core Seminar in Comparative Politics (4)

This is a second course in comparative politics designed as a preparation for the field examination. It will focus on the comparative study of political institutions. *Prerequisite:* Graduate standing in any discipline in the social sciences or humanities, or consent of instructor.

### 230A-B. Research Seminar on Modern Mexico (4-4)

An interdisciplinary graduate seminar covering selected aspects of Mexican politics, economic development, and social change. Attention to both domestic and international factors affecting Mexico's political economy. Material to be drawn from literatures in anthropology, economics, history (twentieth century), political science, sociology, urban studies, and communications. Topics vary from year to year, partly reflecting research interests of participating students. Students are expected to write substantial research papers or thesis proposals, in consultation with instructor, home department advisers, and visiting scholars in residence at the Center for U.S.-Mexican Studies.

### 234AA-AB. Comparative Politics of Latin America (4-4)

(Formerly P.S. 287A-B) Comparative analysis of contemporary political systems and developmental profiles of selected Latin American countries, with special reference to the ways in which revolutionary and counter-revolutionary movements have affected the political, economic, and social structures observable in these countries today. Analyzes the perfor-

mance of "revolutionary" governments in dealing with problems of domestic, political management, reducing external economic dependency, redistributing wealth, creating employment, and extending social services. Intensive study of Mexico, Peru, Chile, Cuba and Nicaragua, particularly in second quarter; introduction to general theoretical works on Latin American politics and development. Students will attend lectures and carry out research and writing assignments designed for graduate students.

**249. Core Seminar in International Relations (4)**

This course will provide a general literature review in international relations to serve as preparation for the field examination. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of instructor.*

**260AA. Introduction to Policy Analysis (4)**

In this course students will conduct analyses of public policy problems and decide which policy alternatives should be adopted. The problems will be drawn from fields including energy, the environment, health, and law enforcement. The purposes of this course are three-fold: to foster an appreciation of the complexity of policy problems, to teach methods for thinking about how to design better policies, and to convey some of the specific tools that analysis and policy-makers often use. Students will attend lectures and carry out research and writing assignments designed for graduate students.

**260AB. Introduction to Policy Analysis (4)**

This course will emphasize the political and organizational problems of designing and implementing public policies. Students will attend lectures and carry out research and writing assignments designed for graduate students.

**269. Core Seminar in Political Economy and Public Policy (4)**

This course will provide a general literature review in political economy and public policy to serve as preparation for the field examination. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of instructor.*

**270A-B. Quantitative Methods in Political Science (4-4)**

Introduction to quantitative methods for graduate students with little prior preparation in statistics. Students will attend undergraduate lecture for P.S. 270A,B and also attend a weekly one-hour seminar. Each student will complete a quantitative project by the end of the winter quarter. Emphasis will be on theoretical understanding rather than computations.

**270C. Designing Political Research (4)**

The theory and practice of research in political science. This course examines the major approach to the study of politics represented by significant works in the discipline. It considers how interesting and important questions are discovered and how research appropriate to them is designed and executed.

**290. Directed Reading in American Politics (4)**

Directed reading in a selected area of American politics for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**291A-B. Research in Political Science (4-4)**

Independent work by graduate students engaged in research and writing of the second-year paper, under direct supervision of the adviser. The paper will be the basis for the grade in both courses.

**292. Directed Reading in Comparative Politics (4)**

Directed reading in a selected area of comparative politics for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**293. Directed Reading in International Relations (4)**

Directed reading in a selected area of international relations for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**294. Directed Reading in Political Economy (4)**

Directed reading in a selected area of political economy for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**295. Directed Reading in Public Policy (4)**

Directed reading in a selected area of public policy for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**296. Directed Reading in Political Theory (4)**

Directed reading in a selected area of political theory for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's supervisory committee.

**298. Directed Reading (1-12)**

Guided and supervised reading in the literature of the several fields of political science.

**299. Independent Research (1-12)**

Independent work by graduate students engaged in research and writing of second-year paper and doctoral dissertation, under direct supervision of adviser.

**500. Apprentice Teaching (1-4)**

A course in which teaching assistants are aided in learning proper teaching methods by means of supervision of their work by the faculty: handling of discussions, preparation, and grading of examinations and other written exercises, and student relations. Twenty-four units of teaching apprenticeship meets the department teaching requirement for the Ph.D. degree.

- Ian N. Creese, Ph.D. (*Professor of Neurosciences*)
- Francis Crick, Ph.D. (*Adjunct Professor of Psychology*)
- Diana Deutsch, Ph.D. (*Research Psychologist*)
- Robert Galambos, Ph.D., M.D. (*Professor Emeritus, Neurosciences*)
- Steven A. Hillyard, Ph.D. (*Professor of Neurosciences*)
- George F. Koob, Ph.D. (*Adjunct Associate Professor of Psychology*)
- William J. McGill, Ph.D. (*Adjunct Professor of Psychology*)
- John M. Polich, Ph.D. (*Adjunct Assistant Professor of Psychology*)
- David S. Segal, Ph.D. (*Professor of Psychiatry*)
- Larry R. Squire, Ph.D. (*Professor In Residence, Psychiatry*)
- David Zipser, Ph.D. (*Research Cognitive Scientist*)

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**The Undergraduate Program**

**The Psychology Major Program**

The department offers courses in all major areas of experimental psychology, with emphasis in the areas of cognitive psychology and human information processing, sensation and perception, learning and motivation, physiological psychology, developmental psychology, psycholinguistics, and social psychology. The department emphasizes research in the experimental and theoretical analysis of human and animal behavior. Students who major in psychology can expect to develop a knowledge of a broad range of content areas, as well as basic skills in experimental and analytic procedures.

The department offers a flexible program of study towards the B.A. degree in psychology. Several different options are available, ranging from a general curriculum which allows for diversity of studies to a specialized curriculum which allows the student to explore a limited number of topic areas in great depth. An honors program — requiring laboratory courses and a year-long individual research project — is also available to students. The honors program is specifically designed for students interested in preparing for graduate or professional school.

**Prerequisites for Psychology Majors**

Experimental psychology uses the tools and knowledge of science: calculus, probability theory, computer science,

**PSYCHOLOGY**

OFFICE: 5217 Psychology and Linguistics Building, Muir College

**Professors:**

- Norman H. Anderson, Ph.D.
- Richard C. Atkinson, Ph.D. (*Chancellor*)
- Elizabeth A. Bates, Ph.D.
- Robert M. Boynton, Ph.D.
- Michael Cole, Ph.D.
- J. Anthony Deutsch, D. Phil.
- Ebbe B. Ebbesen, Ph.D. (*Chairman*)
- Edmund J. Fantino, Ph.D.
- Vladimir J. Konecni, Ph.D.
- Donald I.A. MacLeod, Ph.D.
- George Mandler, Ph.D.
- Jean M. Mandler, Ph.D.
- Donald A. Norman, Ph.D.
- George S. Reynolds, Ph.D.
- Laura E. Schreibman, Ph.D.
- Ben A. Williams, Ph.D.

**Associate Professors:**

- Carol M. Cicerone, Ph.D.
- James A. Kulik, Ph.D.
- Jeffrey O. Miller, Ph.D.

**Assistant Professors:**

- Harold E. Pashler, Ph.D.
- Vilayanur S. Ramachandran, Ph.D., M.B.B.S.
- Joan Stiles-Davis, Ph.D.

\* \* \*

- Ursula Bellugi, Ed.D. (*Adjunct Professor of Psychology*)
- Nelson M. Butters, Ph.D. (*Professor in Residence, Psychiatry*)



## PSYCHOLOGY

chemistry, biology, statistics, and physics. Accordingly, students in upper-division courses must have an adequate background in these topics. Prerequisites for individual courses are specified in the catalog listings for the courses.

A B.A. degree in psychology will be granted if the following requirements have been met:

1. The student has completed the prerequisites for the psychology major, which are (a) three quarters of a natural science (i.e., biology, chemistry and physics), other than psychology (Biology 50 cannot be used as one of the natural science courses); (b) three quarters of university level mathematics (not including statistics and computer courses), at least one of which must be calculus (three quarters of calculus is recommended); (c) introduction to computer programming [Biology 50, CSE 62B, CSE 65, Math. 71 (formerly Math. 175), Math. 77 (formerly Math. 177) or AMES 10 at UCSD, or equivalent]. The student is encouraged to complete these requirements by the end of the sophomore year if possible. All of these courses may be taken Pass/No Pass.
2. The student has completed one quarter of statistics (Psychology 60 or equivalent). Statistics must be taken for a letter grade.
3. The student has completed any twelve upper-division courses in psychology. Advanced statistics (Psychology 111 or an equivalent from another department) may be included in the twelve courses. Upper-division courses must be taken for a letter grade in order to count toward the major.

Neither Psychology 199 nor Warren 197 can be counted toward the major, and Psychology 195 may be counted only once. Graduate research seminars (usually designated as "Special Topics in . . .") cannot be counted toward the major. **A minimum of six upper-division courses must be taken at UCSD.** A grade-point average of at least 2.0 in the upper-division courses is required for graduation.

A major consideration in deciding the specific program one will pursue are the prerequisites of the various upper-division psychology classes taught by the department. The student should note the prerequisites for *all* of the classes he or she might be interested in taking. It is important to take those classes which are prerequisites for many others early in one's

program. For example, students are well advised to take Introduction to Statistics (60) in their sophomore year, or sooner, as it is a prerequisite for many other psychology classes. Similarly, many of the classes which serve as introductions to the various areas of psychology (e.g., Introduction to Sensation and Perception and Introduction to Social Psychology) are prerequisites for more advanced courses in those areas. Therefore, these classes should also be taken early in one's college career.

### Advising

All students majoring in psychology are assigned a faculty member as a permanent adviser. Such assignment occurs at the main department office (P&L 5217) when the student announces his or her intention to major. The student then plans his or her major program with the aid of the adviser. Such planning should take place in the student's sophomore year or as soon as possible thereafter to insure that ample time is available to satisfy the necessary prerequisites for the courses taught in the department.

### Preparation for Graduate School

Regardless of the area of specialization that a student chooses to pursue, it is strongly advised that he or she obtain a strong general background in psychology, a strong background in statistics and experimental methods, and a strong background in research, including laboratory courses and independent research. A recommended program of study to accomplish these goals is the following:

- At least four courses from the group numbered Psychology 101-108.
- At least one (and preferably more) laboratory course(s) (Psychology 115, 116, 121, 126, and 127).
- Introduction to Statistics and Advanced Statistics (Psychology 60 and 111).
- The Senior Independent Research Project (Psychology 194A-B-C).
- Other upper-division courses in the chosen area(s) of specialization (See course groupings listed below.)

The above program is recommended for all students planning to go on to graduate school, as well as those interested in a clinical graduate program. Experience in research methodology and a general knowledge of psychology are considered the most important features of a strong major in psychology and are preferred over a large number of courses in any one particular area.

### Program in General Psychology

Although students are permitted to choose any twelve upper-division courses to fulfill the major requirements, a broad background in psychology is strongly advised. Students interested in obtaining such a background should consider the following courses:

- Psychology 60 (Introduction to Statistics)
- Psychology 101 (Introduction to Developmental Psychology)
- Psychology 102 (Introduction to Sensation and Perception)
- Psychology 103 (Introduction to the Principles of Behavior)
- Psychology 104 (Introduction to Social Psychology)
- Psychology 105 (Introduction to Cognitive Psychology)  
OR Psychology 107 (Introduction to Cognitive Science)
- Psychology 106 (Introduction to Physiological Psychology)
- Psychology 108 (Introduction to Experimental Psychology)
- Psychology 163 (Abnormal Psychology)
- Psychology 166 (History of Psychology)

in addition to other upper-division electives that may be of particular interest to the student.

### Specialized Programs

Some students may wish to obtain a more intensive exposure to one or more areas of specialization within psychology. (However, be advised that such specialization at the undergraduate level is not necessary for students wishing to pursue graduate studies in psychology. *Many graduate programs prefer to accept students with a broad background in psychology*, and almost none has specialized undergraduate training as a prerequisite for admission.) To aid the student's selection, the courses falling within particular areas of specialization are listed below. Note that students wishing to specialize in an area need not take all of the courses listed under that area. Groupings of courses are presented only to indicate which courses are most pertinent to each specialty area.

### Developmental Psychology

The department's offerings in human development are concentrated in the area of **cognitive development**. Students interested in this area should consider the following courses:

- Psychology 60 (Introduction to Statistics)
- Psychology 101 (Introduction to Developmental Psychology)
- Psychology 105 (Introduction to Cognitive Psychology)  
OR Psychology 107 (Introduction to Cognitive Science)
- Psychology 136 (Cognitive Development: Piaget)
- Psychology 145 (Psycholinguistics)
- Psychology 156 (Cognitive Development in Infancy)
- Psychology 163 (Abnormal Psychology)
- Psychology 168 (Psychological Disorders of Childhood)

Since development occurs in all sub-areas, students interested in **development** would do well to take as many of the following as possible:

Psychology 102 (Introduction to Sensation and Perception)  
 Psychology 103 (Introduction to the Principles of Behavior)  
 Psychology 104 (Introduction to Social Psychology)  
 Psychology 105 (Introduction to Cognitive Psychology)  
 OR Psychology 107 (Introduction to Cognitive Science)  
 Psychology 106 (Introduction to Physiological Psychology)

## Social Psychology

Psychology 60 (Introduction to Statistics)  
 Psychology 104 (Introduction to Social Psychology)  
 Psychology 111 (Advanced Statistics)  
 Psychology 126 (Experimental Methods in Social Psychology)  
 Psychology 127 (Methods in Applied Social Psychology)  
 Psychology 143 (Emotion)  
 Psychology 146 (Culture and Thought)  
 Psychology 147 (Social Perception and Cognition)  
 Psychology 148 (Psychology of Judgment and Decision)  
 Psychology 149 (Social Psychology and Dramatic Arts)  
 Psychology 155 (Social Psychology and Medicine)  
 Psychology 161 (Human Aggressive Behavior)  
 Psychology 162 (Psychology and the Law)  
 Psychology 167 (Social and Emotional Development)

## Cognitive Psychology

Psychology 60 (Introduction to Statistics)  
 Psychology 102 (Introduction to Sensation and Perception)  
 Psychology 105 (Introduction to Cognitive Psychology)  
 OR Psychology 107 (Introduction to Cognitive Science)  
 Psychology 111 (Advanced Statistics)  
 Psychology 115 (Laboratory in Cognitive Psychology)  
 Psychology 133A-B (Psychology and Artificial Intelligence)  
 Psychology 134 (Psychology of Thinking)  
 Psychology 135 (Cognitive Engineering)  
 Psychology 136 (Cognitive Development: Piaget)  
 Psychology 137 (Cognition and the Brain)  
 Psychology 145 (Psycholinguistics)  
 Psychology 146 (Culture and Thought)  
 Psychology 147 (Social Perception and Cognition)  
 Psychology 148 (Psychology of Judgment and Decision)

## Sensation and Perception

Psychology 60 (Introduction to Statistics)  
 Psychology 102 (Introduction to Sensation and Perception)  
 Psychology 105 (Introduction to Cognitive Psychology)  
 OR Psychology 107 (Introduction to Cognitive Science)  
 Psychology 116 (Laboratory in Sensory Psychology)  
 Psychology 159 (Physiological Basis of Perception)

## Learning and Motivation

Psychology 60 (Introduction to Statistics)  
 Psychology 103 (Introduction to the Principles of Behavior)  
 Psychology 120 (Learning and Motivation)  
 Psychology 121 (Laboratory in Operant Psychology)  
 Psychology 150 (Comparative Psychology)  
 Psychology 151 (Control and Analysis of Human Behavior)  
 Psychology 154 (Behavior Modification)  
 Psychology 168 (Psychological Disorders in Childhood)  
 Psychology 177 (Experimental Psychopathology)

## Physiological Psychology

Psychology 60 (Introduction to Statistics)  
 Psychology 102 (Introduction to Sensation and Perception)  
 Psychology 106 (Introduction to Physiological Psychology)  
 Psychology 116 (Laboratory in Sensory Psychology)  
 Psychology 137 (Cognition and the Brain)  
 Psychology 139 (Brain Damage and the Mind)  
 Psychology 150 (Comparative Psychology)  
 Psychology 159 (Physiological Basis of Perception)

## Clinical Psychology

Psychology 60 (Introduction to Statistics)  
 Psychology 101 (Introduction to Developmental Psychology)  
 Psychology 104 (Introduction to Social Psychology)  
 Psychology 106 (Introduction to Physiological Psychology)  
 Psychology 124 (Human Mental Illness)  
 Psychology 130 (Developmental Psychology and Education)  
 Psychology 138 (Alcohol and Other Drugs of Addiction)  
 Psychology 143 (Emotion)  
 Psychology 155 (Social Psychology and Medicine)  
 Psychology 161 (Human Aggressive Behavior)  
 Psychology 162 (Psychology and the Law)  
 Psychology 163 (Abnormal Psychology)  
 Psychology 167 (Social and Emotional Development)  
 Psychology 179 (Drugs, Addiction and Mental Disorder)

The courses listed under *learning and motivation* are also relevant for students interested in behavior modification as an approach to clinical psychology.

## Honors Program

Students are encouraged to participate in the departmental honors program. The major feature of the program is a year-long independent research project (194) done in the student's senior year which results in an honors thesis. The honors project normally will be under the supervision of a faculty member in the Department of Psychology. In preparation for such a project the honors candidate must take:

Introduction to Computer Science  
 (CSE 65, or equivalent)  
 Introduction to Statistics (60)  
 Advanced Statistics (111)  
 Any Methods or Laboratory Course  
 (115, 116, 121, 126, 127)

Successful completion of the honors program requires a grade of A in Psychology 194 and a minimum grade-point average of 3.5 for courses taken in the major.

The honors program is strongly recommended for all students interested in post-graduate schools.

## Undergraduate Major Program in Cognitive Science

The undergraduate program in cognitive science spans the several disciplines relevant to the study of intelligent systems, both human and artificial. Students will

learn substance and method, including developments in the modeling of intelligent systems by both mathematical and computer simulation techniques as well as experimental techniques for analyzing human information processing. The focus of the program lies within cognitive psychology and computer science, but aspects of linguistics, sociology, anthropology, and communication are also included. Graduates will be prepared for graduate study in some aspect of cognitive science. There are increasing employment possibilities for recipients of the B.A. degree in numerous industrial research and applied firms.

## Cognitive Science Major Course Requirements

**Lower-division prerequisites.** Lower-division prerequisites provide a firm background in mathematics (calculus and probability theory), computer programming, and an introduction to the study of human information processing. Students are required to have taken Mathematics 1A-B-C (or preferably, the 2A-B-C sequence), a one-quarter introduction to mathematical statistics (Psychology 60 or, preferably Mathematics 180A) CSE 62A-B or 65 (Introduction to Programming), and CSE 70 (Introduction to Systems Programming). It is extremely important that these courses be completed prior to the junior year, since they serve as prerequisites for the junior-year courses.

**Upper division.** A total of fifteen upper-division courses are required.

**The core-course sequence.** All of the following courses constitute the "core sequence," and are required of all students.

Psychology 107 (Cognitive Science)  
 or Psychology 105 (Cognitive Psychology)  
 Psychology 111 (Advanced Statistics)  
 Psychology 115 (Laboratory in Cognitive Psychology)  
 CSE 160A (Foundation of Computer Science)  
 CSE 161A-B (Digital System Software)  
 or Math. 176A-B (Computer Implementations of Data Structures)  
 CSE 162 (Functional Programming Using LISP)  
 CSE 178A-B (Artificial Intelligence I & II)  
 or Math. 179A-B (Introduction to Artificial Intelligence)

Psychology 107 or 105, 111, 115, and CSE 160A and 161A-B (or Math. 176A-B) should be taken during the junior year. Note that CSE 162 is a prerequisite for CSE 178A-B, and Psychology 111 requires a minimum grade of B in either Psychology 60 or equivalent.

**Electives.** The remaining part of the major comprises electives taken from the list below. Other courses may be substituted with the written permission of a cognitive science faculty adviser.

## PSYCHOLOGY

The courses which have been approved for inclusion in the cognitive science major program are listed in groups according to content area (courses relevant to multiple areas are multiply listed). A student may choose to specialize in one of these areas, in which case he or she might take most of the electives in that area. Alternatively, the student may choose to obtain a broader introduction to the different sorts of areas related to cognitive science, in which case any combination of the listed courses may be chosen. The set of electives a student chooses should be carefully selected not only to satisfy the individual's immediate interests but also with a view toward optimal preparation for graduate work or employment.

### Cognition and Cognitive Development

**Psychology 101 (Introduction to Developmental Psychology)**  
**Psychology 135 (Cognitive Engineering)**  
**Psychology 136 (Cognitive Development: Piaget)**  
**Psychology 137 (Cognition and the Brain)**  
**Psychology 139 (Brain Damage and the Mind)**  
**Psychology 143 (Emotion)**  
**Psychology 146 (Culture and Thought)**  
**Psychology 165 (Explanation and Knowledge)**

### Culture and Communication

**Anthropology 118 (Cognitive Anthropology)**  
**Anthropology 125 (Language and Culture)**  
**Psychology 146 (Culture and Thought)**

### Computation

**CSE 160B (Foundations of Computer Science)**  
**CSE 165 (Algorithms, Automata, and Formal Languages)**  
**CSE 163A-B (Compiler Construction)**  
**CSE 173 (Comparative Study of Programming Languages)**  
**CSE 179 (Analysis of Algorithms)**  
**Psychology 135 (Cognitive Engineering)**

### Language

**Linguistics 101A-B (Introduction to Syntax)**  
**Linguistics 125 (Introduction to Semantics)**  
**Linguistics 131A-B (Introduction to Mathematical Linguistics)**  
**Linguistics 182 (Language and the Brain)**  
**Psychology 145 (Psycholinguistics)**

### Physiological and Sensory Mechanisms

**Psychology 102 (Introduction to Sensation and Perception)**  
**Psychology 106 (Introduction to Physiological Psychology)**  
**Psychology 116 (Laboratory in Sensory Psychology)**  
**Psychology 129 (Logic of Perception)**  
**Psychology 137 (Cognition and the Brain)**  
**Psychology 159 (Physiological Basis of Perception)**

## THE MINORS PROGRAM

### The Noncontiguous Minor for Revelle College

Students may enroll in psychology courses in order to fulfill the requirements

of the noncontiguous minor. The noncontiguous minor will normally consist of three of the lower-division courses in psychology and three courses selected from the upper-division offerings of the department. Please note carefully the prerequisites for the upper-division courses. Students who wish to pursue a noncontiguous minor should consult with one of the departmental undergraduate advisers before enrolling in these courses. Lower-division psychology courses may not be used simultaneously to satisfy both the social science requirement and the noncontiguous minor requirement.

### Minor Program for Third College

Third College students may minor in psychology by completing a six-course sequence in psychology which must include at least three upper-division courses. At the beginning of their program planning, students should carefully examine the prerequisites for each of the courses to be used for the minor and consult with one of the departmental undergraduate advisers. Note in particular that introductory Statistics (Psychology 60) is a prerequisite for almost all upper-division courses.

### Minor Program for Warren College

Warren College requires its students to complete two six-course sequences to fulfill the area-of-concentration requirements. Six of these twelve courses must be upper-division. A student may minor in psychology by choosing a six-course sequence, at least three courses of which must be upper-division.

## The Graduate Program

The Department of Psychology provides broad training in experimental psychology. Increased specialization and the general burgeoning of knowledge make it impossible to provide training in depth in every aspect of experimental psychology, but most aspects are represented in departmental research.

### Preparation

Apart from the general university requirements, the department generally expects adequate undergraduate preparation in psychology. A major in the subject, or at least a strong minor, is normally a prerequisite, but applicants with good backgrounds in such fields as biology and mathematics are also acceptable.

### Language Requirements

There is no foreign language requirement.

## Master's Degree Program

Normally, students will be accepted only for the Ph.D. Students in the doctoral program may, however, qualify for the M.A.

Plan II has been adopted by the department (see "Graduate Studies: The Master's Degree"). Each candidate must complete a two-course requirement in quantitative methods and at least six additional graduate courses other than the research courses 296, 298, and 299. Each candidate must also pass the master's examination, which is offered by the department once each year.

## Graduate Curriculum

All students must fulfill all course requirements — stated below — while registered as graduate students in psychology at UCSD. There may occasionally be exceptions granted to this rule. Requests for exception should be in the form of petitions from students and their advisers to the Committee on Graduate Affairs. It is in the best interest of the student if these petitions are forthcoming at the time of admission to the graduate program. In this way, the committee, the students, and their advisers will all be aware of the course requirements before any of them are taken.

### Program of Study

Courses are divided into five areas: cognitive (including attention, language, perception), developmental (including language acquisition), learning and motivation (including basic and applied), sensory and physiological (including vision, audition and neurophysiology), and social (including health and law). The Graduate Affairs Committee provides an approved list of courses from these areas. In the first year of study, each student must fulfill the following four requirements:

1. Each student must fulfill a quantitative methods requirement, either by taking two quantitative methods courses approved by the graduate committee or by showing a satisfactory knowledge of these courses through an examination.
2. In addition to the quantitative methods requirement, each student is expected to take four "basic" courses from the list prepared by the Graduate Affairs Committee. Five basic proseminars will be offered (one for each of the five areas). They will be offered every year and may be one to three quarters in length. Each entering student will be

required to take at least one quarter in each of three areas and a total of four quarters altogether. No more than two quarters from any one of the five areas may be counted toward the basic requirement. In all, eight courses (including the basic courses) are required and must be completed by the end of the third year.

- Each first-year graduate student is required to submit a research paper on the project completed as a part of a research practicum. The paper should be comparable in style, length, and quality to papers published in the normal, refereed journals of the student's research area. (The publication manual of the American Psychological Association, third edition, 1983, gives an acceptable format.)

The research paper will be read and evaluated by the student's research adviser and by at least two other readers appointed by the graduate adviser. The paper will be graded on a five-point scale: +, 0+, 0, 0-, -. Additional readers may be required when there are conflicting evaluations.

The research paper is presented orally at a research meeting held at the end of the spring quarter. Attendance at this meeting is a requirement for the department's graduate students and faculty. Typically, each student is allowed ten minutes to present the paper, with a five-minute question period following the presentation.

- A teaching requirement must be met. (See below.) Students are evaluated by the entire faculty at the end of the academic year. The normal minimum standards for allowing a student to continue beyond the first year are completion of all department requirements, satisfactory completion of the first-year research project (including the oral presentation), a B+ average in the quantitative methods courses, and a B+ average in other course work.

By the end of the third year of study the student is expected to have completed at least eight courses from the list of courses approved by the Graduate Affairs Committee. At least three of the areas listed above must be represented. Any student whose needs cannot be reasonably met with courses conforming to these guidelines is encouraged to petition the Graduate Affairs Committee. The petition should contain a specific list of

courses and a statement of justification and must be approved by the student's adviser.

### Qualifying Examination for the Ph.D. Degree

The qualifying examination is divided into two sections to be taken separately by all students. *Part I* is the written examination. The student lays out the issues of his or her interest and the most relevant readings, including the kinds of questions on which he or she would like to write. A finalized reading list and set of questions is negotiated between the student and the doctoral committee after which the student selects a week during which he or she will produce polished answers to the questions. No outside examiners are involved in this part of the examination. *Part II* of the qualifying examination is the defense of the dissertation proposal. This will normally follow Part I of the qualifying examination and will be an oral examination including outside examiners.

### Teaching

Each student is required to participate in the teaching activities of the department for one quarter of half-time teaching every year for a total of four years.

### Residency

Each student must complete the requirements for qualification for candidacy for the Ph.D. degree by the end of the third year of residence. Any student failing to qualify by this time will be placed on probation. A student who fails to qualify by the end of the spring quarter of the fourth year of residence will automatically be terminated from the department.

No student may allow more than eight calendar years to elapse between starting the graduate program and completing the requirements for the Ph.D. degree. Students will automatically be terminated from the program at the end of the spring quarter of their eighth calendar year in the department.

### Research

In each year of graduate study all students are enrolled in a research practicum (Psychology 270 in the first year; Psychology 296 in subsequent years). Students are assigned to current research projects in the department, and receive the personal supervision of a member of the staff.

## Courses

### Lower Division

#### Experimental Requirements

Psychology at UCSD is a laboratory science. We are concerned with the scientific development of knowledge about human and animal behavior and thought. Accordingly, experience with experimental procedures plays an important role in the undergraduate and graduate training of students. Psychology majors must all learn experimental methods, including basic statistical techniques. Those in the honors program must take laboratory courses and also do a year-long undergraduate thesis.

#### Lower-Division Students

Students enrolled in the lower-division courses must serve as experimental subjects for participation in three hours per quarter. The requirement is intended to be a positive educational supplement to the course work. Part of each experimental session will be devoted to explanation and discussion of the purpose and nature of the experiment (this will usually be done at the end of the experimental session). Students always have the right to discontinue participation at any point in any study. Students who are unable to participate or who choose not to participate will be provided alternate service assignments which are designed to serve similar educational goals.

#### 1. Psychology (4)

A comprehensive series of lectures covering the basic concepts of modern psychology in the areas of human information processing, learning and memory, motivation, developmental processes, language acquisition, social psychology, and personality.

#### 2. General Psychology: Biological Foundations (4)

A survey of physiological and psychological mechanisms underlying selected areas of human behavior. Emphasis will be upon sensory processes, especially vision, with emphasis also given to the neuropsychology of motivation, memory, and attention.

#### 3. General Psychology: Cognitive Foundations (4)

This course is an introduction to the basic concepts of cognitive psychology. The course surveys the areas of memory, perception, and thinking. The course also provides an introduction to the issues of cognitive development.

#### 4. General Psychology: Behavioral and Social Foundations (4)

This course will provide a basic introduction to behavioral psychology (covering such topics as, classical conditioning, operant conditioning, animal learning and motivation, and behavior modification) and to social psychology (covering such topics as emotion, aesthetics, behavioral medicine, person perception, attitudes and attitude change, and behavior in social organizations). Behavioral empiricism will be the organizing theme that will tie these areas together. Each lecture will focus on the things that researchers do to develop theories of human social behavior. The emphasis will be on experimental and quasi-experimental methods.



## PSYCHOLOGY

**14. Social Psychology Applied to Human Problems (4)**  
An introduction to concepts and methods in social psychology. (Not offered in 1987-88.)

**60. Introduction to Statistics (4)**  
Introduction to the experimental method in psychology and to mathematical techniques necessary for experimental research. *Prerequisite: one year of mathematics or consent of instructor.*

### Upper Division

**101. Introduction to Developmental Psychology (4)**  
A lecture course on a variety of topics in the development of the child, including the development of perception, cognition, language, and sex differences. *Prerequisite: Psych. 60.*

**102. Introduction to Sensation and Perception (4)**  
An introduction to problems and methods in the study of perceptual and cognitive processes. *Prerequisite: Psych. 60 or one year of college-level mathematics.*

**103. Introduction to Principles of Behavior (4)**  
An example of the principles of conditioning and their application to the control and modification of human behavior.

**104. Introduction to Social Psychology (4)**  
An intensive introduction and survey of current knowledge in social psychology. *Prerequisite: Psych. 60.*

**105. Introduction to Cognitive Psychology (4)**  
Introduction to experimental study of higher mental processes. Topics to be covered include pattern recognition, perception, and comprehension of language, memory, and problem solving. *Prerequisite: junior standing.* (NOTE: Students may not receive credit for both Psych. 105 and 107.)

**106. Introduction to Physiological Psychology (4)**  
Intensive introduction to current knowledge of physiological factors in learning, motivation, perception, and memory.

**107. Introduction to Cognitive Science (4)**  
Introduction to theories and issues in cognitive science, emphasizing concepts from experimental psychology and artificial intelligence. The emphasis is on the computational nature of intelligent behavior in humans, animals, machines and groups. *Prerequisite: CSE 70.* (NOTE: Students may not receive credit for both Psych. 107 and 105.)

**108. Introduction to Experimental Psychology (4)**  
Various members of the psychology faculty will discuss their current research with special emphasis upon methodological problems. *Prerequisite: Psych. 60.*

**111. Advanced Statistics (4)**  
Intermediate examination of the experimental method in psychology and mathematical techniques necessary for experimental research. *Prerequisite: minimum grade of B in either Psych. 60 or equivalent.*

**115. Laboratory in Cognitive Psychology (4)**  
Lecture and laboratory work in human information processing. *Prerequisites: Psych. 105 and 111 or consent of the instructor.*

**116. Laboratory in Sensory Psychology (4)**  
An introduction to the experimental measurement and analysis of auditory and visual phenomena. *Prerequisites: Psych. 159 (co-registration permitted) and Psych. 111.*

**120. Learning and Motivation (4)**  
Survey of research and theory in learning and motivation. Includes instincts, reinforcement, stimulus control, choice, aversive control, and human application. *Prerequisite: co-registration with Psych. 121.*

**121. Laboratory in Operant Psychology (4)**  
Lecture and laboratory in operant psychology. *Prerequisite: must be taken with Psych. 120.*

**124. Human Mental Illness (4)**  
This course will provide an introduction to the study of human mental illness with emphasis on physiological and pharmacological aspects. (Not offered in 1987-88.)

**126. Experimental Methods in Social Psychology (4)**  
Lecture and laboratory work in social psychology. *Prerequisites: Psych. 104 and 111, or equivalent.* (Not offered in 1987-88.)

**127. Methods in Applied Social Psychology (4)**  
Emphasizes learning of experimental and quasi-experimental methodology applicable to social problems. Students carry out field research in areas such as the psychology of law (judicial decision making), traffic-related behavior (risk taking), environmental psychology, and other areas of student interest. *Prerequisites: Psych. 104 and 60.*

**128. Practicum in Child Development (4)**  
This course is intended as a combined lecture and laboratory course for seniors in psychology and communication. Their backgrounds should consist of a solid background in general psychology or communication and human information processing. The course will meet for two hours a week of lectures and discussion. Students will be expected to spend four hours a week of supervised, practical experience in a field setting involving children. An additional six hours of student time will be devoted to reading, transcribing field notes, and writing a paper on some aspect of the fieldwork experience as it relates to class lectures and readings. Evaluation of the course will be based on performance in classroom discussion, the judged quality of the students' fieldwork, and the quality of their term papers. *Prerequisites: Comm/Gen 20 and Comm/HIP 100, or a background in general psychology; upper-division standing or consent of instructor.*

**129. The Logic of Perception (4)**  
This course is concerned with how we perceive the world. The lectures will cover three topics: a) the rich tradition of experimental work on perception that dates back to Helmholtz, b) discussion and criticisms of theories of perception including the view that perception is "intelligent" or "logical", c) recent physiological work on the visual pathways that may give us insights into neural mechanisms underlying perception. *Prerequisite: upper-division standing.*

**130. Developmental Psychology and Education (4)**  
An introduction to cognitive development with emphasis on its relation to education. *Prerequisite: enrollment in Teacher Education Program or consent of instructor.*

**133A. Psychology and Artificial Intelligence (4)**  
A survey of artificial intelligence as it pertains to psychology. The course focuses on issues of knowledge representation of importance to artificial intelligence and cognitive science. *Prerequisite: Psych. 105.*

**133B. Psychology and Artificial Intelligence (4)**  
A detailed look at selected computational techniques used in artificial intelligence and cognitive modeling. The course will cover semantic network and frame representations, object-based programming, constraint languages, truth maintenance systems, and parallel distributed processing representation. *Prerequisites: Psych. 133A and knowledge of LISP.*

**134. Psychology of Thinking (4)**  
An introduction to contemporary models of cognition and the process of thinking. *Prerequisite: Psych. 105.* (Not offered in 1987-88.)

**135. Cognitive Engineering (4)**  
Applications of cognitive science emphasizing principles for design of intelligence systems that enhance rather than dominate human life. Topics include: human error (versus system-induced error), knowledge engineering, intelligence computer-assisted instruction, control of complex systems, conversation systems, intention-based systems, moral implications. *Prerequisites: Psych. 105 and either EECS 161A or Psych. 133.*

**136. Cognitive Development: Piaget (4)**  
Intensive examination of Jean Piaget's theories of cognitive growth from birth to adolescence. Topics: development of imagery and mental representation, thought and language, concepts of space, causality and number, logical thinking. *Prerequisite: Psych. 101 or 105.*

**137. Cognition and the Brain (4)**  
An examination of the relationship between higher mental function and neurology in a developmental/adaptive framework. This will include the classical literature on neurological disorders in adults and children. Theories and mechanisms will be discussed in an attempt to elucidate structural and functional relations between cognitive processes and the brain. *Prerequisites: Psych. 105 and 106; concurrent registration permitted.* (Not offered in 1987-88.)

**138. Alcohol and Other Drugs of Addiction (4)**  
This course will consist of guest lectures by experts in various topics concerning drug abuse, ranging from teratology,

neurochemistry, behavioral effects, addictive potential and social impact. (Not offered in 1987-88.)

**139. Brain Damage and the Mind (4)**  
The purpose of the course will be to try and answer some of the following questions: Are cognitive functions sharply localized or diffusely represented in the brain? What are the brain mechanisms which lie at the basis of perception and memory, of speech and thought, of movement and action? What happens to these processes when individual parts of the brain are destroyed by disease.

**143. Emotion (4)**  
Introduction to current theories and research on emotion, with special reference to theories of anxiety. *Prerequisite: Psych. 104 or 105.* (Not offered in 1987-88.)

**145. Psycholinguistics (4)**  
Presentation of the psychology of language, including its biological basis, its development in children, and its use by the adult. Of particular interest will be the question of the relevance of linguistic descriptions to psycholinguistics. *Prerequisites: Comm/HIP 136 (Psych. 105) or Ling. 1 and 2.*

**146. Culture and Thought (4)**  
An examination of the major theories and relevant data concerning the way in which culturally organized experience influences the nature of thinking. Historical records, anthropological field reports and experiments will be examined for the senses in which they are relevant to understanding presumed relations between culture and thought. Particular emphasis will be placed upon the kinds of conclusions that can be supported by different kinds of data, and the shifting meaning of basic terms when one surveys different areas of research on this topic. *Prerequisite: Comm/Cul 100 or Comm/Hip 100, or Comm/Hip 136 (Psych. 105).* (Not offered in 1987-88.)

**147. Social Perception and Cognition (4)**  
How we perceive and judge other persons and ourselves. Focus on experimental analysis of cognitive processes. *Prerequisites: Psych. 104 and 105.* (Not offered in 1987-88.)

**148. Psychology of Judgment and Decision (4)**  
General theory of judgment-decision based on cognitive algebra. Empirical applications across all areas of psychology. *Prerequisites: Psych. 104 and 105.*

**149. Social Psychology and Dramatic Arts (4)**  
This undergraduate seminar will explore the relationship between social psychology and drama, focusing especially on the use of psychological principles in plays (by playwrights) and their performance (by directors, actors, and choreographers). In addition to discussions and student presentations based on assigned readings, there will be videotaping sessions of students' scenework. *Prerequisites: major in psychology, minor in theatre, or major in theatre, minor in psychology or consent of instructor.*

**150. Comparative Psychology (4)**  
Principal emphasis will be on the comparative psychology of learning and ethology. Selected topics such as critical periods and animal communication will be covered. *Prerequisite: Psych. 103 or 106.* (Not offered in 1987-88.)

**151. Control and Analysis of Human Behavior (4)**  
Extensions of learning principles to human behavior. Topics include methods of self-control, applications to clinical disorders, and the design of cultures. *Prerequisite: Psych. 120.* (Not offered in 1987-88.)

**154. Behavior Modification (4)**  
Extension of learning principles to human behavior. In addition to discussion of the broad implications of a behavioral perspective, topics include methods of applied behavior analysis and applications of behavioral principles to clinical disorders and to normal behavior in various settings. *Prerequisites: Psych. 103 and/or Psych. 120.* (Not offered in 1987-88.)

**155. Social Psychology and Medicine (4)**  
Explores areas of health, illness, treatment, and delivery of treatment that may be elucidated by an understanding of psychological concepts and research and considers how the psychological perspective might be enlarged and extended in the medical area. *Prerequisites: Psych. 60 or equivalent and Psych. 104.*

**156. Cognitive Development in Infancy (4)**  
This course examines perception and cognition in the first year of life. The focus is a critical evaluation of different theo-



ries of cognitive change in infancy. Methodological issues will be a central concern. *Prerequisites: Psych. 60 and 101.*

**158. Explorations of Human Nature (4)**

Lecture and discussion on psychological, biological, and social constraints on human psychology, with special emphasis on consciousness and emotion and on topics in the evolution of mind and behavior. *Prerequisite: seniors majoring in psychology, anthropology, or philosophy.*

**159. Physiological Basis of Perception (4)**

A survey of sensory and perceptual phenomena with emphasis on the physiological mechanisms underlying them. *Prerequisite: Psych. 102 or consent of instructor.*

**161. Human Aggressive Behavior (4)**

Influential theories of human aggression will be reviewed in detail. Classical and recent studies in the area will be examined, with an emphasis on methodological and definitional issues. An integrated cognitive-emotional model of interpersonal aggression will be developed. *Prerequisite: Psych. 104 or consent of instructor.* (Not offered in 1987-88.)

**162. Psychology and the Law (4)**

Research dealing with psychological factors in the legal system will be surveyed. Particular emphasis will be placed on applying psychological theory and methods to the criminal justice system in an attempt to understand the behavior of its participants. Such topics as identifying crime and criminals, eye witness reliability, bail setting, plea bargaining, sentencing, and parole will be critically examined in light of current psychological and criminological research. An original research project will be required as part of the course. *Prerequisites: Psych. 60 and 104.*

**163. Abnormal Psychology (4)**

This course is a comprehensive survey of the origins, characteristics, and causes of abnormal behavior. Particular attention is given to the biological and environmental causes of abnormality. (Not offered in 1987-88.)

**165. Explanation and Knowledge (4)**

Discussion of psychological theory and evidence on such topics as epistemology, ordinary language, reasons and causes, existence, sociocultural determinants of thought, ethics. *Prerequisites: restricted to seniors and graduate students in anthropology, linguistics, philosophy, political science, psychology, and sociology; consent of instructor.*

**166. History of Psychology (4)**

Survey of the major trends and personalities in the development of psychological thought. Emphasis will be given to such selected topics as the mind-body problem, nativism vs. empiricism, and the genesis of behaviorism. *Prerequisites: three previous upper-division courses in psychology.*

**167. Social and Emotional Development (4)**

Lecture course focused on the early social development of the child. Will include topics like attachment, moral development, sex roles, self definition, and peer interaction. *Prerequisites: Psych. 60 and 101.*

**168. Psychological Disorders of Childhood (4)**

This course explores different forms of psychological deviance in children, including psychosis, neurosis, mental retardation, language disorders, and other behavior problems. Emphasis is placed on symptomatology, assessment, etiological factors, and various treatment modalities.

**170. Critical Issues in Psychology (4)**

Discussion of selected controversial issues (e.g., nature of intelligence, nature of motivation) from alternative theoretical perspectives. *Prerequisites: restricted to senior psychology majors with consent of instructor.* (Not offered in 1987-88.)

**172. Semantic Theory (4)**

This course examines a number of theories of knowledge representation. It focuses primarily on work from the areas of artificial intelligence and cognitive psychology. (Not offered in 1987-88.)

**173. Literacy, Social Organization, and the Individual (4)**

(Same as Comm/Hip 121.) This course will examine the historical growth of literacy from its earliest precursors in the Near East. The interrelation between literate technology and social organization and the impact of literacy on the individual will be twin foci of the course. Arriving at the modern era, the course will examine such questions as the impediments to teaching, reading, and writing skills to all normal children in technological societies and the relation between literacy

and national development in the Third World. *Prerequisite: Comm/Cul 100 or Comm/HIP 100 or Comm/HIP 136 (Psych. 105).* (Not offered in 1987-88.)

**174. The Psychology of Filmic Text (4)**

(Same as Comm/HIP 143 and Lit/Gen 168.) The course will examine a variety of films using different perspectives and methods of psychology to analyze the types of problems raised by the nature of cinematic communication. Topics will include an introduction to basic elements of cinematography theoretical and technical bases of film's "grammar," perception of moving pictures, the function and status of sound, the influence of film on behavior and culture (and vice versa), the representation of psychological and social interaction, the communication of narrative and spatial information, the generation and translation of film conventions, and the parameters which the medium and the culture impose upon the attempt to express various forms of abstraction in the concrete visual language of film. *Prerequisite: Comm/HIP 100 or consent of instructor.* (Not offered in 1987-88.)

**177. Experimental Psychopathology (4)**

Coverage of theories of psychological disorders based on principles derived from experimental psychology, particularly those from research on conditioning. Topics to be covered are neuroses, psychoses, and addictions. *Prerequisite: either Psych. 14, 103, or 120.* (Not offered in 1987-88.)

**178. Group Protests and Conflict Resolution (4)**

A small seminar (twenty students) with intensive analysis through readings and discussion of the origins, development, and resolution of group conflicts with particular emphasis on the psychological processes involved. (Not offered in 1987-88.)

**179. Drugs, Addiction, and Mental Disorder (4)**

This course will consider the use, abuse, liability, and psychotherapeutic effects of drugs in man. Behavioral effects, tolerance, dependence and toxicity of marijuana, alcohol, cocaine, opiates, psychedelics, and over-the-counter drugs will be explored. Psychotherapeutic drugs are included in lectures on anxiety, sleep disorders, attentional deficit disorder, affective disorders, and schizophrenia. Lectures are supplemented by guest lectures from clinical experts in psychology and psychiatry. *Prerequisite: one lower-division psychology course (Psychology 1, 2, 3, or 4) or one upper-division psychology course; junior standing recommended.*

**182. Children and Media (4)**

(Same as Comm/HIP 123.) A lecture course which analyzes the influence of media on children's behavior and thought processes. The course takes an historical perspective, beginning with children's print literature, and encompasses movies, music, television, and computers. The focus of the course is analytical; students will study specific examples of media products intended for children and apply various analytic techniques including content analysis and experimentation to these materials. *Prerequisite: communication major, upper-division psychology, or consent of instructor.* (Not offered in 1987-88.)

**184. Musical Psychoacoustics (4)**

Survey of psychoacoustical phenomena, theories of hearing and their relation to music perception and cognition. Techniques of psychoacoustical experimentation. *Prerequisites: consent of instructor; Music 104 recommended.*

**194A-B-C. Honors Thesis (4-4-4)**

Research seminars and research, under the direction of a member of the staff. *Prerequisites: one laboratory course in psychology (Psych. 115 through 127), Psych. 111, a 3.0 grade-point average, and consent of instructor.*

**195. Instruction in Psychology (4)**

Introduction to teaching of introductory psychology. Each student will be responsible for and teach a class section in one of the lower-division psychology courses. (P/NP grades only.) *Prerequisites: junior standing and either a) an A in the course in which the student plans to assist, or b) a grade-point average of B or better in no fewer than three upper-division psychology courses. Consent of instructor. Only counts once towards minor or major.*

**196A-B-C. Senior Seminar/Project in Cognitive Science (4-4-4)**

The course is designed to provide students with the basic research tools of cognitive science and to give them practical experience using those tools. The first term will emphasize tools. Students will be given instruction in model building from both a psychological and artificial intelligence perspec-

tive. In the remaining two terms students will carry out specific individual projects under the supervision of the instructor and the staff. *Prerequisite: restricted to seniors majoring in the cognitive science specialty of psychology.* (Not offered in 1987-88.)

**198. Directed Group Study in Psychology (2)**

Group study under the direction of a faculty member in the Department of Psychology. *Prerequisite: Psychology 101, 102, 103, or 105.*

**199. Independent Study (2-4)**

Independent study or research under direction of a member of the staff. Not counted for credit towards the major. *Prerequisite: special permission of department.* (P/NP grades only.)

**Graduate**

**201A-B. Quantitative Methods in Psychology (3-3)**

An intensive course in statistical methods and the mathematical treatment of data, with special reference to research in psychology. *Prerequisite: restricted to graduate students in psychology.*

**202. Sensory Mechanisms (4)**

A survey of current problems in the analysis of sensory systems.

**203. Physiological Psychology (3)**

The central nervous system and its relation to behavior.

**204. Social Psychology (3)**

The behavior of man as a function of social variables.

**205. Cognitive Engineering (3)**

Applied information processing psychology, emphasizing human-machine interaction. Development of formal principles of design based upon cognitive science. Topics include: principles of human-machine interaction, human and system-induced error, "friendly" systems, Mental Models and System Images, moral implications, including the question of what tasks ought not to be fully automated.

**206. Conditioning and Learning (3)**

Classical and operant conditioning in lower animals.

**207. Principles of Behavior (3)**

Basic seminar on behavior theory with emphasis on principles of conditioning as the foundation of a general model of behavior.

**208. Topics in Behavior Modification (3)**

Seminar in applied behavior analysis and behavior modification. Topics will include discussion of current, methodological issues and techniques, recent literature content areas, and legal/ethical issues. *Prerequisite: course background in operant conditioning and/or behavior modification.* (Not offered in 1987-88.)

**209A. Judgment and Decision Making (3)**

General theory of judgment and decision. Psychophysical judgment, social judgment, decision making, and rudiments of measurement theory. Primary emphasis on experimental applications. *Prerequisite: open to undergraduates with consent of instructor.* (Not offered in 1987-88.)

**209B. Judgment and Decision Making (3)**

General theory of judgment and decision. Primary emphasis on mathematical and statistical analysis of algebraic models, both for controlled experiments, and for observational field data. *Prerequisite: Psych. 209A.* (Not offered in 1987-88.)

**210. Motivation and Learning (3)**

Basic seminar on principles of human and animal motivation and learning. (Not offered in 1987-88.)

**211. Piagetian Theory (3)**

Selected topics in Piaget's theory of cognitive development. (Not offered in 1987-88.)

**212A-B-C. Introduction to Visual Science I, II, & III (3-3-3)**

Specification and measurement of the visual stimulus; introductions to basic physiological optics and visual neurophysiology. *Prerequisites: 212A; open to undergraduates with Psych. 159, 212B; open to undergraduates with Psych. 212A, 212C open to undergraduates with 212A and 212B.*

**213. Systematic Issues in Psychology (4)**

Selected historical and current topics will be discussed from competing theoretical perspectives.

## PSYCHOLOGY

### 214. Alcohol and Its Problems (4)

The physiological actions of alcohol on the body; medical implications. Animal research on alcoholism. The relative importance of the environmental and genetic factors in alcoholism. Behavioral change due to alcohol intake. Alcohol consumption and interaction in small groups and society at large. *Prerequisite: undergraduates with consent of instructor.* (Not offered in 1987-88.)

### 215. Language Acquisition (4)

Discussion of the acquisition of language by young children, including such topics as its stages, mechanisms, and relation to non-linguistic development. *Prerequisite: consent of instructor.*

### 216. Basic Seminar in Comparative Cognitive Research (3)

This seminar will review current research and theory in cognitive psychology, in order to characterize group differences in cognitive functioning. Groups chosen are assumed to be not equivalent in theoretically important ways that affect their performance on standard laboratory tasks.

### 217. Cognitive Development in Infancy (3)

The course focuses on cognitive development in infancy, beginning with an examination of early neurological, sensory, motor and perceptual functions, and extending to issues in the origins of concept and symbol formation.

### 218A-B. Cognitive Psychology (3-3)

A two-quarter survey of basic principles and concepts of cognitive psychology. This course is intended to serve as the basic introduction for first-year students. Basic areas include knowledge, memory, thought, perception, and performance. The areas are taught by those faculty members who work within the specialty. *Prerequisite: graduate status in psychology or consent of instructor.*

### 219. Proseminar in Learning and Motivation (3)

An overview of the experimental and applied analysis of behavior including topics such as the principles of operant and classical conditioning, stimulus control, choice, conditioned reinforcement, aversive control, biological and economic contexts, verbal behavior, and the modification of human behavior in a variety of applied settings.

### 220. Proseminar in Social Psychology (3)

An introduction to social psychology. Psychology and the law, health psychology, attitudes, emotion, person perception and aggression are some of the topics to be covered.

### 221A. Sensory and Physiological Psychology I (3)

Fundamental of vision, audition, and other senses. Emphasis will be upon psychophysical approaches to the study of these sensory modalities, as well as some essential aspects of their neurophysiological bases.

### 221B. Sensory and Physiological Psychology II (3)

Physiological mechanisms underlying vision, hunger and thirst, and the physiological bases of memory and learning.

### 222. Brain Functions (2)

Selected topics. Advanced seminar.

### 223. Advanced Topics in Vision (4)

An in-depth analysis of empirical and theoretical issues in a specialized area of vision or visual perception. Emphasis most likely will be on a topic of ongoing vision research at UCSD. *Prerequisite: Psych. 212A or special consent of instructor.*

### 224. Experimental Analysis (3)

Graduate level course aimed at practical problems of experimental analysis and substantive interpretation of data. Covers an array of topics: problems of control and confounding single-subject design and analysis; comparisons between different subject groups; measurement of change and importance; choice of dependent variable; experimentation in naturalistic settings; presentation of data and writing reports; selecting a research problem. *Prerequisites: Psych. 201A-B.*

### 225. Experimental Analysis of Behavior (2)

Advanced seminar in modern techniques and findings, with special emphasis on operant conditioning and lower animals. (Not offered in 1987-88.)

### 226. Contemporary Problems in Vision (2)

Survey seminar on recent work in physiological optics, vision research, and the visual process. (Not offered in 1987-88.)

### 227. Cognitive Development (4)

Selected topics with emphasis on current experimental work. *Prerequisite: consent of instructor.*

### 228A. Theoretical Methods in Psychology (4)

An introduction to the methodology of model building and theory development in psychology. Topics to be covered include the techniques from: stochastic modeling, computer simulations, decision theory, and scaling. (Not offered in 1987-88.)

### 228B-C. Theoretical Methods in Psychology (4-4)

Seminar on methods for building mathematical and computer simulation models in learning, memory, perception, and sensory processes. (Not offered in 1987-88.)

### 229. Selected Topics in Social Psychology (2)

Advanced seminar in theoretical issues in attitudes and social perception with special attention to current research. (Not offered in 1987-88.)

### 230. Neural Models of Cognitive Processes (3)

Examination of models of cognitive processes which attempt to understand aspects of cognition in terms of interactions among populations of simple information-processing elements such as neurons. Format will be in-depth discussions of theoretical articles. *Prerequisites: exposure to linear algebra and differential equations; consent of instructor.* (Not offered in 1987-88.)

### 231. Advanced Topics in Human Information Processing (2)

Selected discussions of advanced topics. *Prerequisite: Psych. 205 or consent of instructor.* (Not offered in 1987-88.)

### 232. Advanced Topics in Human Social Behavior (3)

The course will cover topics in human social behavior, with special emphasis on recent developments in experimental and social psychology. Such topics as aggression, affiliation, and the relationship between self-reports and other behavior will be examined. *Prerequisite: consent of instructor.*

### 233A-B. Topics in Learning and Motivation (3-3)

Advanced topics in learning and motivation, with special emphasis on current research. *Prerequisite: Psych. 210.*

### 234. Cognitive Development (2)

Nature and function of perception and judgment from a development point of view. (Not offered in 1987-88.)

### 235. Models in Sensory Psychology (3)

Models of information processing in sensory systems will be discussed. Physiological evidence and mathematical formalization will frequently be used. (Not offered in 1987-88.)

### 236. Animals Discrimination Learning (3)

Intensive examination of problems in the study of discrimination learning. (Not offered in 1987-88.)

### 237. Methods and Topics in Experimental Social Psychology (3)

An advanced seminar dealing with the laboratory and field methods of experimental social psychology and topics such as aggression, altruistic behavior, conformity, and bystander intervention. Students will be encouraged to engage in field experimentation. (Not offered in 1987-88.)

### 238. Seminar on Visual Information Processing (3)

The course will focus on experimental studies of higher level visual processing, emphasizing research on visual memory systems and on the functional locus of attentional selectivity in vision. Current work on picture and scene perception will be reviewed. The relationship between visual processes and spatial representation will also be reviewed.

### 239. The Development and Modification of Sensory Systems (3)

This course will emphasize experimental evidence and working models relating to the development of the sensory systems, especially vision and audition. The processing of complex stimuli and the underlying physiological mechanisms will be studied. (Not offered in 1987-88.)

### 241A-B-C. Advanced Topics in Cognition (4-4-4)

Research and discussion on selected topics in cognitive psychology. May be taken by undergraduate senior majors concurrently enrolled in Psychology 194. (S/U grades permitted.)

### 242A-B-C. Research Topics in Developmental Psychology (4-4-4)

Advanced seminar concentrating on methods of research and current experimental literature. May be taken by undergraduate senior majors concurrently enrolled in Psychology 194. *Prerequisite: consent of instructor.* (S/U grades permitted.)

### 244. Special Topics in Psycholinguistics (4)

Discussion of the psychological reality of grammatical models, competence versus performance, learnability and innateness in theories of language acquisition, and questions of autonomy or "modularity" of grammatical versus semantic processing. Studies of lexical accessing, sentence comprehension, sentence production, and acquisition will all be considered, as well as some recent work in aphasia.

### 245. Advanced Topics in Psycholinguistics (3)

Research and discussion on selected topics in psycholinguistics. *Prerequisite: consent of instructor.*

### 246A-B-C. Exploration in Cognition (3-3-3)

Research seminar in advanced topics in the study of cognition. *Prerequisites: restricted to students in the CSL research group; others should request consent of the instructor, advanced knowledge of modern concepts of human information processing.* (S/U grades.)

### 248. Semantic Theory (4)

An introduction to the fields of semantics and pragmatics. Material from linguistics, philosophy, and artificial intelligence will be related to current developments in psychology and psycholinguistics. *Prerequisite: consent of instructor.* (S/U grades permitted.) (Not offered in 1987-88.)

### 249A-B-C. Advanced Topics in Applied Behavior Analysis (3-3-3)

Research and discussion on selected topics in applied behavior analysis.

### 251. Advanced Topics in Learning and Motivation (3)

Weekly meetings for graduate students actively engaged in research on conditioning. *Prerequisite: consent of instructor.*

### 252. Seminar on Cognitive Neuroscience (3)

This is a series of weekly seminars on current trends in neuropsychology. The seminars will deal with the concept of "localization" of function in different parts of the brain and the effects of damage to these parts on cognitive functions such as perception, memory and language. Active student participation will be encouraged in preparing these seminars.

### 253. Advanced Topics in Social Perception and Cognition (3)

Research and discussion on selected topics in cognitive psychology. *Prerequisite: consent of instructor.*

### 254. Advanced Topics in Perception (3)

Research and discussion on selected topics in perception. *Prerequisite: consent of instructor.* (Not offered in 1987-88.)

### 255. Advanced Topics in Physiological Psychology (3)

Research and discussion on selected topics in physiological psychology. *Prerequisite: consent of instructor.* (Not offered in 1987-88.)

### 257. Advanced Topics on the Analysis of Behavior (3)

Research and discussion on selected topics in the analysis of behavior. *Prerequisite: consent of instructor.* (Not offered in 1987-88.)

### 259A-B-C. Advanced Seminar in Comparative Cognitive Research (3-3-3)

Advanced topics in comparative, cognitive research.

### 260. Advanced Topics (2)

Advanced seminar on special topics in theoretical and experimental psychology. *Prerequisite: graduate student in psychology.*

**261. Topics in the History of Psychology (3)**

The seminar will cover the development of concepts and methods in psychology, particularly during the nineteenth and twentieth centuries. Particular emphasis will be placed on the precursors of currently active areas of research and theory and on the historical and social contexts for these developments. *Prerequisites: completion of first year of graduate work in psychology or consent of instructor.*

**262. Emotion: Theories and Evidence (3)**

A critical examination of current theories of human emotion from the point of view of contemporary cognitive psychology. Discussion of behavior and physiological research in the light of different theoretical positions. *Prerequisite: second-year graduate standing in psychology or consent of instructor.* (Not offered in 1987-88.)

**263. Psychopharmacology (3)**

This course will explore the basic neuropharmacological mechanism of action of the major classes of drugs, including neuroleptics, stimulants, anti-depressants, minor and major tranquilizers, and sedative hypnotics. It will focus on the use of behavioral techniques for evaluating the neural mechanisms by which these drugs act.

**264. Special Topics in Social Cognition (3)**

Seminar on current theory and research on social perception, memory for social events and people, and attribution theory. Open to graduates and advanced undergraduates. *Prerequisite: open to undergraduates with Psych. 147 or by consent of instructor.* (Not offered in 1987-88.)

**265. Psychology and Medicine (3)**

Concentrates on what psychology has to contribute to the understanding of illness, its treatment, and the social context in which these processes occur. Topics: Psychological factors in the etiology and treatment of illness, doctor-patient roles, and communication. *Prerequisites: open to undergraduates with Psych. 126 or Psych. 127 and consent of instructor.*

**267A-B-C. Advanced Topics in Social Cognition (3-3-3)**

Research and discussion on selected topics in social cognition.

**270A-B-C. Introduction to Laboratory Experimentation (1-4)**

A basic laboratory course, designed to introduce first-year graduate students to experimental methods in psychology. The student will select a research topic, do a thorough literature review of the area, design and carry out new, original studies of problems in the selected area, and prepare a final formal report of the study at the end of the spring quarter. This course is required of all first-year graduate students in the department. *Prerequisite: first-year psychology graduate students only.*

**271. Neuropsychology: Principles of Brain and Behavior (4)**

A survey of brain-behavior relationships drawing principally from the study of man and non-human primates. Topics to be covered include evolution of intelligence, hemispheric relations, language, memory, perception, and motivation. Emphasis will be on student presentations and discussion.

**280. Seminar in Communication and Information Research (1)**

(S/U grades only.)

**281A-B-C. Topics in Human Information Processing (1-1-1)**

Weekly seminar on advanced topics in the contemporary literature on information processing. *Prerequisite: Psych. 270C.*

**296. Research Practicum (1-12)**

Research in psychology under supervision of individual staff members. (S/U grades permitted.) (F,W,S)

**298. Library Research (1-1)**

Reports and surveys of the literature on selected topics. *Prerequisite: graduate students in psychology.* (F,W,S)

**299. Independent Research (1-12)**

Independent research and thesis research. (S/U grades permitted.) (F,W,S)

**500. Apprentice Teaching (4)**

Required teaching practicum for students enrolled in graduate program in psychology. One four-unit course per year for four years. (S/U grades only.)

**REVELLE HONORS PROGRAM**

OFFICE: Office of the Provost,  
Revelle College

Revelle stresses recognition of success at UCSD. Special certificates are awarded to students who make the Provost's Honors List. The college annually recognizes its top one hundred students with a student-faculty awards banquet. Outstanding students are individually advised to participate in small honors classes where available (chemistry, physics, mathematics). Seniors are selected for participation in an honors seminar, Revelle 100, and may be selected to be an honor student mentor for a sophomore. At least five outstanding graduating seniors are honored at graduation each year with a monetary honorarium.

**Revelle 100. Senior Honors Seminar: Science and Civilization (4)**

Beginning with the distinction between science and technology, the course will trace their evolution from earliest times, culminating in an examination of their impact on modern society and of the social concerns about their future course. Course may be taken P/N only. *Prerequisites: senior standing, 3.5 overall GPA, science major, consent of instructor, Revelle students only.* (S)

**RUSSIAN AND SOVIET STUDIES PROGRAM**

OFFICE: 7039 Humanities and Social Sciences Building, Muir College

**Faculty:**

Steven Casedy, Ph.D. (*Associate Professor in Literature*)

Frantisek Deak, Ph.D. (*Associate Professor in Theatre*)

Robert Edelman, Ph.D. (*Associate Professor in History*)

Beth Holmgren (*Assistant Professor in Literature*)

Timothy McDaniel, Ph.D. (*Associate Professor in Sociology*)

**The Minor**

Russian and Soviet studies is an interdisciplinary minor which provides a broad range of courses in the history, language, literature, and social and political life of Russia (both pre- and post-revolutionary) and the present-day Soviet Union. The minor consists of six courses, at least three of which must be upper-division. In addition, there must be at least one course

from two of the three general areas of literature, history, and social science, and no more than three of the six courses can be in the language. Knowledge of the language is not a requirement for the minor, but is of course strongly recommended. A minor in Russian and Soviet studies will give a general background in this vitally important area of the world to interested students and will also provide a foundation for graduate studies in the related fields.

**Courses offered:****Linguistics**

Ling/Ru 31, 32, 33 First-year conversation (2-2-2)  
Ling/Ru 51, 52, 53 First-year analysis of Russian (2-2-2)  
Ling/Ru 34, 35, 36 Second-year conversation (2-2-2)  
Ling/Ru 54, 55, 56 Second-year analysis of Russian (2-2-2)

**Literature**

Lit/Ru 101 A-B-C Introduction to Russian Literature (4-4-4)  
Lit/Ru 140A-B Survey of Russian Literature (4-4)  
Lit/Ru 141 Soviet Literature (4)  
Lit/Ru 142 Genres in Russian Literature (4)  
Lit/Ru 143 Single Authors in Russian Literature (4)  
Lit/Ru 198 Directed Group Study (4)  
Lit/Ru 199 Special Studies (2 or 4)

**Theatre**

Theatre 168 History of the Russian Theatre (4)

**History**

History 110A-B Russian History (4-4)  
History 110Q Special Topics in Modern Russian History (4)  
History 171 Early Soviet Social History (4)  
History 173A History of Arms Control Negotiations (4)

**Social Science**

Poli. Sci. 130AA-AB Soviet Politics (4-4)  
Sociology 188E Soviet Society (4)

**SCIENCE, TECHNOLOGY AND PUBLIC AFFAIRS**

OFFICE: Second floor, Building 517,  
Matthews Administrative and Academic Complex

**Professors:**

Herbert F. York, Ph.D. (*Physics*) (*Program Director*)

Hannes Alfvén, Ph.D. (*ECE*)

James R. Arnold, Ph.D. (*Chemistry*)

Clifford Grobstein, Ph.D. (*Biological Science and Public Policy*)

Sanford A. Lakoff, Ph.D. (*Political Science*)

## SCIENCE, TECHNOLOGY, AND PUBLIC AFFAIRS

Stanford S. Penner, Ph.D. (AMES)  
Roger R. Revelle, Ph.D. (Science and Public Policy)  
Harold J. Simon, M.D. (Community Medicine)

### Associate Professor:

Georgios H. Anagnostopoulos, Ph.D. (Philosophy)

### Assistant Professor:

John M. Mendeloff, Ph.D. (Political Science)

\* \* \*

Harold Brown, Ph.D. (Research Associate)  
G. Allen Greb, Ph.D. (Assistant Research Historian/Adjunct Lecturer)  
Gerald W. Johnson, Ph.D. (Adjunct Professor)  
James M. Skelly, Ph.D. (Assistant Research Sociologist/Adjunct Lecturer)  
Frederick T. Wall, Ph.D. (Adjunct Professor)

The program offers an opportunity to study the important social policy issues that lie at the intersection of science, technology, and decision making and to develop awareness of the social and political factors that condition technology on the social order. The program will be attractive to students anticipating careers in law, administrative sciences, science, engineering, business, and international affairs. The program will serve as a meeting place for those interested in approaching policy questions from the perspective of the physical and biological sciences and for those in the social sciences having an interest in the scientific and technological component of present social, political, and environment problems.

### The Minor Program

The Science, Technology and Public Affairs (STPA) minor consists of six courses chosen from the following lists. Of these six, at least four must be from the list of STPA courses, and not more than two of those four should be given by the same instructor. Two of the six courses may be chosen from the list of related courses in other departments and programs. Students' specific plans for completing the minor should be approved by the program office no later than early in the junior year.

## Courses

### Lower Division

#### 13. Human Nutrition (4)

(Same as Biology 13.) A survey of our understanding of the basic chemistry and biology of human nutrition; discussions

of all aspects of food: nutritional value, production, distribution, cultural aspects. Discussion of human health, public health, and public policy. Three hours of lecture and one hour of discussion. *Prerequisite: Biol. 10 or equivalent.* This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. Staff

#### 20. Knowledge and Society: The Problem of Nuclear War (4)

(Same as Political Science 20.) The aim of this course is to investigate the problems posed by nuclear weapons in terms of the interaction of different forms of knowledge — scientific, technological, political, and ethical. Topics will include the military use of scientific knowledge, the analysis of international conflict and strategy, and diplomatic efforts to control the nuclear arms race. S. Lakoff

#### 35. Society and the Sea (4)

(Same as AMES 35.) Selected topics including living and nonliving resources, seaports and sea travel, the frail sea, the wild sea, military oceanology, legal, economic and social aspects, coastal zone management, scientific research. The sea and weather.

#### 69. Computers and Society (4)

(Same as CSE 69.) An introduction to computers, their applications, and their impact on people and social institutions. Factual and technical information for making objective judgments about computer use. Social problems created by the use of computers and tools for solving them. Constructive and creative thought about technology and its social impact. The course has no prerequisites.

## Upper-Division Core Courses

#### 105C. Technology and Society (4)

(Same as Political Science 162AC and Biology 183.) Policy issues raised by biomedical-scientific advances. The topical content varies from year to year. Included are such areas as intervention in human heredity and development, regulatory policy with respect to cancer and human population problems. Emphasis is on mechanisms for interaction of scientific expertise and other perspectives in policy making. C. Grobstein, R. Revelle

#### 107. Technology and Human Values (4)

(Same as Philosophy 125.) Traditional ideas of nature and the rise of science and technology. The influence of the rise of science and technology on political ideals, on human life, on freedom, on education, and on welfare. G. Anagnostopoulos

#### 119A. Energy: Demands, Resources, Impact, Technology, and Policy (4)

(Same as Frontiers of Science 119A and AMES 119A.) Past and estimated future energy demands. Renewable and non-renewable energy resources. Economic impact of energy use. Environmental impact of energy use. Energy conservation in manufacturing, transportation, home use. Energy policy. AMES and physics faculty

#### 119B. Energy: Nonnuclear Energy Technologies (4)

(Same as Frontiers of Science 119B and AMES 119B.) Oil recovery from tar sands and oil shale. Coal production, gasification, liquefaction. The hydrogen economy. Energy-storage systems. Techniques for direct energy conversion. Solar energy utilization. Energy from windmills. Tidal and wave energy utilization. Hydroelectric power generation. Hydrothermal energy. Geothermal energy from hot rocks. Electrical power production, transmission, and distribution. *Prerequisite: consent of instructor.*

#### 119C. Energy: Nuclear Energy Technologies (4)

(Same as Frontiers of Science 119C and AMES 119C.) A brief survey of energy demands and resources. Available nuclear energy. Physical background — thermal dynamics — atomic and nuclear physics — fission and fusion processes. Physics of fission reactions — engineering aspects — safety and environmental effects. Fusion, scaling laws, and start-up criteria — laser fusion. Magnetic confinement — Equilibrium instability. *Prerequisite: consent of instructor.*

#### 124A. Introduction to Policy Analysis (4)

(Same as Political Science 160AA.) In this course students will conduct analyses of public policy problems and decide which policy alternatives should be adopted. The problems will be drawn from fields including energy, the environment, health, and the law enforcement. The purposes of this

course are three-fold: to foster an appreciation of the complexity of policy problems; to teach methods for thinking about how to design better policies; and to convey some of the specific tools that analysts and policy makers often use. J. Mendeloff

#### 124B. Introduction to Policy Analysis (4)

(Same as Political Science 160AB.) This course will emphasize the political and organizational problems of designing and implementing public policies. Students will carry out several analyses of policies. *Prerequisite: STPA 124A or Political Science 160AA.* J. Mendeloff

#### 142C. Seminar in American National Security Policy (4)

(Same as Political Science 142C.) Seminar in selected national security topics. Special emphasis will be placed on current U.S. military posture and arms control policies, and the rationales behind them. Other topics will include the strategic balance, the NATO/Warsaw Pact confrontations, the Middle East, SALT, and other arms control forums. *Prerequisites: STPA 105B/Pol. Sci. 105B or STPA 170/Pol. Sci. 142B.* H. York

#### 145. Nuclear Weapons and American Society, 1945-1983 (4)

(Same as Sociology 145.) The course analyzes the growth of a nuclear weapons culture in the United States and its impact upon key social institutions, including the military, science, the economy, Congress, and the electorate. Developments in national security policy, nuclear strategy, weapons production, and arms control will be discussed from this institutional perspective. C. Nathanson

#### 157. Technology and the Poor Countries (4)

This course treats the gap between the rich and the poor countries and the role of technology in bridging this gap. Special attention will be given to the sources of global poverty and to the importance of increased agricultural productivity and the role of the advanced countries. *Prerequisites: upper-division standing and consent of instructor* R. Revelle

#### 161. Marine Policy (4)

(Same as Political Science 166D.) This course aims to provide a theoretical and factual framework for the study of marine policy and to examine several cases involving controversial issues. Among the issues: the porpoise-tuna controversy; manganese nodules and deep-sea mining; coastal management and nuclear power; and liability for oil spills. R. Revelle

#### STPA 163A. History of Arms Control Negotiations (4)

(Same as Political Science 163AA and History 173A.) A lecture-discussion course dealing with the history and process of international arms control negotiations in the nuclear age. Focus will be on the evolution of U.S. and Soviet nuclear weapons policies and efforts to control the superpower arms race. Topics will include the strategic balance, history of strategic concepts, weapons technology, the legacy of pre-World War II arms diplomacy, nuclear test ban negotiations, and SALT/START. Students who have taken STPA 105B or Poli. Sci. 162AB will not be allowed to take this course for credit. *Prerequisite: upper-division standing.* G. Allen Greb

#### STPA 163B. Start Simulation (4)

(Same as Political Science 163AB and History 173B.) A ten-week simulation of the U.S.-Soviet Strategic Arms Reduction Talks (START). Students will assume the roles of U.S. and Soviet governmental actors and will attempt to negotiate a START agreement. *Prerequisites: STPA 105B or 163A; Poli. Sci. 162AB or 163AA; History 173A and consent of instructor.* G. Allen Greb

#### STPA 176. The Politics of Medicine and Health (4)

(Same as Political Science 164A.) This course will examine how government has acted to change the medical care system and protect public health. Problems of regulating doctors, evaluating new technologies, controlling costs, and improving health insurance will be examined. Do those issues have anything to do with reducing illness and death? J. Mendeloff

#### STPA 177. The Politics of Environmental Health and Safety Regulations (4)

(Same as Political Science 164B.) This course will examine the theory and practice of U.S. health and safety regulation with an emphasis on assessing how well it is working. Environmental carcinogens will get special attention. *Prerequisite: upper-division standing or consent of instructor.* J. Mendeloff



**180. Senior Seminar in Biomedical Science and Public Policy Analysis (4)**

(Same as Biology 184.) Readings and discussion of requirements for effective utilization of biomedical science in public policy analysis with examples drawn from biostandardization (radiation, carcinogenicity, toxicity), bioethics (life support, human experimentation), biological engineering, research policy, etc.) *Prerequisites: senior or graduate standing and consent of instructor.* C. Grobstein

**181. Elements of International Medicine (4)**

The sociocultural, economic, and geo political framework for the study and understanding of medical problems on a worldwide scale, and as basis for international health policy. Global patterns of disease, availability and needs for medical technology, and comparisons between diverse medical education and health care delivery systems abroad with those in the U.S. Students should be able to acquire an understanding of diverse determinants of disease, and of relationships between socioeconomic development and health. *Prerequisite: senior or graduate standing.* H. Simon

**199. Special Project (2 or 4)**

Directed study on topics in science, technology and public affairs; especially for Warren College students. (P/NP grades only.) *Prerequisite: senior standing.* H. York, C. Grobstein, R. Revelle

**Related Courses**

Courses in other departments and programs (change somewhat from year to year):

- Communication/SF 128
- Economics 130
- Political Science 166B
- Sociology 116
- Sociology 168

**SCRIPPS INSTITUTION OF OCEANOGRAPHY**

OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

**Professors:**

- Gustaf Arrhenius, Ph.D. (*Oceanography*)
- George E. Backus, Ph.D. (*Geophysics*)
- Jeffrey L. Bada, Ph.D. (*Marine Chemistry*)
- Andrew A. Benson, Ph.D. (*Biology*)
- Wolfgang H. Berger, Ph.D. (*Oceanography*)
- James N. Brune, Ph.D. (*Geophysics*)
- Charles S. Cox, Ph.D. (*Oceanography*)
- Harmon Craig, Ph.D. (*Geochemistry and Oceanography*)
- Joseph R. Curray, Ph.D. (*Marine Geology*)
- Russ E. Davis, Ph.D. (*Oceanography*)
- Paul K. Dayton, Ph.D. (*Oceanography*)
- LeRoy M. Dorman, Ph.D. (*Geophysics, and Chairman of the Department*)
- James T. Enright, Ph.D. (*Behavioral Physiology*)
- D. John Faulkner, Ph.D. (*Marine Chemistry*)

- Edward A. Frieman, Ph.D. (*Physics, Vice Chancellor of Marine Sciences and Director of Scripps Institution of Oceanography*)
- Carl H. Gibson, Ph.D. (*Engineering Physics and Oceanography*)
- Joris M. T. M. Gieskes, Ph.D. (*Oceanography*)
- J. Freeman Gilbert, Ph.D. (*Geophysics*)
- Edward D. Goldberg, Ph.D. (*Chemistry*)
- Harold T. Hammel, Ph.D. (*Physiology*)
- James W. Hawkins, Ph.D. (*Geology*)
- Francis T. Haxo, Ph.D. (*Biology*)
- Walter F. Heiligenberg, Ph.D. (*Behavioral Physiology*)
- Myrl C. Hendershott, Ph.D. (*Oceanography*)
- Robert R. Hessler, Ph.D. (*Biological Oceanography*)
- Nicholas D. Holland, Ph.D. (*Marine Biology*)
- Douglas L. Inman, Ph.D. (*Oceanography*)
- Miriam Kastner, Ph.D. (*Geology*)
- Charles D. Keeling, Ph.D. (*Oceanography*)
- Devendra Lal, Ph.D. (*Nuclear Geophysics*)
- Ralph A. Lewin, Ph.D., Sc.D. (*Biology*)
- J. Douglas Macdougall, Ph.D. (*Earth Sciences*)
- John A. McGowan, Ph.D. (*Oceanography*)
- Michael M. Mullin, Ph.D. (*Oceanography*)
- Walter H. Munk, Ph.D. (*Oceanography*)
- William A. Newman, Ph.D. (*Oceanography and Vice Chairman of the Department*)
- Pearn P. Niiler, Ph.D. (*Oceanography*)
- John A. Orcutt, Ph.D. (*Geophysics*)
- Robert L. Parker, Ph.D. (*Geophysics*)
- Joseph L. Reid, M.S. (*Oceanography*)
- Richard H. Rosenblatt, Ph.D. (*Marine Biology*)
- George G. Shor, Jr., Ph.D., (*Marine Geophysics*)
- George N. Somero, Ph.D. (*Biology*)
- Richard C. J. Somerville, Ph.D. (*Meteorology*)
- Fred N. Spiess, Ph.D. (*Oceanography*)
- Victor D. Vacquier, Ph.D. (*Marine Biology*)
- Charles W. Van Atta, Ph.D. (*Engineering Physics and Oceanography*)
- Kenneth M. Watson, Ph.D. (*Physical Oceanography*)
- Ray F. Weiss, Ph.D. (*Geochemistry*)
- Clinton D. Winant, Ph.D. (*Oceanography*)
- Edward L. Winterer, Ph.D. (*Geology*)
- Robert S. Arthur, Ph.D. (*Oceanography, Emeritus*)
- Seibert Q. Duntley, Sc.D. (*Physics, Emeritus*)
- Albert E. J. Engel, Ph.D. (*Geology, Emeritus*)

- Richard A. Haubrich, Ph.D. (*Geophysics, Emeritus*)
- William A. Nierenberg, Ph.D. (*Geophysics, Director, Emeritus*)
- Fred B Phleger, Ph.D. (*Oceanography, Emeritus*)
- Russell W. Raitt, Ph.D. (*Geophysics, Emeritus*)
- Roger R. Revelle, Ph.D. (*Oceanography, Emeritus*)
- Victor Vacquier, M.A. (*Geophysics, Emeritus*)
- Benjamin E. Volcani, Ph.D. (*Microbiology, Emeritus*)
- Claude E. ZoBell, Ph.D. (*Marine Microbiology, Emeritus*)

**Associate Professors:**

- Laurence Armi, Ph.D. (*Oceanography*)
- Robert T. Guza, Ph.D. (*Oceanography*)
- William S. Hodgkiss, Ph.D. (*Electrical Engineering*)
- T. Guy Masters, Ph.D. (*Geophysics*)
- Melvin N. A. Peterson, Ph.D. (*Oceanography*)
- Robert Pinkel, Ph.D. (*Oceanography*)
- Richard L. Salmon, Ph.D. (*Oceanography*)

**Assistant Professors:**

- Horst Felbeck, Dr. rer. nat. (*Marine Biology*)
- Margo G. Haygood, Ph.D. (*Marine Biology*)
- George Sugihara, Ph.D. (*Mathematical Ecology*)
- Lynne D. Talley, Ph.D. (*Oceanography*)
- Lisa Tauxe, Ph.D. (*Geophysics*)

**Professor-in-Residence:**

- William H. Fenical, Ph.D. (*Chemistry*)

**Adjunct Professors:**

- Mark R. Abbott, Ph.D. (*Oceanography*)
- Alan D. Chave, Ph.D. (*Geophysics*)
- Douglas P. DeMaster, Ph.D. (*Oceanography*)
- John R. Hunter, Ph.D. (*Marine Biology*)
- Reuben Lasker, Ph.D. (*Marine Biology*)
- Alec D. MacCall, Ph.D. (*Oceanography*)
- William F. Perrin, Ph.D. (*Marine Biology*)
- Michael R. Silverman, Ph.D. (*Biology*)
- Robert H. Stewart, Ph.D. (*Oceanography*)
- Hans R. Thierstein, Ph.D. (*Geology*)

**Senior Lecturers:**

- Farooq Azam, Ph.D. (*Research Biologist*)
- Yaacov K. Bentor, Ph.D. (*Research Geologist*)
- Jonathan Berger, Ph.D. (*Research Geophysicist*)
- Angelo F. Carlucci, Ph.D. (*Research Microbiologist*)
- Richard W. Eppley, Ph.D. (*Research Biologist*)
- William Evans, Ph.D.



## SCRIPPS INSTITUTION OF OCEANOGRAPHY

- Abraham Fleminger, Ph.D. (*Research Biologist*)  
Jeffrey B. Graham, Ph.D. (*Research Biologist*)  
Edvard A. Hemmingsen, Ph.D. (*Research Physiologist*)  
Osmund Holm-Hansen, Ph.D. (*Research Biologist*)  
Robert A. Knox, Ph.D. (*Research Oceanographer*)  
Gerald L. Kooyman, Ph.D. (*Research Biologist*)  
Peter F. Lonsdale, Ph.D. (*Research Geologist*)  
William R. Riedel, D.Sc. (*Research Geologist*)  
Richard J. Seymour, Ph.D. (*Research Engineer*)  
Kenneth L. Smith, Jr., Ph.D. (*Research Biologist*)  
Elizabeth L. Venrick, Ph.D. (*Research Biologist*)  
A. Aristides Yayanos, Ph.D. (*Research Biologist*)

### Lecturers:

- Duncan C. Agnew, Ph.D. (*Associate Research Geophysicist*)  
John G. Anderson, Ph.D. (*Associate Research Geophysicist*)  
Andrew G. Dickson, Ph.D. (*Assistant Research Chemist*)  
Richard N. Hey, Ph.D. (*Associate Research Geophysicist*)  
Mark E. Huntley, Ph.D. (*Assistant Research Biologist*)  
Richard A. Jahnke, Ph.D. (*Assistant Research Geochemist*)  
Russell D. Vetter, Ph.D. (*Assistant Research Biologist*)  
Peter F. Worcester, Ph.D. (*Associate Research Oceanographer*)  
Mark A. Zumberge, Ph.D. (*Assistant Research Geophysicist*)

### Affiliated Faculty:

- Victor C. Anderson, Ph.D. (*Professor, ECE*)  
Hassan Aref, Ph.D. (*Associate Professor, AMES*)  
James R. Arnold, Ph.D. (*Professor, Chemistry*)  
Theodore H. Bullock, Ph.D. (*Professor, Neurosciences*)  
John W. Miles, Ph.D. (*Professor Emeritus, AMES*)  
Fred N. White, Ph.D. (*Professor, Medicine*)

The graduate department of the Scripps Institution of Oceanography offers graduate instruction leading to M.S. and Ph.D. degrees in oceanography, in marine biology, and in earth sciences.

Emphasis is on the Ph.D. program. A student's work normally will be concentrated in one of several curricular programs within the department. These programs include biological oceanography, marine biology, marine chemistry, geological sciences, geophysics, physical oceanography, and applied ocean sciences.

No undergraduate major is offered in the department though most courses in the department are open to enrollment for qualified undergraduate students with the consent of the instructor. The interdisciplinary nature of research in marine and earth sciences is emphasized; students are encouraged to take courses in several programs and departments, and to select research problems of interdisciplinary character. The research vessels and other facilities of the Scripps Institution and its associated laboratories (including the Institute of Geophysics and Planetary Physics) are available to department students, many of whom participate in oceanographic research at sea.

## The Curricular Programs

**Biological Oceanography** is the field of study concerned with the interactions of populations of marine organisms with one another and with their physical and chemical environment. Since these interactions are frequently complex, and since the concepts and techniques used in investigating the environment and the populations are drawn from many fields, biological oceanography is, of necessity, interdisciplinary. Therefore, studies in physical oceanography, marine chemistry, and marine geology, as well as biology, are pertinent. Research activities in this curriculum include studies of the factors influencing primary and secondary productivity and nutrient regeneration, fishery biology and management, community ecology of benthic and pelagic forms, population dynamics, habitat changes and disruption, systematics, evolution, biogeography, behavior as it affects distribution, and sampling problems. Theoretical, experimental, and direct observational approaches to these problem areas are conducted.

**Marine Biology** is the study of marine organisms, their development, and their adaptations. It is, therefore, concerned with the physiological and biochemical processes in marine organisms, their genetic relationships, and the relationship between them and their environment, both biotic, and physical. It encompasses several major areas of modern biology,

and is interpreted from the viewpoints gained through understanding the physical and chemical dynamics of the seas. Research activities of faculty members in the curriculum currently include microbiology, ultra-structure, photobiology, barobiology, cardiovascular physiology, comparative biochemistry, comparative and cellular physiology, neurophysiology and behavior, ecology, developmental biology, and distribution and evolution of marine animals and plants.

**Marine Chemistry** is concerned with chemical processes operating within the marine environment: the oceans, the marine atmosphere, and the sea floor. The interactions of the components of seawater with the atmosphere, with the sedimentary solid phases, and with plants and animals form the basis for research programs. These include: investigations of the carbon system, marine natural products, chemical interactions between marine organisms, physical and inorganic chemistry of sediment water systems, organic chemistry in the marine environment, distribution of noble gases in seawater, and trace metal chemistry of seawater and sediments.

**Geological Sciences** emphasizes the application of observational, experimental, and theoretical methods of the basic sciences to the understanding of the solid earth, ocean, atmosphere, and the solar system. Principal subprograms at Scripps are marine geology, petrology, and geochemistry. Expedition work at sea and field work on land are emphasized as an essential complement to laboratory and theoretical studies. Marine geology is the field of study concerned with the origin, properties, and history of ocean basins and with the geological processes that affect them. Research areas include tectonics and volcanism; geomorphology, structure, and deformation of the oceanic crust and continental margins, utilizing both geophysical and geological techniques; deep sea and continental margin sedimentation, stratigraphy, and paleoclimatology; and beach and nearshore processes. Petrology concerns the origin and history of the rock complexes of the earth's crust and upper mantle, with emphasis on the igneous, metamorphic, and sedimentary rocks of the ocean basins and their margins, the characteristics and interrelations of the oceanic and continental crust, and studies of lunar and meteoritic materials. The geochemistry program is designed for students with undergraduate majors in either geology or chemistry.

Areas of advanced study and research include the geochemistry of the ocean, the atmosphere, and the solid earth, nuclear geochemistry, circulation and mixing of oceanic water masses based on carbon, oxygen, carbon-14, radium, radon, stable isotopes, and rare gases, studies of volcanic and geothermal phenomena, the interaction of sediments with seawater and interstitial waters, geochemical cycles, and the history and composition of the ocean and sedimentary rocks.

**Geophysics** emphasizes the application of general principles of mathematics and experimental physics to fundamental problems of the oceans, oceanic crust and deep interior of the earth. Research interests of the group include: observational and theoretical studies of electric and magnetic fields in the oceans and on the land; theoretical seismology with special emphasis on the free oscillations of the earth; long-period observational seismology; ocean-bottom seismology; earthquake source mechanisms and strong motions of the ground; the measurements of slow crustal deformations; geophysical inverse theory; magnetohydrodynamics of the core of the earth; geophysical instrumentation particularly in the marine environment; acoustic propagation in the oceans.

**Physical Oceanography** is the field of study that deals with mechanisms of energy transfer through the sea and across its boundaries, and with the physical interactions of the sea with its surroundings, especially including the influence of the seas on the climate of the atmosphere. Research activities within this curricular group are both observational and theoretical and include: study of the general circulation of the oceans, including the relations of ocean currents to driving forces and constraints of the ocean basins; fluctuations of currents, and the transport of properties; the mechanisms of transport of energy, momentum, and physical substances within the sea and across its boundaries; properties of wind waves, internal waves, tsunami and planetary waves; the thermodynamic description of the sea as a system not in equilibrium; optical and acoustic properties of the sea; and the influence of surf on near-shore currents and the transport of sediments.

**Applied Ocean Sciences** is an interdepartmental program concerned with man's purposeful and useful intervention into the sea. The program combines the interests of faculty members of the

Scripps Graduate Department, the Department of Applied Mechanics and Engineering Sciences, and the Department of Electrical Engineering and Computer Sciences to produce oceanographers who are knowledgeable of modern engineering and engineers who know about the oceans. Instruction and research are not restricted to structural, mechanical, material, electrical, and physiological problems of operating within the ocean but include the applied environmental science of the sea as well. Since physical, chemical, geological, and biological aspects of the oceans and all forms of engineering may be involved, the curriculum provides maximum flexibility in meeting the needs of each individual student. Present research activities within the curricular group include studies of: deep circulation and deep fish populations; deep-sea autonomous vehicles, instruments, basic control devices, and special collecting gear; seismic surveys of the mantle; ocean bottom microseisms and crustal displacements associated with earthquakes; surveys of bathymetric-magnetic trends; design and construction of special purpose ocean vehicles (ships, submarines, platforms such as FLIP); remotely operated cable-connected vehicles and stations on the sea floor; sonar systems and sonar signal processing equipment; underwater lasers; remote sensing of sea-surface temperature, roughness, and marine resources from aircraft and orbital spacecraft; meteorology above the oceans; turbulent flows, formation of barrier beaches; mechanisms of currents, sand transport, and sediment transport in the surf zone, the shelf, and in submarine canyons; studies of air-sea interaction.

### Requirements for Admission

Candidates for admission should have a bachelor's or master's degree in one of the physical, biological, or earth sciences; in some cases a degree in mathematics or engineering science is accepted. The student's preparation should include:

1. Mathematics through differential and integral calculus.
2. Physics, one year with laboratory (the course should stress the fundamentals of mechanics, electricity, magnetism, optics and thermodynamics, and should use calculus in its exposition).
3. Chemistry, one year with laboratory.
4. An additional year of physics or chemistry.

5. Preparation in at least one foreign language chosen from the following: German, Russian, a Romance language.
6. Applicants for admission are required to submit scores on the verbal and quantitative tests of the Graduate Record Examinations given by the Educational Testing Service of Princeton, New Jersey.

Specific additional requirements for admission to the various curricular programs are as follows:

Biological oceanography — two years of chemistry, including general and organic chemistry (physical chemistry requiring calculus may be substituted for physics requiring calculus where a more elementary physics course was taken); and a year of general biology (or zoology, or botany). Normal preparation should also include a course in general geology and at least one course in the following three categories: systematics (e.g., invertebrate zoology), population biology (e.g., ecology), functional biology (e.g., embryology). In special cases other advanced courses in mathematics or natural sciences may be substituted for one or more of the above.

Marine biology — a major in one of the biological sciences (or equivalent), with basic course work in botany, microbiology, or zoology; two years of chemistry, including organic (biochemistry and physical chemistry will be expected of students in experimental biology, although the student may, if necessary, enroll in these courses after admission). Training in one or more of the following areas is strongly recommended: cellular biology, molecular biology, comparative physiology, genetics, developmental biology, ecology, comparative anatomy, vertebrate and invertebrate zoology, microbiology, and botany. A strong scholastic record in a narrower biological field may be considered in lieu of breadth of background.

Marine chemistry — major in chemistry, biochemistry, or related field.

Geological sciences — major in one of the earth sciences or physical or inorganic chemistry. Physical chemistry and calculus are required, and preparation beyond the minimum requirements in mathematics, physics, and chemistry is strongly recommended.

Geophysics — major in physics or mathematics, or equivalent training.

Physical oceanography — major in a physical science, including three years of physics and mathematics.

## SCRIPPS INSTITUTION OF OCEANOGRAPHY

Applied ocean sciences — major in physical science or engineering science, including three years of physics or applicable engineering and three years of mathematics at college level.

Candidates with preparation different from that given above can be admitted only if their undergraduate or previous graduate record has been outstanding. It is possible to make up most shortcomings in preparation with courses available at UCSD.

### Programs of Study

Because of limited facilities, the department does not encourage students who wish to proceed only to the M.S. If circumstances warrant, the degree is normally offered under Plan II (comprehensive examination) after completion of course work established by the department.

Thesis Plan I: A course of study must include forty-eight units of credit. Of the forty-eight units, twenty-four units in graduate courses, including at least sixteen units in graduate-level courses in the major field; sixteen additional units in graduate or upper-division courses; and eight units in research work leading to the thesis.

Comprehensive Examination Plan II: A course of study must include forty-eight units of credit. Of the forty-eight units, thirty-two units in graduate courses, including at least twenty units in graduate-level courses in the major field; and sixteen additional units in graduate or upper-division courses.

The program of study for the Ph.D. degree is determined in consultation with the student's adviser (after the first year, the chairperson of the student's guidance or doctoral committee). General requirements of the curricular groups are as follows:

#### Biological Oceanography

The student will be expected to be familiar with the material presented in the following courses: SIO 210A, 240, 260, 270, 275C, 276A, 280, one of 284, 289, 274, or 294A, and Math. 285. Other course work ordinarily will be recommended by the student's advisory committee, usually including 278 (or equivalent) one quarter of each year and at least one advanced-level course in physical, chemical, or geological oceanography. Participation in an oceanographic cruise (minimum of two weeks' duration) is required.

#### Marine Biology

Entering graduate students will be encouraged to gain a varied research experience in several laboratories during their first year. In the spring term of their first year at SIO, students will take the departmental examination, at which time they will be expected to demonstrate competence in general biology and in the material covered in the following courses: SIO 210A, 240, 260, 280, as well as any other course work recommended by the advisory committee. All students are expected to enroll and actively participate in a seminar course during two quarters of each year.

#### Marine Chemistry

Students in the curriculum will be expected to take courses within the areas of physical and biological oceanography and marine geology or marine biology, as well as courses in the Department of Chemistry, which will be assigned according to personal needs after consultation with a faculty adviser.

#### Geological Science

The geological sciences curricular group offers programs leading to the Ph.D. either in earth sciences or oceanography. The only general requirement is responsibility for material offered in Essentials of Geology (SIO 248A-B-C). The "basic" courses (SIO 210A, 260, and 280) are considered essential for the oceanography degree. Some, or all, of these courses will normally be taken by candidates for the earth sciences degree. Other courses in oceanography and related areas will be selected and scheduled depending on the student's background and interests. In some cases a student's program may include course work in selected subject areas given at other campuses. Normally students will take a comprehensive department examination near the end of their third quarter of residence. The doctoral qualifying examination will be given during the second year of residence. There are no additional language requirements beyond the general department admission requirement of one year of college-level study in a modern foreign language useful in the student's studies.

#### Geophysics

There is no single course of study appropriate to the geophysics curriculum; instead, the individual interests of the student will permit, in consultation with the adviser, a choice of course work in seismology, geomagnetism, etc. Every stu-

dent, however, will be required to have knowledge of one or more of the ocean sciences. In the winter quarter of the second year of residence each student will be given an oral departmental examination, which is intended to cover the student's formal training. A brief presentation of possible research interests will also be expected at this exam. There is no formal language requirement.

#### Physical Oceanography

Students in this curricular program will be expected to have satisfied the departmental admission requirement of preparation in at least one important foreign language and to demonstrate proficiency in the subjects treated by the following courses: SIO 210A, 211A-B, 212A-B, 214, 221, AMES 105A-B-C or AMES 294A-B-C, one of SIO 240, 260, or 280 plus two additional SIO courses selected with approval by the student adviser.

#### Applied Ocean Sciences

Students must: (a) take or demonstrate their knowledge of the following basic courses: SIO 210A, 240, 260, 280, and Math. 210A-B-C or AMES 294A-B-C, and (b) attend the Applied Ocean Sciences Seminar (SIO 208) throughout their period of enrollment. Additional course requirements for a field of emphasis in a complementary discipline will be established to meet the needs and interests of each individual student by the advisory committee.

#### Language Requirements

The department has no formal language requirements. Graduate students are expected to have satisfied the entrance requirement of preparation in at least one important foreign language. Within the department, curricular programs may require demonstration of ability to use certain foreign languages pertinent to a student's research. All students must be proficient in English.

#### Departmental and Qualifying Examinations

Doctoral candidates normally will be required to take a departmental examination not later than early in the second year of study. The examination will be primarily oral, although written parts may be included. The student will be required to demonstrate in quantitative and analytical manner comprehension of required subject material and of the pertinent interactions of physical, chemical, biological, or geological factors.

After the student has passed the departmental examination, and has completed an appropriate period of additional study, the department will recommend appointment of a doctoral committee. This committee will determine the student's qualifications for independent research, normally by means of a qualifying examination late in the second year of study or early in the third year, and will supervise the student's performance and reporting of his or her research.

The nature of the qualifying examination varies between curricular groups. In biological oceanography, marine biology, geological sciences, physical oceanography, and applied ocean sciences, the student will be expected to describe his or her proposed thesis research and satisfy the committee, in an oral examination, as to mastery of this and related topics. In marine chemistry, the student will be expected to present, in an oral examination, both a major and a minor proposition. The major proposition will consist of a statement of an original research problem or scientific idea within his or her area of interest. The student should be prepared to discuss the theory and experimental techniques that may be involved, the significance of the proposition, and its relationship to previous knowledge. The minor proposition should consist of a discussion of the student's thesis research. In geophysics, the student presents an original research problem, in the form of a written proposition, to the candidacy committee. The student's oral presentation and defense of this proposition completes the examination.

## Dissertation

A requirement for the Ph.D. degree is the submission of a dissertation and a final examination in which the thesis is publicly defended. We encourage students to publish appropriate parts of their theses in the scientific literature. In some cases, individual chapters are published as research articles prior to completion of the entire thesis.

## Special Financial Aids

In addition to teaching and research assistantships, fellowships, traineeships and other awards available on a campus-wide competitive basis, the department has available a certain number of fellowships and research assistantships supported from research grants and contracts, or from industrial contributions.

## Courses

### Upper Division

#### 198. Directed Group Study (2-4)

Directed group study on a topic or in a field not included in the regular department curricula, by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor. Staff (F,W,S)

#### 199. Special Studies (2 or 4)

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor.

### Graduate

#### 207A. Digital Signal Processing I (4)

Sampling; A/D and D/A conversion, discrete linear system theory, z-transforms; digital filters, recursive and nonrecursive designs, quantization effects; fast Fourier transforms, windowing, high speed correlation and convoluting; discrete random signals; finite word length effects. *Prerequisites:* EECS 152A-B-C or equivalent. (S/U grades permitted.) Hodgkiss (F)

#### 207B. Digital Signal Processing II (4)

Power spectrum estimation; homomorphic signal processing; applications to: speech, radar/sonar, picture, biomedical, and geophysical data processing. *Prerequisite:* SIO 207A or consent of instructor. (S/U grades permitted.) Hodgkiss (W)

#### 207C. Digital Signal Processing III (4)

Single and multichannel data processing in a time varying environment; adaptive filters; high resolution spectral estimation; linear prediction; adaptive beamforming. *Prerequisites:* SIO 207A-B or consent of instructor. (S/U grades permitted.) Hodgkiss (S)

#### 208. Seminar in Applied Ocean Sciences (1)

Topics in applied ocean sciences. One hour seminar. (S/U grades only.) Staff (F,W,S)

#### 209. Special Topics (1-4)

Within the next few years, lectures on various special subjects will be offered by members of the staff. The emphasis will be on topics that reveal the interdependence of the biological, chemical, geological, and physical processes operating in the oceans. (S/U grades permitted.) Staff (F,W,S)

#### 210A. Physical Oceanography (4)

Physical description of the sea; physical properties of seawater, methods and measurements, boundary processes, regional oceanography. *Prerequisites:* the mathematics and physics required for admission to the graduate curriculum in the Scripps Institution of Oceanography (see text), or consent of instructor. Hendershott, Reid (F)

#### 210B. Physical Oceanography (4)

Introduction to mechanics of fluids on a rotating earth; transport and boundary-layer phenomena, turbulent flow, and wave motion; emphasis on application to biological, chemical, and geological oceanography. *Prerequisites:* SIO 210A and consent of instructor. (S/U grades permitted.) Cox (F)

#### 211A-B. Ocean Waves (4-4)

Propagation and dynamics of waves in the ocean including the effects of stratification, rotation, topography, wind, and nonlinearity. *Prerequisites:* SIO 210A, 214. Hendershott, Pinkel, Guza (W,S)

#### 212A-B. Dynamical Oceanography (4-4)

The equations of motion for rotating stratified flow and their application to large-scale ocean dynamics; the wind-driven circulation, flow over topography, and the dynamics of two-layer models. *Prerequisite:* SIO 214 or consent of instructor. Salmon, Hendershott (F)

#### 213. Ocean Turbulence and Mixing (4)

Mixing mechanisms, their identification, description and modeling. Introduction to turbulence, description and modeling, importance of coherent structures, effects of stratification and rotation on turbulent structure, entrainment and mixing. (S/U grades permitted.) Armi (S)

#### 214. Introduction to Fluid Mechanics (4)

A survey of classical problems in fluid mechanics and approximate techniques of analysis. Topics include conservation equations, straight laminar flows, low and high Reynolds number laminar flow, stability of laminar flows, turbulent flow. *Prerequisite:* partial differential equations. Winant (F)

#### 215A-B. Experimental Ocean Physics (5-5)

A lecture and laboratory course designed to present experimental aspects of physical measurements at sea and in general methods of fluid mechanics. Students will conceive, design, and conduct experiments; interpret and present written results. *Prerequisite:* SIO 214 or consent of instructors. Cox, Winant (S,F)

#### 216A. Physics of Sediment Transport (4)

Mechanics and energetics of sediment transport by water, wind, waves, and density flows. Types of flow systems, mechanics of granular and fluid media, their interactions and transport relations; and the generation and formation of bed forms under waves and currents. Lectures, laboratory, and demonstration sessions. *Prerequisite:* consent of instructors; SIO 214, 211A recommended. Inman, Guza (W)

#### 216B. Nearshore Processes (4)

Application of the mechanics of wind, wave, and sediment transport to the nearshore environment and to the formation of sedimentary structures and beaches. Fluid mechanics of the surf zone; generation of longshore and rip currents, surf beat, nonlinear waves. *Prerequisite:* SIO 211A or 214 or 216A. Guza, Inman (S)

#### 217. Numerical Methods in Geophysical Fluid Dynamics (4)

Useful numerical methods of simulating the large-scale dynamics of oceans and atmospheres: fundamental concepts, classification of problems, introduction to discrete variable methods, stability, convergence, error analysis, elementary properties of finite-difference schemes, implicit methods, spectral methods, nonlinear problems. (Offered in odd-numbered years.) (S/U grades permitted.) Somerville (F)

#### 218. Dynamic Meteorology (4)

Thermodynamic and statics of dry and moist air, equations of motion, scale analysis, elementary applications and wave solutions; thermal convection and laboratory analogues to atmospheric motions; predictability theory; atmospheric general circulation and energetics; theoretical models for weather forecasting and climate simulation. (Offered in even-numbered years.) (S/U grades permitted.) Somerville (F)

#### 219. Special Topics in Physical Oceanography (1-4)

Example topics are case histories and methods in physical oceanography, theories of the ocean circulation, numerical methods in large-scale ocean and atmospheric models, and natural electromagnetic phenomena in the earth and the oceans. (S/U grades permitted.) Staff (F,W,S)

#### 220. Topics in Geophysical Continuum Mechanics (4)

Mathematical foundations, physical limitations and selected geophysical applications of continuum mechanics. Topics may include finite strain; thermodynamics of stress-strain relations; phenomenology and mechanisms of dissipation; continuum theory of dislocations; and generation and propagation of elastic waves in a nearly homogeneous medium. *Prerequisites:* differential and integral calculus, differential equations, linear algebra. Backus (F)

#### 221. Analysis of Physical Oceanographic Data (4)

Techniques for analysis of physical oceanographic data involving many simultaneous processes including probability densities, sampling errors, spectral analysis, empirical orthogonal functions, correlation, linear estimation, objective mapping. *Prerequisite:* consent of instructor. (S/U grades permitted.) Davis (W)

#### 222. Tensors in Geophysics (4)

Tensors as geometrical objects rather than arrays of components. Applications, depending on class background, chosen from among plate tectonics, earth rotation, tides, geomagnetism, continuum mechanics (stress, strain, constitutive relations, dislocations), seismic source theory, flow in porous media. *Prerequisite:* consent of instructor. (S/U grades permitted.) Backus (F)

#### 223. Geophysical Data Analysis (4)

Design of geophysical experiments and analysis of geophysical measurements, interpretation of geophysical time series; sampling, least squares, spectrum analysis. Staff (W)



## SCRIPPS INSTITUTION OF OCEANOGRAPHY

- 224. Internal Constitution of the Earth (4)**  
An examination of current knowledge about the composition and state of the earth's interior revealed by geophysical observations. Seismic velocity and mass density distributions; equations of state; phase changes; energy balance and temperatures; constraints on composition from extraterrestrial samples and exposed rocks; spherical and aspherical variations of properties. *Prerequisites: calculus and differential equations, basic chemistry and physics, or consent of instructor.* Staff (S)
- 226A. Introduction to Marine Geophysics I (4)**  
Methods of geophysical investigations in the ocean, with emphasis on seismic and acoustic methods. Includes discussion of instrumentation, field methods, data processing, interpretation, assumptions, limitations. Critical discussion of "state of the art" and current results. The course is intended primarily for geologists and geophysicists. *Prerequisites: calculus, differential equations, classical physics, at least one geology course, or consent of instructor.* Shor (W)
- 226B. Introduction to Marine Geophysics II (4)**  
Methods of geophysical investigations in the ocean, with emphasis on gravity, magnetic, and geothermal methods. Includes discussion of instrumentation, field methods, data processing, interpretation, assumptions, and limitations. Critical discussion of "state of the art" and current results. The course is intended primarily for geologists and geophysicists. *Prerequisites: calculus, differential equations, classical physics, at least one course in geology, or consent of instructor.* Dorman (S)
- 227A-B-C. Seismology (4-4-4)**  
Equation of motion, exact transient solution of canonical problems, interface pulses, geometrical diffraction theory, ray theory and mode theory in plane-layer media, free oscillations of the earth, radiation from moving sources, source determination, aeolotropic and heterogeneous media, dissipation, interpretation problems. *Prerequisite: consent of instructor.* Gilbert (F,W,S)
- 229. Geomagnetism (4)**  
Survey of the application of electromagnetic theory to the solid earth, the main geomagnetic field, the dynamo model of its source, implications of the dynamo theory, induction by external variations, the electrical conductivity inverse problem and its solution, electromagnetic anomalies, induction in simple bodies, induction in the oceans, magnetotelluric theory. *Prerequisites: advanced calculus, differential equations, complex variables, and familiarity with Maxwell's equations, or consent of instructor.* Parker (S)
- 230A. Introduction to Inverse Theory (4)**  
Elementary functional analysis to Hilbert Spaces. Solution of linear inverse problems by norm and semi-norm minimization. Resolution; inference; norms other than 2-norm. *Prerequisite: consent of instructor.* (S/U grades permitted.) Parker (W)
- 230B. Introduction to Inverse Theory (4)**  
Nonlinear problems by linearization. Exact solution of certain nonlinear problems. *Prerequisite: SIO 230A.* (S/U grades permitted.) Parker (S)
- 231A. Seismological Methods — Determination of Earth Structure (4)**  
This course covers seismic methods and applications based mainly on geometric ray theory and simple dispersion theory. Topics include reflection, refraction, and dispersion in laterally homogeneous media, the use of layered models and methods of dealing with lateral inhomogeneities and attenuation. *Prerequisite: differential equations.* (S/U grades permitted.) Brune, Dorman (F)
- 231B. Seismological Methods (4)**  
Basic instrumentation, seismic noise, spectral analysis, basic elasticity for seismology, earthquake mechanism, earthquake hazard, strong motion, energy and moment, earthquake prediction, seismotectonics. (S/U grades permitted.) Brune (F,W,S)
- 232. Interpretation of Seismograms (4)**  
This course will deal with the principles and practice in the interpretation of seismograms. A variety of projects involving the analysis of seismograms will be assigned. *Prerequisite: consent of instructor.* Brune(S)
- 233. Seminar on Essentials of Geophysics (4)**  
This course is intended to cover the essentials of solid-earth geophysics in a qualitative manner, but in greater detail than can be expected in an undergraduate course; the course will be based upon the text of Bott. To give students experience in presenting ideas in public the format of the class will be one in which individual students take responsibility for certain chapters of the text. (S/U grades permitted.) Parker (F)
- 239. Special Topics in Geophysics (1-4)**  
Special course offerings by staff and visiting scientists. Example topics are seismic source theory, geophysical prospecting methods, dislocation theory and seismic mechanisms, tectonic interpretation of geodetic data, and dynamo theory. (S/U grades permitted.) Staff (F,W,S)
- 240. Marine Geology (4)**  
Introduction to the geomorphology, sedimentation, stratigraphy, vulcanism, structural geology, tectonics, and geological history of the oceans. *Prerequisites: the physics and chemistry required for admission to the graduate curriculum in SIO, and ES 101 or equivalent, or consent of instructor.* Staff (W)
- 241A. Continental Margins (4)**  
Quaternary sediments, environments of deposition, and sedimentary processes of the continental margin, including the shore zone, continental shelf, continental slope, sedimentary basins, and base-of-slope environments. *Prerequisite: undergraduate degree in geology or consent of instructor.* (S/U grades permitted.) Curray (F)
- 241B. Continental Margins (4)**  
Structure, sedimentary facies, tectonics, origin, and geological history of passive (intraplate) continental margins. Offered in alternate years. *Prerequisite: undergraduate degree in geology or consent of instructor.* (S/U grades permitted.) Curray (S)
- 241C. Continental Margins (4)**  
Structure, sedimentary facies, tectonics, processes, and geological history of active (plate-edge) continental margins. Offered in alternate years. *Prerequisite: undergraduate degree in geology, or consent of instructor.* (S/U grades permitted.) Curray (S)
- 242. Inorganic Geochemistry (4)**  
An introductory course in inorganic geochemistry for graduate students. Topics covered include bulk compositions of earth and planets; geochemical behavior and fractionation of the elements; trace elements and isotopes in igneous processes; modeling and theoretical studies. Offered in alternate years. *Prerequisite: SIO entrance requirements or consent of instructor.* (S/U grades permitted.) Macdougall (S)
- 243A. Marine Stratigraphy (4)**  
Principles of stratigraphy as applied to marine environments. *Prerequisite: SIO 240 or consent of instructor.* (S/U grades permitted.) Winterer (F)
- 244. Seminar in Sedimentary Petrology (4)**  
Discussions of current research in sedimentary mineralogy, geochemistry, and petrology. The subject(s) will vary from year to year. (S/U grades permitted.) Kastner (W)
- 245A. Sedimentary Petrology (4)**  
Characteristics and origin of sediments and sedimentary rocks. *Prerequisite: consent of instructor.* Winterer (W)
- 245B. Sedimentary Geochemistry and Mineralogy (4)**  
Principles of chemical sedimentology; structure and composition of sedimentary minerals; mineral assemblages in sediments; reaction mechanisms in sediments and their geochemical applications; stable isotopes and diagenesis. *Prerequisites: consent of instructor; mineralogy, geochemistry, sedimentary petrology, and physical chemistry are recommended.* Kastner (F)
- 246. Paleooceanography/Paleoclimatology (4)**  
Principles and methods of paleoceanographic and paleoclimatic research; evolution and ecology of marine microorganisms; history of oceanic sedimentation; isotopic geochemistry of calcareous microfossils; oceans and global climate in glaciated and non-glaciated times. *Prerequisite: consent of instructor.* (S/U grades permitted.) Berger (W)
- 248A. Essentials of Geology (4)**  
A rigorous, synoptic review designed for entering graduate students in geological sciences. Crust and upper mantle, plate tectonics, spreading centers, late interiors, convergent margins. *Prerequisite: bachelor's degree in geology or earth sciences or consent of instructor.* (S/U grades permitted.) Staff (F)
- 248B. Essentials of Geology (4)**  
A rigorous, synoptic review designed for entering graduate students in geological sciences. Magmatic systems, isotope and trace element geochemistry, igneous and metamorphic rocks. *Prerequisite: bachelor's degree in geology or earth sciences or consent of instructor.* (S/U grades permitted.) Staff (W)
- 248C. Essentials of Geology (4)**  
A rigorous, synoptic review designed for entering graduate students in geological sciences. Geochemical cycles in atmosphere, hydrosphere and biosphere, chemical processes at water interfaces, mechanics and patterns of sedimentation, principles of stratigraphy. *Prerequisite: bachelor's degree in geology or earth sciences or consent of instructor.* (S/U grades permitted.) Staff (S)
- 249. Special Topics in Marine Geology (1-4)**  
Special course offerings by staff and visiting scientists. (S/U grades permitted.) Staff (F,W,S)
- 250. Coastal Marine Geochemistry (4)**  
A survey of chemical reactions in estuaries, lagoons, and coastal marine waters. Fundamentals of river and ocean water chemistries. Coastal sedimentation processes. Geochronologies applicable to inshore systems. Goldberg (W)
- 251. Thermodynamics of Natural Processes (4)**  
Applications of thermodynamics to general problems in the earth sciences. Topics include chemical and phase equilibria in heterogeneous multicomponent systems; properties of substances at high temperatures and pressures; models for solid solutions and gaseous mixtures; phase equilibria in silicate melts; adiabatic and pseudo-adiabatic transport; steady-flow systems; closed and open system models of the atmosphere, oceans, and solid earth. *Prerequisites: Chem. 102A or 202A, or Phys. 140, Math. 2D or equivalent.* Craig (W)
- 252A. Nuclear Geochemistry (4)**  
Geochemistry of stable and radioactive isotopes, with emphasis on oceanic and atmospheric applications. Topics include mixing and circulation studies in the ocean, atmosphere-sea interaction, the carbon cycle, volcanic contributions to the atmosphere and ocean, isotope fractionation effects and stable isotope variations in minerals and rocks. *Prerequisites: Mathematics 2D or equivalent, SIO 210A.* (S/U grades permitted.) Craig (W)
- 252B. Nuclear Geophysics and Oceanography (4)**  
A comprehensive course on a variety of nuclear studies in geophysics and oceanography. Nuclear mechanisms including cosmic ray interactions, their rates and geophysical models will be discussed. *Prerequisite: consent of instructor.* Lal (S)
- 252C. Nuclear Geology (4)**  
Radioactive and stable isotope studies in geology; geochronology; implications of isotope data for magma genesis; isotopic evolution of crust and mantle. Offered in alternate years. *Prerequisite: SIO entrance requirements or consent of instructor.* (S/U grades permitted.) Macdougall (S)
- 253. Igneous and Metamorphic Petrology (4)**  
Physical, chemical, and mineralogical properties of igneous and metamorphic rocks. Emphasis is on the origin and genetic relationships as interpreted from field occurrences, theoretical studies, and experimental data. *Prerequisite: physical geology; geochemistry, mineralogy, physical chemistry (may be taken concurrently).* Hawkins (F)
- 254. Advanced Igneous Petrology (4)**  
The origin and evolution of igneous rocks is considered in terms of field and laboratory evidence. Experimental and theoretical studies bearing on igneous processes are discussed and evaluated in the light of geologic occurrences. Special emphasis is given to igneous rocks of the ocean basins and their margins. Typical rock types are analyzed in the laboratory, and their history is interpreted. *Prerequisite: consent of instructor.* Hawkins (S)
- 255. Crustal Evolution (4)**  
The properties, origin, and evolution of the rocks in the earth's crust. *Prerequisite: one-year of graduate study in Scripps Institution of Oceanography or consent of instructor.* Staff (W)



**256A. Field Geology (4)**

Geologic mapping of selected areas and preparation of geological reports. Field work is done on weekends in local areas. *Prerequisites: consent of instructor; to be taken concurrently with SIO 256L.* (S/U grades permitted.) Winterer (W)

**256B. Earth Sciences Spring Field Trip (1)**

Classical areas of the southwestern United States, such as the Colorado Plateau, Mojave Desert, Sierra Nevada and the Peninsular Range, are examined in successive years during six-day field trips. Normally required of all first- and second-year graduate students in marine geology. (S/U grades only.) Staff (S)

**256L. Laboratory Exercises in Field Geology (2)**

Principles of stratigraphy and structural geology applicable to field geologic studies. Discussion and laboratory exercises. *Prerequisites: consent of instructor; to be taken concurrently with SIO 256A.* (S/U grades permitted.) Winterer (W)

**257. Seminar in Petrology (4)**

Discussion of current research in petrology and mineralogy. (S/U grades permitted.) Hawkins (W)

**258. Seminar in Geology (4)**

Discussions of current research in geology not treated in the general course. (S/U grades permitted.) Staff (F,W,S)

**259. Atmospheric Geochemistry (4)**

Topics in this introductory course include: composition and chemical state of the atmosphere, basic thermodynamics and open systems, water and gas exchange with the ocean, isotope geochemistry of atmospheric gases, trace gases (CH<sub>4</sub>, N<sub>2</sub>O, etc.), rates of increase, and climatic effects, early history and chemistry of the atmosphere, introduction to photochemistry. (S/U grades only.) Craig (W)

**260. Marine Chemistry (4)**

Chemical description of the sea; the distribution of chemical species in the world oceans, and their relationships to physical, biological, and geological processes. Gieskes (F)

**261. Physical Chemistry of Seawater (4)**

The consideration of seawater as an electrolyte solution with emphasis upon its structure and physical-chemical properties. Thermodynamic considerations of mixed electrolyte solutions with particular reference to seawater. *Prerequisite: Chem. 202A.* Gieskes (S)

**262. Seminar in Marine Natural Products (1)**

Students will give seminars on current research topics in marine natural products chemistry. *Prerequisite: consent of instructors.* (S/U grades only.) Faulkner, Fenical (F,W,S)

**263. Major Chemical Cycles in the Sea (4)**

The distribution of chemical species in the world oceans and their relation to physical and biological processes, with emphasis on transport and exchange. Keeling (S)

**264. Solids in Nature (4)**

Experimental and theoretical evaluation of geologically important properties of solids. Characteristic differences between solid types, electronic structure of solids, microscopic significance of thermodynamic concepts. Interaction between matter and radiation, structure of geologically important crystals and glasses, order and disorder. Band structure of solids, excited states, the dynamic of phase change. Conductivity, magnetic, and optical properties of solids with particular consideration of geological systems. *Prerequisite: consent of instructor.* Arrhenius (W)

**265. Marine Natural Products Chemistry (4)**

An outline of the organic chemicals from marine organisms with special reference to their function in the marine environment. The differences between terrestrial and marine natural products will be stressed. *Prerequisite: basic organic chemistry.* Faulkner, Fenical (W)

**266. Geochemistry of Organic Compounds (4)**

Distribution, sources, and stability of organic compounds in the geological environment. Major emphasis will be on the synthesis of organic compounds on the primitive earth; organic material in ancient rocks and sediments; and the cycle of organic material in the sea. *Prerequisite: organic chemistry; (biochemistry recommended).* Bada (S)

**268. Seminar in Marine Chemistry (1)**

Discussion of topics related to the chemistry of the marine environment not treated in general courses. (S/U grades permitted.) Bada (W)

**269. Special Topics in Marine Chemistry (1-4)**

Special course offerings by staff and visiting scientists. (S/U grades permitted.) Staff (F,W,S)

**270. Pelagic Ecology (4)**

An analysis of the concepts and theories used to explain the biological events observed in the ocean. Emphasis on plankton. Alternate years. *Prerequisite: SIO 210A, 280, or consent of instructors.* McGowan, Mullin (W)

**271. Biological Oceanographic Techniques (4)**

An introduction to some shipboard techniques and tools in biological oceanography and related physical and chemical measurements. Enrollment limited to ten. Alternate years. *Prerequisites: SIO 280 and 210A or consent of instructor.* (S/U grades only.) Mullin (S)

**272. Biogeography (3)**

A lecture course concerning the origin, development, and perpetuation of distributional patterns with emphasis on benthic marine organisms. Newman (W)

**273. The Evolution of Invertebrates (3)**

Lectures on the origin of multicellularity and phylogeny of the invertebrate higher taxa as deduced from embryology, morphology, and the fossil record. *Prerequisite: consent of instructor.* Newman (W)

**274. Marine Arthropods (5)**

Lectures and laboratories on the natural history zoogeography, taxonomy and phylogeny of arthropods with emphasis on marine forms. Alternate years. *Prerequisite: consent of instructors.* Newman, Hessler (W)

**275A. Professional Ethics in Science (2)**

A seminar on the ethics and ethos of scientific research, based on published cases of unethical behavior. (S/U grades only.) Dayton, Mullin (W)

**275C. Topics in Community Ecology (4)**

Maintenance of community structure, with special emphasis on the importance of competition, predation, energetics, and stability as they affect patterns of distribution and abundance; interrelationships between community structure and population phenomena such as trophic specialization, reproductive strategies, and life histories. *Prerequisite: consent of instructor.* (S/U grades permitted.) Dayton (S)

**275D. Natural History of Coastal Habitats (4)**

Two three-hour laboratories per week, three four-six day field trips to sites from Mexico to Monterey Bay. Several one-day field trips to local habitats including lagoons, sand and rock intertidal habitats, areas of marine fossils, and areas with migrating birds. Format of course variable depending on student interests. Alternate years with 275C. *Prerequisite: consent of instructor; open to undergraduates.* (S/U grades permitted.) Dayton (S)

**276A. Applied Non-Parametric Statistics (4)**

Methods of non-parametric statistical analysis, sampling, and experimental design with emphasis on those procedures particularly useful in marine studies. Designed to supplement Math. 285 or equivalent parametric statistics courses. Offered in alternate years. *Prerequisite: elementary statistics or consent of instructor.* Venrick (S)

**277. Deep-Sea Biology (3)**

The ecology, zoogeography, taxonomy, and evolution of deep-sea organisms, with emphasis on the benthos. Alternate years. *Prerequisite: consent of instructor.* (S/U grades only.) Hessler (W)

**278. Problems in Biological Oceanography (2)**

Presentation of reports, review of literature, and discussion of current research in biological oceanography. Seminar. (S/U grades permitted.) Staff (F,W,S)

**279. Special Topics in Biological Oceanography (1-4)**

(S/U grades permitted.) Staff (F,W,S)

**280. Biological Processes in the Sea (4)**

Marine environments and their effects on ecological processes and community structure; distribution patterns, adaptations, and evolution of marine organisms. *Prerequisite: bachelor's degree in science or consent of instructor.* Staff (F)

**281. Environmental Physiology and Biochemistry of Marine Organisms (4)**

Emphasis on adaptation to environmental factors such as temperature, pressure, and salinity. *Prerequisites: adequate*

*training in biology and physical sciences, and consent of instructor.* Somero (W)

**282. Physiology of Marine Vertebrates (4)**

Fundamental aspects of comparative physiology. Included are studies of the physical-chemical basis of living systems and the principles and adaptations of animal function. *Prerequisite: bachelor's degree in science or consent of instructor.* Hammel (W)

**284. Invertebrate Zoology (5)**

Invertebrate zoology covering all of the major and minor phyla: Phylogeny, Anatomy, Physiology and Natural History. Lecture and laboratory demonstrations. *Prerequisite: consent of instructors; no audits.* Holland, Hessler (W)

**285. Marine and Comparative Biochemistry (4)**

Biochemistry of major products of marine organisms, with emphasis on carbohydrates and lipids. The current concepts of their structural and physiological functions will be presented and discussed. *Prerequisites: organic chemistry required; physical chemistry and biochemistry recommended.* Benson (S)

**286. Behavior in Ecology (4)**

A case-history approach to the experimental analysis of ecologically relevant behavior, with emphasis on marine examples: defining the question, designing the experiments, analyzing and interpreting the data. *Prerequisites: preparation in statistics, consent of instructor.* (S/U grades permitted.) Enright (S)

**287A. Marine Microbial Ecology (4)**

Recent developments in the study of marine bacteria. Emphasis will be on biochemical and physiological adaptations of marine bacteria to the ocean environment. Bacterial metabolism, growth, and death will also be discussed in the context of trophic interactions and flows of material and energy in marine ecosystems. Molecular biology techniques used in the study of bacterial ecology will also be discussed. *Prerequisite: consent of instructor.* (S/U grades permitted.) Azam (F)

**287B. Microbial Metabolism (4)**

Biochemistry and physiology in relation to metabolic activities and elemental cycles; growth and death of bacteria. *Prerequisite: consent of instructor.* Alternate years. Staff (S)

**288. Recent Advances in Invertebrate Zoology (4)**

Lectures will cover marine invertebrates (exclusive arthropods) phylum by phylum. After a brief review of fundamentals for each group, significant studies of the last five years or so will be covered. These works will cover mainly anatomy, physiology, comparative embryology, and macroevolution. *Prerequisite: graduate standing or consent of instructor.* (S/U grades permitted.) Holland (S)

**289. Marine Plants (5)**

An introduction to marine plants and the roles they play in the ecology of the seas. *Prerequisite: consent of instructor.* Lewin (W)

**290. Ecology of Shore Microbes (4)**

Laboratory investigations of the ecology, physiology, and metabolic activities of marine littoral microorganisms (bacteria, algae, fungi, and protozoa) with some field observations. Special methods for isolating and culturing selected organisms. Individual research projects. *Prerequisites: preparation in biological sciences, including biochemistry, microbiology, and comparative physiology, and chemistry and biology of the sea recommended. Upper-division undergraduates may be admitted by consent of instructor.* (S/U grades permitted.) Lewin (S)

**291. Physiology of Marine Algae (4)**

Lectures and laboratory in comparative physiology of algae with emphasis on marine problems. *Prerequisites: basic courses in biology and chemistry.* Haxo (S)

**292. Scientific Communication (2)**

Forms of scientific communication, practical exercise in scientific writing and short oral communication and in criticism and editing; preparation of illustrations, preparation of proposals; scientific societies and the history of scientific communication. Emphasis on examples from neuroscience. *Prerequisite: consent of instructor.* (S/U grades only.) Bullock (F)

**293A-B. Animal Behavior (4-4)**

(A) Ethological approach. Species characteristics behavior, its causation and adaptive significance. Controversies on

## SOCIOLOGY

"innateness," "drives," and related concepts. Ecology in relation to neurophysiology. (B) Control mechanisms: feedback and feed forward in elementary behaviors associated with orientation and assessment of environment; random processes describing the occurrence of behavioral patterns. *Prerequisites: basic knowledge of calculus and statistics recommended.* Heiligenberg (F,W)

### 294A. Biology of Fishes (5)

The comparative evolution, morphology, physiology, and ecology of fishes. Special emphasis on local and deep-sea and pelagic forms in laboratory. *Prerequisite: graduate standing or consent of instructor.* Rosenblatt (W)

### 294B. Seminar in Advanced Ichthyology (2)

Discussion of special topics related to ichthyology. *Prerequisite: graduate standing or consent of instructor.* (S/U grades only.) Rosenblatt (F,S)

### 295. Current Topics in Developmental Biology (4)

A collection of lectures with some periods devoted to observations of fertilization and embryogenesis. Various topics of current interest in developmental biology will be discussed. *Prerequisite: consent of instructor.* (S/U grades permitted.) Vacquier (F)

### 296. Special Topics in Marine Biology (1-4)

Example topics are reproduction in marine animals, adaptation to marine environments, larval biology, marine fisheries, macromolecular evolution, physical chemical topics in physiology, philosophy of science. (S/U grades permitted.) Staff (F,W,S)

### 297. Marine Biology Seminar (1)

Lectures given by visiting scientists and resident staff and students. (S/U grades only.) Staff (F,W,S)

### 298. Special Studies in Marine Sciences (1-2)

Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. *Prerequisite: graduate standing.* (S/U grades permitted.) Staff (F,W,S)

### 299. Research (1-12)

(S/U grades permitted.) Staff (F,W,S)

## SOCIAL SCIENCE

OFFICE: 1512 Humanities/  
Undergraduate Library Building,  
Revelle College

The Departments of Political Science, Sociology, and Anthropology offer Social Science 10A-B-C as an interdisciplinary sequence focusing on questions of power, equality, authority, and culture in the modern world. The focus of the courses is substantive but also provides a general introduction to the ideas, approaches, and research methods used by contemporary social scientists. Readings are from important texts in each of the fields, and the courses are intended to build on each other.

This interdisciplinary sequence is designed to fulfill the social science requirement for Revelle College students; it is also approved for the Muir College general requirement, for the Third College social science requirement, the Department of Communication social science requirement, and may be substituted for the

lower-division political science majors from all colleges. Open to interested students.

Social Science 60 is an introduction to statistics which satisfies the statistics requirements in the Departments of Anthropology, Political Science, and Sociology. It also fulfills the operative logic requirement in Third College. This course does not require mathematical preparation beyond high school intermediate algebra. The content of the course is oriented towards social science problems, and the computer analysis of social science data.

## Courses

### Social Science 10A-B-C. Modern Society (4-4-4)

An interdisciplinary approach to the social sciences, focusing on power, equality, authority, and culture in the modern world. This course introduces theories from sociology, political science and anthropology, analyzing case studies from the United States and other societies. (F,W,S)

### Social Science 60. Elementary Statistics for the Social Sciences (4)

Introduction to the basic statistical analysis of social science data, including descriptive and inferential statistics. Included is a laboratory component involving the use of computer based programs for statistical analysis. (F,W,S)

## SOCIOLOGY

OFFICE: 7009 Humanities and Social  
Sciences Building, Muir College

### Professors:

Bennett M. Berger, Ph.D.  
Aaron Cicourel, Ph.D.  
Fred Davis, Ph.D.  
Jack D. Douglas, Ph.D.  
Peter B. Evans, Ph.D. (*Graduate School of  
International Relations and Pacific  
Studies*)  
Joseph R. Gusfield, Ph.D.  
Bennetta Jules-Rosette, Ph.D.  
Richard P. Madsen, Ph.D.  
Hugh B. Mehan, Ph.D.  
David P. Phillips, Ph.D.  
Michael S. Schudson, Ph.D.  
Andrew Scull, Ph.D., (*Chairman*)  
Jacqueline P. Wiseman, Ph.D.

### Associate Professors:

Rae Lesser Blumberg, Ph.D.  
Timothy L. McDaniel, Ph.D.  
Chandra Mukerji, Ph.D.  
Carlos Waisman, Ph.D.

### Assistant Professors:

Mounira Charrad, Ph.D.  
Mary E. Freifeld, Ph.D.  
Charles E. Nathanson, Ph.D.  
Jeff Weintraub, Ph.D. (*Acting*)  
Leon Zamosc, Ph.D.

### Adjunct Associate Professor:

Mary L. Walshok, Ph.D.

## Sociology at UCSD

Sociology studies the life of human groups: their composition, organization, culture, and development. It combines scientific and humanistic perspectives and methods to investigate a subject matter that is both broad and relevant. At UCSD, the Department of Sociology has developed an innovative curriculum which offers courses covering the full breadth of the discipline, as well as opportunities for students to specialize in areas of their choice within the major and to participate in research projects and an Honors Program.

Students can take courses in well-known areas of sociology such as: social psychology, family patterns and relations, urban and rural life, crime and deviance, religion, work and leisure, education and socialization, social classes, law and politics, social protest and movements, health and illness, race and ethnic relations, science and technology, and problems of development and modernization.

In addition, we teach courses found in few other sociology departments across the country, such as sociolinguistics, the sociology of interaction and everyday life, art and literature, myths and symbols in society, mass media, fads and fashions, international social problems, women in world development, and sex stratification. The faculty teaches courses specializing in different contemporary societies and world regions, including Africa, China, India, Latin America, and the Soviet Union.

The faculty has a wide range of research interests. The department has special strengths in the comparative-historical approach to society, cognitive sociology, ethnomethodology, and the sociology of culture. All undergraduate majors have the rare opportunity to engage in field research under the guidance of faculty members — a chance to explore on their own what they have learned in the classroom. Training is available in survey research and demographic methods, as well as in newer approaches such as visual sociology. The department encourages its majors to do independent research in order to examine thoroughly a topic of their own choosing, and to take courses in other humanities and social science departments in order to broaden their perspective on sociological topics.

Thus sociology is a valuable major for students who want to enter law, medicine, architecture, business, or politics. It also

provides a solid liberal arts education for students who plan careers in such fields as education, criminal justice, public health, urban planning, social welfare, counseling, public administration, international relations, or market research. For students who wish to pursue graduate study in the social sciences for careers in teaching or scholarly research, an undergraduate degree from the Department of Sociology will provide a thorough grounding in recent theoretical and methodological advances in the discipline. Whatever the career choice, the study of sociology can help the student cultivate a critical awareness of social life.

Students interested in majoring or minoring in sociology should stop by the Department of Sociology office, H&SS 7009, for a brochure on the program and a student handbook. These clarify specific procedures and guidelines, and provide recommendations for areas of specialization within the major, as well as for graduate studies and careers in sociology.

Transfer students should see the staff undergraduate adviser or the faculty undergraduate adviser at UCSD in order to petition to have their sociology courses from other colleges accepted to apply toward their majors here. To petition these courses a student must have received a C grade or better.

## The Undergraduate Program

### The Minor

The minor consists of six sociology courses: two lower-division and four upper-division. Unless colleges specify specific courses to be taken, the student may choose any two lower-division sociology courses (Soc. 1A, 1B, 10, 20, or 40) and any four upper-division courses (Soc. 100 to 190). Special study courses or internships may not be applied toward the minor.

### The Major

To receive a B.A. with a major in sociology, students must complete three lower-division and twelve upper-division courses in sociology, including the required courses listed below, and a course in elementary statistics (Social Science 60).

#### Lower Division

Sociology 1A, 1B, another lower-division course in sociology (Soc. 10, 20, or 40) and Social Sciences 60 (Elemen-

tary Social Statistics) are required for the major. (Social Science 60 is a new requirement effective fall quarter 1986. Those who declared their major before this time are encouraged, but not required, to take this course.) Any lower-division course serves as a prerequisite for most upper-division courses, unless otherwise specified. It is advisable that students complete these required lower-division courses (which should be taken during the freshman or sophomore year) before continuing with their upper-division work.

#### Upper Division

Twelve upper-division courses are necessary for the major — seven are courses in required areas, and the other five are upper-division electives. The upper-division sociology curriculum is divided into five areas of concentration as follows:

- I. **Theory and Method in Sociology** (Soc. 100 to 109)
- II. **Social Psychology, Sociolinguistics, and Social Interaction** (Soc. 110 to 120)
- III. **Sociology of Organizations and Institutions** (Soc. 121 to 159)
- IV. **Sociology of Culture** (Soc. 160 to 178)
- V. **Social Change, Development, and Comparative-Historical Sociology** (Soc. 179 to 189)

All students must complete Sociology 100. (Students are *strongly* advised to take Sociology 100 in their junior year.) In addition, two other courses are required from the **Theory and Method** area of concentration (Soc. 101 to 109), at least one of which must be in methods. *One* course is required in each of the other four areas. It is suggested that students take advantage of the opportunity to specialize in the discipline by taking the bulk of their remaining courses in any one area of concentration. Students are encouraged to complete their theory and methods courses early in their program, since theoretical perspectives and skills in methods will enhance their subsequent course work.

In fulfilling the major, students may apply, with the Department of Sociology approval, up to two upper-division courses from the regular offerings in the Departments of Anthropology, Economics, History, Linguistics, Political Science, Psychology, Urban Studies and Planning, macro and micro areas of the Department of Communication, and the Teacher Education Program. Courses from depart-

ments other than these may be taken if the student submits a petition to, and obtains approval from, the Department of Sociology.

### Recommendations for Transfer Students

If students wish to use courses taken at other institutions towards their major, they must first meet with the staff undergraduate adviser in the department during designated office hours. (College transcripts, college catalogs, and course syllabi should be brought at the time of appointment.) Students are required to fill out one student petition *per* transfer course as well as an additional "information sheet" available in the Department of Sociology. Once these petitions are turned in, a determination will be made regarding the transferring of courses into the program.

It is important to note that eight of the twelve upper-division courses in the undergraduate program must be taken in the Department of Sociology at UCSD, unless students obtain special acceptance of additional courses from the chairperson and the faculty undergraduate adviser.

A 2.0 GPA is required in the major (D's and F's are not applicable, effective fall 1986). *No courses taken to apply toward the major may be taken on a Pass/Not Pass basis except Sociology 198 or 199.* Only *one* such special studies course (including internships) may be applied toward the major. These special studies courses must be applied for and approved by the department before the beginning of the quarter in which the student wishes to enroll, and can only be taken on a Pass/Not Pass basis. See the staff undergraduate adviser for the necessary application forms and deadlines.

### The Honors Program

The Department of Sociology offers an Honors Program to those students who have demonstrated excellence in the sociology major. Successful completion of the Honors Program enables the student to graduate "With Highest Distinction," "With High Distinction," or "With Distinction," depending upon performance in the program.

#### Eligibility

1. Junior standing (ninety units completed).
2. GPA of 3.5 or better in the major.
3. Recommendation of a faculty sponsor familiar with student's work.

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4. Must have completed at least four upper-division sociology courses.
5. Overall GPA of 3.2 or better.
6. Interested students may pick up an application from the staff undergraduate adviser in the Department of Sociology. Completed applications must be in the department office no later than May 1.

### Course Requirement

The student must take Sociology 196A, Advanced Studies in Sociology, and Sociology 196B, Supervised Thesis Research, *in addition to* the fifteen courses required for the major. Each student will choose a faculty adviser to help supervise the thesis research and writing with the Honors Program director.

Students whose GPA in the major falls below 3.5 or who do not earn at least an A- in the Honors Seminars will not graduate with distinction, but they may count the two honors courses among the twelve upper-division courses required for the major. Students must maintain a 3.5 GPA in the major and a 3.2 overall GPA until final graduation, in order to receive Honors in the Sociology Honors Program. To graduate "With Highest Distinction" the student must earn A+; to graduate "With High Distinction" the student must earn A; and to graduate "With Distinction" the grade must be A-.

### The Graduate Program

The Department of Sociology offers a course of study leading to the doctor of philosophy degree. The department is predominantly qualitative and concentrates on three main areas:

1. **Microsociology** (which includes ethnomethodology and symbolic interactionist approaches). The department offers courses on symbolic interaction, sociolinguistics, cognitive sociology, ethnomethodology, and the sociology of everyday life. Graduate students can study field methods, sociolinguistic analysis, interview techniques, and the use of video and audio tape equipment. Substantive areas of interest include: medical sociology, marriage and the family, alcoholism, deviance, classroom interaction, and religion.

2. **Sociology of Culture** (both mass culture and high culture). Our faculty study cultural systems in Europe, the Middle East, the United States, Central and South America, and Africa. The department offers courses in popular culture,

mass media, ethnographic films, and the sociology of the arts, literature, film, and intellectual life.

3. **Comparative and Historical Society** Faculty members have done research on India, Japan, China, Spain, Britain, pre-revolutionary Russia, the Middle East, and several Latin American countries. Substantive topics have included socioeconomic and sexual stratification, class structure, theories of development, the relationships of ideology to social change, the origins of the modern penal system, comparative social movements, and the methodology of comparative historical research.

The goal of the program is to prepare students who will advance the discipline of sociology through creative research and scholarship. Students interested in an interdisciplinary Ph.D., with a concentration in sociology, can refer to the Program in Comparative Studies in Language, Society, and Culture.

### Admission

New students are admitted in the fall quarter of each academic year. Prospective applicants should submit the official application for admission and awards (same form), two sets of official transcripts from each institution attended after high school, official scores from the Graduate Record Examination, application fee, at least three letters of recommendation, and one or more samples of the applicant's own writing, such as term papers. Additionally, foreign applicants must submit official scores from the Test of English as a Foreign Language (TOEFL) and a confidential financial statement. Applicants are encouraged to visit the department to talk with faculty and graduate students. The application deadline is 15 January.

### Program of Study

Programs of study are determined in consultation with the graduate adviser, who supervises the work of students until their doctoral committees have been established. During the first year of study students have little time for individual variation because the first three quarters are spent fulfilling the basic requirements of the core curriculum. Thereafter, students have more freedom of choice.

Graduate students who have received either a master's degree or its equivalent from other universities may petition to omit core curriculum courses that appear to repeat work they already have completed successfully. Students who are granted

course exemptions will not have to take those portions of the year-end core curriculum examination dealing with the waived areas. Generally petitions requesting course exemptions are submitted after the student has arrived on campus.

### The Core Curriculum Sequence

The "core curriculum" is a group of eight courses distributed over five quarters. Three of these courses cover the history of sociological theory, and five of them deal with methods of research. The core curriculum is designed to introduce graduate students to some of the major issues in sociological theory, to some of the important research undertaken to test or exemplify theories, and to some of the methods and techniques used in such research. The core curriculum is also designed to provide students the opportunity to conduct their own research, using methods of data collection and analysis such as participant-observation, field-study observation, historical and documentary methods, survey-data collection and analysis through interviewing and questionnaires, and the use of appropriate statistical techniques.

Each quarter of the first year, students are required to enroll in one core course in theory and one in methods. In addition, the first-year cohort takes "Orientation to Faculty" during fall quarter, and "Independent Study" during winter and spring quarters. The faculty orientation course introduces a different senior faculty member each week in order for that person to present his or her own research. During winter quarter students take an independent study as a literature review course with a faculty member of their choice. The independent study is continued in spring quarter with the same professor to produce a paper. The fourth and fifth core courses in methods are taken in the fall and winter quarters of the second year. The core courses are those numbered 200 through 208.

### The Core Curriculum Examination

At the end of the spring quarter first-year students will take written examinations on the content of the theory and methods sequence of the core curriculum courses taken in the first year. The purpose of this examination is to assess the students' comprehension of the materials offered in the core curriculum and their mastery of fundamental sociological concepts. The tests are prepared and evaluated by the faculty members who teach in the core curriculum. On the basis of their course work and their performance in the



examination, students will receive a written evaluation of their progress at the end of the first year. No examination is required after the seventh and eighth core courses are completed in the second year.

### Preparation for the Oral Qualifying Examination

Students spend the second year broadening their knowledge of different fields of interest and exploring ideas for their dissertations. Prior to the oral qualifying exams students are required to take six substantive seminars, at least four of which must be taken for a letter grade. With the approval of the graduate adviser, one of these may be in a related discipline. It is also recommended that students take courses outside the department in order to broaden their knowledge of fields related to sociology.

By the end of the second year, students should be fairly certain of the three subfields of sociology in which they would like to specialize and have a good idea of which faculty members they want on their doctoral committees. Three of the six required seminars must be in the general areas of specialization. Students deepen their knowledge of their special areas through a combination of tutorials and independent studies. In addition to gaining competence in three subfields of sociology, students will be expected to prepare a dissertation proposal prior to taking the oral qualifying examination. Students must write a paper in each of their three areas, to be submitted at least a month prior to the proposed examination date. After the committee has approved the three papers and the dissertation proposal the student is deemed ready to take the orals.

### Oral Qualifying Examination

The oral qualifying examination will be conducted by the student's doctoral committee. The aims of the examination are to test the student's knowledge of three areas of specialization, and his or her readiness to undertake further work on the tentative dissertation proposal. The department expects students to pass the oral qualifying examinations no later than the end of the fourth year of graduate study. The performance of those students who fail to do so will be reviewed by the committee on graduate students, which will set a deadline by which the examination must be completed if the student is to remain in the program. After passing the

qualifying examination, the student is eligible to receive a candidate in philosophy degree and a master of arts degree.

### Dissertation Research and Preparation

The nature and requirements of dissertation research vary greatly depending upon the specific problem chosen. Once the student's doctoral committee has approved the dissertation proposal the student is ready to begin research and writing. At least one of the orals papers should become part of the dissertation, possibly even an entire chapter. Throughout the research and writing phase of the student's graduate career he or she should consult frequently with the committee. When the dissertation is substantially completed copies are distributed to the committee four to six weeks prior to the proposed defense date. After reading the draft the committee meets without the student to discuss it, then notice is given to the student of any changes required. The actual dissertation defense takes place at least one month after the preliminary meeting, after any changes are made. The final dissertation must be approved by each member of the doctoral committee and filed with the University Librarian. Acceptance of the dissertation by the librarian represents the final step in completing all the requirements for a doctor of philosophy degree.

## Courses

### Lower Division

#### 1A. The Study of Society (4)

An introduction to the major ideas, concepts, and methods in the study of societies; social interaction, social structure and culture; the construction and acquisition of social roles and organizations; major institutions and processes of change. The first quarter will focus on *classical* approaches to the study of societies.

#### 1B. The Study of Society (4)

An introduction to the major ideas, concepts, and methods in the study of societies, with an emphasis on *modern* approaches in sociological theory and analysis. (*This course may be taken prior to Soc. 1A.*)

#### 10. American Society: Social Structure and Culture in the United States (4)

An introduction to American society in historical and world perspectives, touching on the following topics: the American culture tradition; industrialization, capitalism and the welfare state; careers, work and leisure; the changing forms of family and kinship stratification; the distribution of wealth, power and prestige; politics; community — national and international; ethnic and racial groups; the changing position of religion, education, the mass media and the arts; predicting future trends.

#### 20. Social Change in the Modern World (4)

A survey of the major economic, political, and social forces that have shaped the contemporary world. The course will provide an introduction to theories of social change, as well as prepare the student for upper-division work in com-

parative-historical sociology. Topics may include: origins and growth of the world economic system, the formation of the nation-state and political modernization, industrialization and urbanization and their social consequences, the population explosion and the demographic transition, modern revolutions and nationalism, and prospects of social change in rich and poor nations.

#### 40. Sociology of Health Care Issues (4)

Designed as a broad introduction to medicine as a social institution and its relationship to other institutions, as well as its relation to society. It will make use of both micro and macro sociological work in this area and introduce students to sociological perspectives of contemporary health care issues.

## Upper Division

### I. THEORY AND METHOD IN SOCIOLOGY

#### A. Theory

##### 100. Classical Sociological Theory (4)

(Numbered 150 prior to 1981-82.) (Listed as *History of Sociology prior to 1987-88.*) Major figures and schools in sociology from the early nineteenth century onwards, including Marx, Tocqueville, Durkheim, and Weber. The objective of the course is to provide students with a background in classical social theory, and to show its relevance to contemporary sociology.

##### 101. Advanced General Sociology (4)

A critical examination of basic concepts of sociology; social organization, culture, structure, stratification, etc., in their relation to selected problems of analysis and research.

##### 102. Contemporary Sociological Theory (4)

(Numbered 151 prior to 1981-82.) An analysis of leading theories in sociology with an emphasis on contemporary perspectives. Theoretical approaches include functionalism, Marxism, systems analysis, and interpretive sociology. *Prerequisites: senior standing or three sociology courses.*

##### 103T. Special Topics in Theory (4)

Reading and discussion of particular theoretical issues in sociology. Topics will vary from year to year, depending on the current research of regular faculty or visiting faculty. Issues may include: the study of a specific problem in social theory; the analysis of a particular theorist or school.

##### 181. Modern Western Society (4)

(*Cross-listed with area V. For course description see area V.*)

#### B. Methods

##### 103M. Computer Applications to Data Management in Sociology (4)

The course aim is development of student skills in computer management and analysis of sociological data. This is pursued through practical experience with data produced by sociologically directed research. Students will be expected to develop competency in the analysis of such data sets, primarily by developing an extensive acquaintance with the MINITAB or SPSS-X statistical and data management language.

##### 104. Field Research: Methods of Participant-Observation (4)

(Numbered 101 prior to 1981-82.) A basic course on the relations between sociological theory and field research. There is a strong emphasis on the theory and methods of participant observation, including a consideration of the problems of entry into field settings, recording observations, description and analysis of field data, and ethical problems in field work. Students will write a paper using these field methods.

##### 105. Ethnographic Film (4)

(Numbered 163 prior to 1981-82.) This course will analyze the methods and underlying assumptions of field observation and ethnographic reporting. It will contrast written and audio-visual and ethnographies, including films and videotapes, and critically examine their styles, approaches, and uses as a form of sociological analysis. Opportunities will be provided for the application of these methods.



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### 106. Comparative and Historical Methods (4)

A broad-based consideration of the use of historical materials in sociological analysis, especially as this facilitates empirically oriented studies across different societies and through time, and their application in student research projects.

### 107. Demographic Methods (4)

This course covers the methods and materials of demography, including: (1) methods of measuring fertility, mortality, and migration; (2) techniques for enumerating and estimating population size; (3) techniques for predicting the size of future population. The course will include a brief introduction to epidemiology, and explore the role of demographic explanations of social events, particularly birth, death, migration, marriage, illness, and health.

### 108A. Survey Research Design (4)

This course covers the translation of research goals into a research design, including probability sampling, questionnaire construction, data collection including interviewing techniques, data processing, coding, and preliminary tabulation of data. Statistical methods of analysis will be limited primarily to percentaging.

### 108B. Survey Research Analysis (4)

This course examines the quantitative analysis of survey research data through computer-based student participation in the research process. Emphasis will be placed on index and scale construction, univariate, bivariate, and multivariate types of analysis, including some standard descriptive and inferential statistics. (Sociology 108A and/or an introductory statistics course is recommended.)

### 109. Statistical Analysis of Sociological Data (4)

(Numbered 181 prior to 1981-82.) A problem-centered course, emphasizing the correct application of elementary statistical techniques to actual sociological data. The course will cover statistics commonly used in sociological analysis (binomial, t-test, Chi-squared, regression, correlation). Students will be taught to use the program language BASIC and the statistical package MINITAB. Prerequisites: Math. 1A-B or an introductory statistics course or consent of instructor.

## II. SOCIAL PSYCHOLOGY, SOCIOLINGUISTICS, AND SOCIAL INTERACTION

### 110. Human Nature in Civilization (4)

This course will deal with all the fundamental issues and knowledge about human nature. It will draw upon all of the disciplines studying human nature: genetics, the neurosciences, the behavioral biologies (ethology, sociobiology, etc.), psychology and psychiatry, history and the social sciences. It will be an attempt to communicate to students what is known (and not known) scientifically about human nature.

### 111. Individual and Society (4)

(Numbered 109 prior to 1981-82.) This course will cover the classic confrontation between the individual and the society, and its recent compression into social psychology. We will explore the historical change in this relation through the writings of nineteenth-century social philosophers, twentieth-century psychologists and sociologists, and several literary figures.

### 112. Social Psychology (4)

(Numbered 102 prior to 1981-82.) This course will deal with human behavior and personality development as affected by social group life. Major theories will be compared. The interaction dynamics of such substantive areas as socialization, normative and deviant behavior, learning and achievement, the social construction of the self and the social identities will be considered.

### 113. Sociology of Interaction and Everyday Life (4)

(Numbered 100 prior to 1981-82.) This course will attempt to construct a science out of everyday life by examining its recurrent features. We will focus particularly on the vicissitudes of the individual's self, the subtleties of interpersonal interaction, and the group experiences of multiple realities.

### 114. Life Studies (4)

This course will show students through reading and practice how to do studies of individual lives. The goal will be to understand individuals' whole selves, scientifically and appreciatively. It will involve both self-studies and studies of others,

but the course paper will be a self-study. All significant problems involved in doing these studies objectively will be examined.

### 115. Introduction to Sociolinguistics (4)

(Numbered 106 prior to 1981-82.) Investigation of the fundamental relations between the forms of language and other aspects of human social order. Special emphasis is given to the interaction between selected modes of language investigations and theories of social cognition and behavior. Prerequisite: one lower-division social science sequence, or upper-division standing, or consent of instructor.

### 116. Discourse and the Nuclear Arms Debate (4)

(Same as Comm/SF 166.) This course will focus on the forms of speaking and thinking involved in the debate over nuclear arms. The content consists of three basic parts: (1) we will review certain basic facts about nuclear arms and their history, (2) we will outline an approach to modes of discourse (speaking and thinking) that can serve as a foundation for examining some of the specific arguments that have occurred in the nuclear arms debate, (3) we will examine some of these specific arguments. In the third goal of the course we will analyze various texts (books, government documents, films, etc.)

### 117. Language Culture and Education (4)

The mutual influence of language, culture, and education will be explored; explanations of students' school successes and failures that employ linguistic, and cultural variables will be considered; bilingualism; cultural transmission through education.

### 118. Sociology of Sex and Gender Roles (4)

(Numbered 173 prior to 1981-82.) An analysis of the social, biological, and psychological components of becoming a man or a woman. The course will survey a wide range of information in an attempt to specify what is distinctively social about gender roles and identities; i.e., to understand how a most basic part of the "self" — womanhood or manhood — is socially defined and socially learned behavior. (Cross-listed with area III-C.)

### 119. Love (4)

(Numbered 176 prior to 1981-82.) This course will examine the complete range of intimate relations, from friendship to daemonic love. It will draw on all the major disciplines studying human psychology and behavior to understand these relations.

### 120. Mind, Self, and Society (4)

Freud's theory and its implications for the study of society. The first part of the course will focus on Freud's own theoretical project, examining first his theory of mind; then his more comprehensive theory of personality and personality development; then his ventures into the analysis of culture, politics, and society. The second part will move on to consider the broader significance of his theory for understanding human nature and the social order; it may take into account subsequent developments in psychoanalysis, attempts by other thinkers to use and develop Freud's ideas, alternative approaches, etc.

### 120S. Special Topics in Social Psychology and Social Interaction (4)

This course will examine key issues in social psychology and the micro-sociological study of social interaction. Topics will include sociolinguistics, socialization, social cognition, and the study of personality and social interaction. Content will vary from year to year.

## III. SOCIOLOGY OF ORGANIZATIONS AND INSTITUTIONS

### A. Economy: Studies of the Division of Labor and the Social Organization of Economic Life

#### 121. Economy and Society (4)

(Numbered 119 prior to 1981-82.) An examination of a central concern of classical social theory: the relationship between economy and society, with special attention (theoretically and empirically) on the problem of the origins of modern capitalism. The course will investigate the role of technology

and economic institutions in society; the influence of culture and politics on economic exchange, production, and consumption; the process of rationalization and the social division of labor; contemporary economic problems and the welfare state.

#### 122. Organizational Behavior (4)

(Numbered 111 prior to 1981-82.) The course involves an in-depth study of various types of organizational structures, analyzed in their historical and social structural context. Both formal and informal organizational structures are examined, with special emphasis on their macro-structural determinants as well as the behavior of people within those structures. The course will also critically consider theories and ideologies of management in bureaucratic organizations, including the "Scientific Management" of Frederick W. Taylor, the "Human Relations" school, and modern approaches.

#### 123. Sociology of Work (4)

A comparative analysis of work in contemporary industrial economies. Topics include: the division of labor in manufacturing and the changing structure of the working class, social and political consequences of skill and wage differentials, the impact of automation, bureaucratization and determinants of job satisfaction, trade unions and their strategies, industrial conflict, types of labor movements, and the relationships between unions and political parties.

#### 124. Occupations and Professions (4)

(Numbered 113 prior to 1981-82.) Analysis of the social organization of work in modern societies, the concept of career, the development of professionalization. Occupational subcultures; work, leisure and alienation; social relationships; professional and occupational associations. Prospects for the humanization of work; democratization, derationalization, deprofessionalization. Change and conflict in contemporary occupations and professions.

## B. Education: Studies of Schooling and Society

#### 117. Language, Culture and Education (4)

(Cross-listed with area II. For course description see area II.)

#### 126. Social Organization of Education (4)

(Numbered 116 prior to 1981-82.) The social organization of education in the U.S. and other societies; the functions of education for individuals and society; the structure of schools; educational decision making; educational testing; socialization and education; formal and informal education; cultural transmission.

#### 127. Comparative Educational Sociology (4)

(Numbered 118 prior to 1981-82.) The organization of education in a number of historical and contemporary societies, such as ancient Greece and Rome, medieval Europe, traditional China, India, and Japan, and contemporary United States, Russia, England, France, and Germany. Education will be examined in terms of its internal organization and in relation to religious and secular ritual and ideology, to stratification, economics, and politics.

## C. Family and Population: Studies of Kinship, Reproduction, and the Life Cycle

#### 118. Sociology of Sex and Gender Roles (4)

(Cross-listed with area II. For course description see area II.)

#### 129. The Family (4)

(Numbered 110 prior to 1981-82.) An examination of the family as an institution in modern and premodern societies. This course will begin with a study of the principles of kinship and then investigate the relationship of the family to social structure and social change.

#### 131. Sociology of Youth (4)

(Numbered 162 prior to 1981-82.) Chronological age and social status; analysis of social processes bearing upon the socialization of children and adolescents. The emergence of "youth cultures," generational succession as a cultural problem. (Cross-listed with area IV.)

#### 133. Comparative Sex Stratification (4)

(Numbered 171 prior to 1981-82.) Utilizing a new theory of factors affecting female status, we examine topics including women in evolutionary perspective; Third World women and

modernization; women's changing position in the USSR, Israeli kibbutz, and especially the U.S.A.; and the political economy of sex stratification. (Cross-listed with area V.)

## D. Health and Illness: Studies of the Social Organization of Medicine

### 135. Sociology of Health and Illness (4)

(Numbered 178 prior to 1981-82.) A selective inquiry into the roles of culture, social structure, and organized health professions for defining, mediating, and structuring the health and illness experiences of key social groups in American society.

### 136A. Sociology of Mental Illness: An Historical Approach (4)

(Numbered 136 prior to 1985.) An examination of the social, cultural, and political factors involved in the identification and treatment of mental illness. This course will emphasize historical materials, focusing on the eighteenth, nineteenth and early twentieth centuries. Developments in England as well as the United States will be examined from an historical perspective.

### 136B. Sociology of Mental Illness: In Contemporary Society (4)

(Numbered 136 prior to 1985.) This course will focus on recent developments in the mental health sector and on the contemporary sociological literature on mental illness. Developments in England as well as the United States will be examined.

### 137. Alcohol and Society (4)

The purpose of this course is to give the student an overview of the multitude of problems and the complex issues connected with the manufacture, sale, and consumption of alcohol. The course will be divided into three parts: (1) The positive and negative physiological, psychological and social effects of alcohol consumption; theories of alcohol causation; (2) Microsociology of alcoholism — interaction of alcoholics with relatives, friends, treatment professionals; (3) Macrosociology of alcohol (manufacture, sale, consumption) — effects on society of alcoholism, the development of alcohol policies and their assessment. (Cross-listed with area II.)

## E. Law and Social Control: Studies of Rule Making, Rule Breaking, and Rule Enforcing

### 140. Sociology of Law (4)

(Numbered 122 prior to 1981-82.) This course analyzes the functions of law in society, the social sources of legal change, social conditions affecting the administration of justice and the role of social science in jurisprudence.

### 141. Crime and Society (4)

(Numbered 133 prior to 1981-82.) A study of the social origins of criminal law, the administration of justice, causes and patterns of criminal behavior, and the prevention and control of crime, including individual rehabilitation and institutional change, and the politics of legal, police and correctional reform.

### 142. Social Deviance (4)

(Numbered 121 prior to 1981-82.) This course studies the major forms of behavior seen as rule violations by large segments of our society and analyzes the major theories trying to explain them, as well as processes of rule making, rule enforcing, techniques of neutralization, stigmatization and status degradation, and rule change.

### 143. Suicide (4)

(Numbered 123 prior to 1981-82.) Traditional and modern theories of suicide will be reviewed and tested. The study of suicide will be treated as one method for investigating the influence of society on the individual.

### 144. Forms of Social Control (4)

(Numbered 142 prior to 1981-82.) The organization, development, and mission of social control agencies in the nineteenth and twentieth centuries, with emphasis on crime and madness; agency occupations (police, psychiatrists, correctional work, etc.); theories of control movements.

## F. Politics: Studies of Power and Legitimacy

### 145. Nuclear Weapons and American Society 1945-1983 (4)

(Same as STPA 145.) The course analyzes the growth of a nuclear weapons culture in the United States and its impact upon key social institutions, including the military, science, the economy, Congress, and the electorate. Developments in national security policy, nuclear strategy, weapons production, and arms control will be discussed from this institution perspective.

### 146. Social Stratification (4)

(Numbered 112 prior to 1981-82.) The causes and effects of social rankings in various societies. Theories of stratification; the dynamics of informal social groupings; determinants of institutional power and the nature of struggles for power; the distribution of wealth and its causes; the dynamics of social mobility; the effects of stratification on life styles, culture, and deviance.

### 147. Power in American Society (4)

(Numbered 143 prior to 1981-82.) This course examines the ways in which power has been conceived and contested by elites and non-elites during the course of American history. Through the writings, speeches and biographies of contestants in these struggles, the course explores the changes which have occurred in political rhetoric and strategies as America has moved from a relatively isolated agrarian and commercial republic to a military and industrial empire. Topics will include: the struggle over the Constitution, antebellum reform, agrarian and labor radicalism after the Civil War, the rise of socialist and communist parties after World War I, and the multifaceted protest movements of the 60s and 70s. The course ends by considering the present in light of its continuities and discontinuities with the above traditions.

### 148. Political Sociology (4)

(Numbered 124 prior to 1981-82.) The contributions of sociology to the study of political systems and processes, including the analysis of the sociocultural context of political behavior and the bases of power and legitimacy.

### 149. Theory of Social Problems (4)

Structure and process by which situations become public issues; analysis of movements to criminalize or decriminalize, such as abortion, homosexuality, alcohol consumption, gambling, pornography, prostitution. Development of conflict and consensus of public issues; shifts between public and private problems. Prerequisites: Soc. 1A and 1B.

### 150. Equality and Inequality (4)

(Numbered 146 prior to 1981-82.) Equality and elitism as persistent issues in modern societies. Materials from philosophy, history, and social sciences are used to define and describe current arguments and existing patterns of political power, popular and high culture, educational equality, and the distribution of income.

### 151. Comparative Race and Ethnic Relations (4)

(Numbered 135 prior to 1981-82.) An historical and comparative analysis of race and ethnic relations in various national settings, with emphasis on the United States. The course will analyze the origins of ethnic stratification systems (including slavery, conquest, annexation, and immigration), the maintenance of such systems of ethnic and racial dominance (discrimination, race ideologies and prejudice, structural disadvantage, suppression of revolts); the adaptation of minority communities, and the role of reform and revolutionary movements and government policies in promoting civil rights and social change. (Cross-listed with area V.)

### 152. Urban Social Problems (4)

(Same as USP 120.) (Numbered 120 prior to 1981-82.) Concerns the facts and theories of contemporary urban social problems in the United States. The emphasis will be on social problems, not on urbanism. Topics may include: urban poverty; inequality based on sex, age and race; crime and deviance; urban environment, pollution, housing, transportation, and health; fiscal crisis and the politics of municipal finance, including the role of ideology and interest groups in the definition of social problems.

### 153. The Urban Underclass (4)

(Same as USP 159.) This course focuses on the marginal peoples making up the surplus labor population in both underdeveloped countries and the United States. Theories of

poverty and underemployment stressing structural factors are emphasized. The family structure, life, and employment histories of the urban poor are related to the larger political economy. (Cross-listed with area V.)

### 154. International Social Problems (4)

A broad inquiry into the scope and sources of international social problems, including: world hunger and starvation, population growth, migration, health care, resource depletion and global ecopolitics; maldistribution of resources, modes of world food/energy production and consumption, patterns of world poverty and the international stratification system; international conflict, terrorism, and nuclear weapons. The course will include a consideration of alternative theories of global prospects and the dilemmas of policies which seek to deal with social problems that are not nation-specific. (Cross-listed with area V.)

### 155. American Military Strategy and Foreign Relations (4)

This course will provide a basic analysis of the nature and cause of conflict and violence as well as an overview of the history of the pursuit of power by leaders of states. Also covered will be the changing nature of warfare in industrial society and a detailed discussion of the consideration of modern warfare, including present nuclear and non-nuclear conflict and strategies.

## G. Religion: Studies of the Social Construction of the Sacred

### 156. Sociology of Religion (4)

(Numbered 149B prior to 1981-82.) Diverse sociological explanations of religious ideas and religious behavior. The social consequences of different kinds of religious beliefs and religious organizations. The influence of religion upon concepts of history, the natural world, human nature, and the social order. The significance of such notions as "sacred peoples" and "sacred places." The religious-like character of certain political movements and certain sociocultural attitudes.

### 157. Religion in Contemporary Society (4)

(Numbered 149A prior to 1981-82.) This course will explore ways of approaching sacred texts, religious experiences, and ritual settings from the perspective of their construction in the world. We will examine how aspects of these phenomena can be made more fully available to sociological analysis. The course will treat also religious institutions and some background material in the analytic study of religion. Data from African religions will be used as a resource for lecture and study.

### 158. Myth and Symbols in Society (4)

(Numbered 152 prior to 1981-82.) A study of the contribution of mythical symbols and narratives to the establishment of social meanings and behavior in primitive and modern societies. Included will be a review of different theories of myth and narrative, such as those of Levi-Strauss, Cassirer, and Propp. Prerequisite: one lower-division social science sequence, or upper-division standing, or consent of instructor.

## H. Special Topics

### 159. Special Topics in the Sociology of Organizations and Institutions (4)

Readings and discussion of particular substantive issues and research in the sociology of organizations and institutions — including such areas as population, economy, education, family, medicine, law, politics, and religion. Topics will vary from year to year.

## IV. SOCIOLOGY OF CULTURE: SOCIAL BASES OF ART, KNOWLEDGE, AND WAYS OF LIFE

### 131. Sociology of Youth (4)

(Cross-listed with area III-C. For course description see area III-C.)

### 160. Sociology of Culture (4)

(Numbered 108 prior to 1981-82.) This course will examine the concept of culture, its "dis-integration" in the twentieth century, and the repercussions on the integration of the individual. We will look at this process from a variety of perspectives, each focusing on one cultural fragment (e.g., knowledge, literature, religion) and all suggesting various means to reunify culture and consequently the individual.

## SOCIOLOGY

### 161. Sociology of Leisure (4)

An historical and comparative analysis of conceptions of leisure, and their applicability at varying levels of social stratification. The course will also examine leisure patterns and social change.

### 162. Popular Culture (4)

(Same as Comm/SF 174.) (Numbered 105 prior to 1981-82.) An overview of the historical development of popular culture with particular emphasis on the growth of the mass media. Lectures and readings cover a variety of the forms of popular culture that have emerged from the early modern period to the present, review major theories explaining how popular culture reflects and/or affects other patterns of social behavior, and discuss the role of popular culture in general, and the mass media in particular, in contemporary society. *Prerequisite: one lower-division sociology course, or Comm/SF 100, or consent of instructor.*

### 163. Social Outcasts (4)

The idea of the social outcast. Religious outcasts, racial outcasts, moral outcasts, occupational outcasts, intellectual/artistic outcasts. The "chosen people-outcast group" paradox. The "outcast-savior" paradox. Outcast groups as "secret expressions" of the social self and as "projections" of the social imagination. Outcast groups as "utopias." "Untouchables," bohemians, "holy madmen," bandits, and other romantic delinquents, the Mafia, gypsies, and others. The social function of outcasts.

### 164. Advertising and Society (4)

(Same as Comm/Cul 170.) (Numbered 104 prior to 1981-82.) Advertising in historical and cross-cultural perspectives. Topics will include: the ideology and organization of the advertising industry, the meaning of material goods and gifts in capitalist, socialist and nonindustrial societies, the natures of needs and desires and whether advertising creates needs and desires, and approaches to decoding the messages of advertising. *Prerequisite: Comm/Cul 100, or one lower-division sociology course; upper-division students only, or consent of instructor.*

### 165. The American News Media (4)

(Same as Comm/Cul 173 and Poli. Sci. 1021.) (Numbered 148 prior to 1981-82.) History, politics, social organization, and ideology of the American news media. Special attention will be paid to historical origins of journalism as a profession, and "objective reporting" as ideology; empirical studies of print and TV journalism as social institutions; news coverage of Vietnam and its implications for theories of the news media. *Prerequisite: upper-division standing or consent of instructor.*

### 166. Sociology of Knowledge (4)

(Numbered 153 prior to 1981-82.) This course will critically examine the social foundations of knowledge and its uses in society. Emphasis will be placed on: the study of social cognition and perception, comparative knowledge and belief systems, the rise of ideologies, and the social institutions affecting the development and transmission of knowledge, including universities and the mass media. Theories of the social construction of reality will also be considered.

### 167. Intellectuals and Society (4)

(Numbered 160 prior to 1981-82.) Sociological analysis of the intelligentsia: types of intellectual theories concerning their social role; research on the social sources of intellectual work in politics, literature, art, and science; historical considerations of intellectual milieu; international comparisons of intellectuals.

### 168. Culture, Science, and Society (4)

(Numbered 157 prior to 1981-82.) The impact of science as an ideology and an institution on modern American society. Discussion will include the political use of science, the organization of research, and the effect of science on American culture.

### 169. Social Biology (4)

What can sociologists and social biologists learn from one another? The course will examine recent attempts to explain human social behavior in terms of evolutionary biology. Special attention will be given to the problem of the evolution of symbolism and language and their role in the human adaptive pattern.

### 170. Collective Behavior and Fashions (4)

(Numbered 159 prior to 1981-82.) An inquiry into the sources, character, and consequences of such collective phenomena as crowds, riots, fads, and most especially fashions as well

as other abrupt shifts in mass moods and tastes, i.e., all those "eruptions" which seem to occur outside the main institutional spheres of life but which nevertheless have an important impact upon them.

### 171. Sociology of Art (4)

(Numbered 185 prior to 1981-82.) A review of sociological theories about the origins, content, and functions of art. Art as a presumed "representation" of the social order or aspects of it. Art and political systems and ideologies. Art and the "social structure." Art and "social status." The social significance of certain institutions and practices related to art, like museums and art collecting. The persistence in the modern world of artistic values developed under preindustrial and aristocratic conditions. There will be illustrations from the history of painting and sculpture in Europe and the United States.

### 172. Films and Society (4)

(Numbered 187 prior to 1981-82.) An analysis of films and how they portray various aspects of American society and culture.

### 173. Visual Knowledge (4)

(Same as Comm/Cul 160.) (Numbered 188 prior to 1981-82.) This course will cover four different uses of media images as documents of natural events: documents of families (home movies, family photographs), educational documentaries, media images for scientific research, and conventional documentary films. Classes will include discussion of and lectures about characteristics of those situations in which these types of images are produced and interpreted as well as the methods people use to evaluate and interpret these kinds of visual information. *Prerequisite: one lower-division sociology course, or Comm/Cul 100, or consent of instructor.*

### 174. Sociology of Literature (4)

(Numbered 156 prior to 1981-82.) Literature will be discussed in the context of the ideas of national and regional culture, "historical situations" and "social order." Other issues to be studied are literary men and women as spokespersons and as rebels, literary movements and social conditions, and literary works as social documents.

### 175. Sociology and Drama (4)

(Numbered 158 prior to 1981-82.) The ways in which dramatic metaphors (e.g., the dramaturgical model, the concept of social drama, and the concept of frame) have been applied to the study of human interaction. Also, the ways in which the detailed study of nonverbal behavior (kinesics and proxemics) can be applied to theory and practice in theater.

### 176. Sociology of Design (4)

(Same as Comm/SF 172.) This course will examine design as a social force. In transforming natural objects to make the human environment, people have not only cultivated and used technical skills, but also developed design traditions. We not only build houses, but certain kinds of houses; we have clothes that are styled to convey social characteristics, not just to keep us warm or protect our modesty. This course will examine how our design traditions mediated between nature and human society and how they have been used to sustain or challenge social order.

### 177. Understanding Life Phenomena through Sociological Concepts through Drama (4)

(Same as Theatre 177.) This course will compare, contrast, and where possible synthesize the way in which sociologists attempt to understand the complexities of behavior in human group life through the use of concepts and systematic investigation, with the way dramatists attempt to distill and portray these same emotionwrought situations. Major sociological concepts will be discussed and portions of well-established plays will be presented by drama majors which illustrate these concepts in action. Lectures on the playwright's goals and dramatic components of the play, as well as generic applications of the concept to other areas of human group life will be offered as a catalyst to class discussion. Students will be assigned related readings in both sociology and drama.

### 178. Special Topics in the Sociology of Culture (4)

This course will treat themes that cross-cut the customary subdivision of the sociology of culture. It will consist of readings and discussions of particular theoretical, substantive, and research problems in this field. Topics will vary from year to year.

## V. SOCIAL CHANGE, DEVELOPMENT, AND COMPARATIVE/HISTORICAL SOCIOLOGY

### 127. Comparative Educational Sociology (4)

(Cross-listed with area III-B. For course description see area III-B.)

### 133. Comparative Sex Stratification (4)

(Cross-listed with area III-C. For course description see area III-C.)

### 151. Comparative Race and Ethnic Relations (4)

(Cross-listed with area III-F. For course description see area III-F.)

### 153. The Urban Underclass (4)

(Cross-listed with area III-F. For course description see area III-F.)

### 154. International Social Problems (4)

(Cross-listed with area III-F. For course description see area III-F.)

### 179. Social Change (4)

(Numbered 169 prior to 1981-82.) A general introduction to processes of social change at different levels of analysis (micro-macro). Myths and meanings of change. Major theories of change (social-psychological, structural-functional, cyclic, developmental, conflict); dialectical and nondialectical perspectives. Sources and mechanisms of change; materialistic and idealistic perspectives, the role of technology and ideology, elites and youth, conflict and violence. Willied history: strategies of change. Major contemporary patterns and trends: the world system and social change in the twentieth century.

### 180. Social Movements and Social Protest (4)

(Numbered 140 prior to 1981-82.) An examination of the nature of protests and violence, particularly as they occur in the context of larger social movements. The course will further examine those generic facets of social movements having to do with their genesis, characteristic forms of development, relationship to established political configurations, and gradual fading away.

### 181. Modern Western Society (4)

This course examines the nature and dynamics of modern Western society in the context of the historical process by which this type of society has emerged over the last several centuries. The aim of the course is to help students think about what kind of society they live in, what makes it the way it is, and how it shapes their lives. Some basic themes include the growth and transformation of capitalism; the significance of the French and industrial revolutions; the culture of individualism; mass politics and mass society; and the different kinds of interplay between social structure and personal experience. (Cross-listed with area I.)

### 182. Revolutions (4)

An historical and comparative analysis of a selected set of modern political revolutions. Review and criticism of social class interpretations of revolutions. The role of revolutions in redefining the moral terms of social life.

### 184. Societal Evolution and Economic Development (4)

(Same as USP 170.) (Numbered 170 prior to 1981-82.) This course will examine agricultural societies at different evolutionary levels of technological and societal complexity, ranging from hunting-gathering bands with incipient agriculture to traditional agrarian empires. We shall explore the impact of change, modernization, and the world economy on contemporary rural societies, especially Third World underdeveloped areas.

### 185. The Political Economy of Development and Underdevelopment (4)

(Same as USP 168.) (Numbered 168 prior to 1981-82.) This course reviews theories and definitions of development, traces the Industrial Revolution in the West and Japan, and analyzes how the colonialism and world economy fostered by the industrial capitalist countries affected development of Third World nations. Finally, some alternate development paths pursued by underdeveloped countries are examined.

**NOTE: Sociology 188A-E are independent courses and not part of a sequence.**

**188A. Community and Social Change in Africa (4)**

(Numbered 144 prior to 1981-82.) The process of social change in African communities, with emphasis on changing ways of seeing the world and the effects of religion and political philosophies on social change. The methods and data used in various village and community studies in Africa will be critically examined.

**188B. Chinese Society (4)**

(Numbered 145 prior to 1981-82.) The social structure of the People's Republic of China since 1949, including a consideration of social organization at various levels: the economy, the policy, the community, and kinship institutions.

**188C. Social Change in Modern India (4)**

The social structure of India since 1947 and processes of change affecting it. Description and analysis of the caste system; its influence and response to electoral politics; educational and organizational developments; social and political movements.

**188D. Latin America: Society and Politics (4)**

(Numbered 164 prior to 1981-82.) A survey of the literature on Latin American social structures and political systems. The emphasis will be historical and comparative, and most readings will deal with the entire area or a group of countries rather than particular cases.

**188E. Soviet Society (4)**

(Numbered 114 prior to 1981-82.) Social structure and social change in the USSR since 1917. This course will focus on contrasts between the social institutions of the U.S. and the USSR. Topics likely to be considered are: politics, the economy, law and mobility, and the family. A primary theme of the course will be the implications of the centrality of the state in the USSR and of the individual in the U.S.

**189. Special Topics in Comparative-Historical Sociology (4)**

Readings and discussion in selected areas of comparative and historical macrosociology. Topics may include the analysis of a particular research problem, the study of a specific society or of cross-national institutions, and the review of different theoretical perspectives. Contents will vary from year to year.

**VI. SENIOR SEMINARS, HONORS COURSES, AND SPECIAL STUDIES**

**190. Senior Seminar (4)**

A research seminar on special topics of interest to available staff provides majors and minors in sociology with research experience in close cooperation with faculty. *Prerequisites:* senior standing plus three sociology courses or consent of instructor. May be repeated for credit provided that the student take seminars on different topics.

**196A. Honors Seminar: Advanced Studies in Sociology (4)**

This seminar will permit Honors students to explore advanced issues in the field of sociology. It will also provide Honors students the opportunity to develop a senior thesis proposal on a topic of their choice and begin preliminary work on the Honors thesis under faculty supervision.

**196B. Honors Seminar: Supervised Thesis Research (4)**

This seminar will provide Honors candidates with the opportunity to complete research on and preparation of a senior Honors thesis under close faculty supervision.

**198. Directed Group Study (4)**

Group study of specific topics under the direction of an interested faculty member. Enrollment will be limited to a small group of students who have developed their topic and secured appropriate approval from the departmental committee on independent and group studies. These studies are to be conducted only in areas not covered in regular sociology courses. *Prerequisites:* upper-division standing and permission of the department. (P/NP grades only.)

**199. Independent Study (4)**

Tutorial: individual study under the direction of an interested faculty member in an area not covered by the present course offerings. Approval must be secured from the departmental committee on independent studies. *Prerequisites:* upper-division standing and permission of the department. (P/NP grades only.)

**Graduate**

**200. Pre-Modern Sociological Theory (4)**

Major figures and their ideas in the history of social thought prior to the late nineteenth-century classicists.

**201. Modern Sociological Theory (4)**

A comparative examination of major themes of such classical sociological theorists as Marx, Durkheim, Weber, Simmel, G.H. Mead, and Park.

**202. Contemporary Sociological Theory (4)**

Major trends in American and European sociological theory since World War II with particular emphasis on such schools as structural functionalism, symbolic interaction, ethnomethodology, structuralism, and neo-Marxism.

**203. Field Methods (4)**

Research will be conducted in field settings. The primary focus will be on mastering the problems and technical skills associated with the conduct of ethnographic and participant observational studies.

**204. Sociolinguistic and Micro-Sociological Methods (4)**

The analysis of communication materials using sociolinguistics, psycholinguistics, and the methods of ethnoscience as well as general question-answer systems as they are related to the logic of social inquiry.

**205. Survey and Demographic Methods I (4)**

This course covers some of the elementary techniques used 1) to select random samples, 2) to detect statistical patterns in the sample data, and 3) to determine whether any patterns found in sample data are statistically significant. The course also stresses the benefits and drawbacks of survey and demographic data and some common ways in which these data are used incorrectly.

**206. Survey and Demographic Methods II (4)**

The course covers some of the more advanced techniques used 1) to select random samples, 2) to detect statistical patterns in the sample data, and 3) to determine whether any patterns found in sample data are statistically significant. The course also stresses the benefits and drawbacks of survey and demographic data and some common ways in which these data are used incorrectly.

**207. Comparative-Historical Methods (4)**

A broad-based consideration of the use of historical materials in sociological analysis, especially as this facilitates empirically oriented studies across different societies and through time.

**208. Orientation to Faculty (4)**

An introduction to entering graduate students to the range and variety of research and scholarly interests of the department's faculty. Through this introduction students will be better able to relate their own research interests and professional objectives to the ongoing work of faculty.

**210. Sociology of Health and Illness (4)**

A close-in examination of the effect of cultural, social structural and interactional factors in the diagnosis, treatment, and outcome of illness experiences in contemporary society. Class discussions are organized around a series of readings designed to parallel the phases of the natural history of an illness.

**212. Social Stratification (4)**

The causes and effects of social ranking in various societies. Theories of stratification; the dynamics of informal social grouping; determinants of institutional power, and the nature of struggles for power; the distribution of wealth and its causes; the dynamics of social mobility; the effects of stratification on life-styles culture, and deviance.

**214. Social Psychology (4)**

Emphasis in this seminar is two-fold: 1) ways in which the sociologists' approach to social psychology can be used to guide data collection and analysis in numerous areas of investigation; and 2) a critical appraisal of alternative theories of the interaction between the individual and society, as well as possible conceptual rapprochement among them.

**216. Sociology of Culture (4)**

The history of the concept of culture as the cultivation of symbolic distinctiveness in human groups; cultural pluralism in advanced industrial societies; the differentiation of cultural institutions: art, science, education and communication as

profit and nonprofit-making enterprises; cultural policy and social structure; culture as a property of social groups; conflict and accommodation over efforts to change and sustain traditional culture.

**218. Sociology of Organizations (4)**

An examination of sociological theories of organizational structure and functioning. Critical attention to theories and ideologies of management in bureaucratic organizations. The historical and structural context within which bureaucratic modes of organization emerge and flourish.

**220. Deviant Behavior (4)**

A critical comparison of current theories of deviant behavior, their application to the variety of such behaviors, as well as their historical antecedents. Also covered will be the political aspects of deviant designation, the creation of deviant sub-cultures, as well as interaction within them and with the larger society.

**222. Social Movements (4)**

An examination of theories accounting for the causes and consequences of social movements, including a discussion of the strengths and weaknesses of such theories for understanding historically specific revolutions, rebellions, and violent and nonviolent forms of protest in various parts of the world.

**224. Sociology of Development (4)**

Analysis of the interplay among economic, political, social, and cultural forms of modernization, especially in societies that have been going through early phases of industrialization in the post-World War II era.

**230. Advanced Studies in Contemporary Theory, Part I (4)**

The first week of this seminar would be devoted to Parsons and would continue with various American theorists (including Coser, Homans, and Blumer) and the work of Dahrendorf. Such contemporary European theorists as Habermas, Luhmann, Turin, and maybe Giddens will be included in the study as well as several contemporary American neo-Marxists.

**231. Advanced Studies in Contemporary Theory, Part II (4)**

This seminar will focus on microsociological theory and ethnomethodological studies of the local production of order in and as ordinary society. Lectures will concentrate on some consequential findings that are distinctive to ethnomethodological studies. These findings include several identifying issues of the problem of social order. In these findings, ethnomethodology is carrying out sociology's vision of the problem of order by respecifying the ordinary society. Perhaps ethnomethodology's findings thereby point to its past developments for the classic social sciences by specifying them, contra the sciences, as professional social analysis in and as ordinary society.

**232. Advanced Issues in the Sociology of Knowledge (4)**

This seminar examines the social construction and acquisition of "knowledge" in society and the social institutions in which these processes take place. It investigates the foundations of "knowledge" in society, its structuring through social interaction, and the relationship between knowledge and social institutions. The seminar also examines contrasting theories of knowledge found in sociological, semiotic, and anthropological studies. Emphasis will be placed on the analysis of specialized and folk theories of knowledge and group ideologies in historical context. The objective of this seminar is to develop a corpus of interdisciplinary concepts and tools for the critical analysis of knowledge, its use, and its dissemination in society.

**235. Communism (4)**

This course will examine the ideological framework of communism and historical attempts to realize its ideal goals. The experiences of the Soviet Union and other communist societies will be discussed, with attention to issues such as change in communist systems, varieties of communism, the role of ideology, and economic and political reform.

**240. Ethnomethodology (4)**

Topics will include the philosophical origins of ethnomethodology as a social perspective; the epistemological basis of interactional approaches to social behavior in sociology and related disciplines; the role of language use in social contexts; forms of common sense reasoning in everyday life; the interpretation of normative rules; the interaction of different modes of reasoning in particular social settings.



## TEACHER EDUCATION PROGRAM

### 241. Cognitive and Linguistic Aspects of Social Structure (4)

Introduction to topics in speech act theory, cognitive approaches to story grammars, and the analysis of conversational or discourse material as they apply to the study of social interaction and organization structures.

### 242. Advanced Topics in Cognitive and Linguistic Aspects of Social Structure (4)

An advanced seminar dealing with field and quasi-experimental methods for studying discourse and textual materials. Students are expected to conduct their own field research in natural organization settings.

### 250. Marriage, Family, and Relations between the Sexes (4)

Theory, research methods, and micro and macro research findings in the family field as they relate to other substantive areas in sociology. Special consideration given current concerns — sex roles, aging, and alternative life-styles.

### 260. Sociology of Religion (4)

The seminar will examine in detail one or two major issues in the anthropology of religion, as for example a theoretical problem like secularization and social change or a more substantive one like shamanism. Students will be notified in advance regarding the seminar topic.

### 270. The Sociology of Education (4)

A consideration of the major theories of schooling and society, including functionalist, conflict, critical and interactional; selected topics in the sociology of education will be addressed in a given quarter, including the debate over inequality, social selection, cultural reproduction and the transition of knowledge, the cognitive and economic consequences of education. Major research methods will be discussed and critiqued.

### 271. Seminar in Classroom Interaction (4)

Sociolinguistic principles are applied to the study of classroom interaction. Research methods, including media methods, that are applicable to interaction in general, educational settings in particular, are discussed and applied. Videotape from actual school settings form the basis of preliminary presentations. Student projects will be based on videotape of actual classrooms whenever possible.

### 280. Sociological Writing (4)

This seminar involves (1) reading and discussion on how to write sociology with clarity, precision, and rhetorical force, and (2) close, line-by-line criticism and editing of student papers. At the beginning of the quarter, each student must submit a paper he or she has recently written. At the end of the quarter, it will have been re-written in light of the discussion of it in the seminar.

### 290. Graduate Seminar (4)

A research seminar in special topics of interest to available staff, provides majors and minors in sociology with research experience in close cooperation with faculty. (S/U grades permitted.)

### 298. Independent Study (1-4)

Tutorial individual guides study and/or independent research in an area not covered by present course offerings. (S/U grades permitted.)

### 299. Thesis Research (1-2)

Open to graduate students engaged in thesis research. (S/U grades permitted.)

### 500. Apprentice Teaching (2-4)

Supervised teaching in lower-division contact classes, supplemented by seminar on methods in teaching sociology. (S/U grades only.)

## SUBJECT A

For information on the Subject A requirement, please refer to "Subject A: English Composition" in the catalog section, "Academic Regulations."

Students who have not satisfied the Subject A requirement before enrolling at UCSD must satisfy the requirement by achieving a grade of C or better in SDCC 1 (English Composition — Subject A) and by passing the Subject A Exit Examination given at the end of SDCC 1. That examination is administered by the Subject A Program office. Students should enroll in SDCC 1 during the first quarter of residence at UCSD, or as soon thereafter as space is available in the course. SDCC 1 is a Mesa College course taught at UCSD as part of a cooperative program with the San Diego Community College District.

Under Academic Senate regulations, SDCC 1 cannot be counted towards graduation requirements; however, the course units do count as workload credit towards the minimum progress requirement and eligibility for financial assistance.

For further information about the Subject A requirement or the Proficiency Test, please visit the Subject A Program office, Humanities/Undergraduate Library Bldg. 1523, or call (619) 534-6177.

## TEACHER EDUCATION PROGRAM

OFFICE: Third College Social Science Building, Third College

### Professors:

Richard C. Atkinson, Ph.D. *Professor of Psychology (Chancellor)*

Aaron Cicourel, Ph.D. *Professor of Sociology*

Michael Cole, Ph.D. *Professor of Psychology and Communication*

Charles Cooper, Ph.D. *Professor of Literature*

Jean Mandler, Ph.D. *Professor of Psychology*

Hugh Mehan, Ph.D. *Professor of Sociology (Program Coordinator)*

Frederick Olafson, Ph.D. *Professor of Philosophy*

James Wertsch, Ph.D. *Professor of Communication*

### Associate Professor:

Susan Shirk, Ph.D. *Associate Professor of Political Science*

### Assistant Professor:

Barbara Tomlinson, Ph.D. *Assistant Professor of Literature*

### Lecturers:

Rosa M. Diaz, M.A. *Lecturer, Supervisor, Teacher Education*

Gloria Fimbres, M.A. *Lecturer, Supervisor, Teacher Education*

Cynthia Lawrence-Wallace, Ph.D. *Lecturer, Supervisor, Teacher Education*

Randall Souviney, Ph.D. *Lecturer, Associate Coordinator*

The Teacher Education Program offers three programs of study. The first leads to the California Multiple Subjects Credential, the second, the Single Subjects Internship Credential Program (to teach mathematics and life sciences) and the third, a Masters of Arts in Teaching and Learning.

## The Credential Program

The Teacher Education Program (TEP) offers two multiple subjects credentials: a *preliminary* and a *clear* credential. The primary difference between the two credential plans is related to the academic background of the candidate prior to entering the program of professional study. The preliminary credential is undertaken at the undergraduate level, and the clear credential at the post-baccalaureate level.

The *preliminary* credential option is designed for undergraduate students only. Students who satisfy the requirements for the preliminary multiple subjects credential and who complete the requirements for a major are qualified to teach for five years in a *self-contained* classroom at levels kindergarten through twelfth grade. A fifth year of specified post-baccalaureate course work must be completed within five years of completion of the B.A. in order to obtain a *clear* credential. The clear credential is renewable every five years subject to certain renewal requirements.

The second credential option is for students who have completed the B.A. degree. Students satisfying entry requirements will work directly towards the clear multiple subjects credential. Students who satisfy the requirements for this credential are also qualified to teach in K-12 self-contained classrooms with the same renewal requirements as above. The course requirements for both credential plans are identical, with the exception of additional health and special education mainstreaming requirements needed for the clear credential.

The main themes of the TEP are multicultural and child-centered education. A

## SPANISH LITERATURE

See Literature.



multicultural education is pluralistic; it recognizes the unique heritage of different cultures and seeks to preserve each child's cultural identity while providing the child with skills necessary to move between different cultural systems if he or she chooses to do so.

A child-centered education is constructed to be consistent with each child's developmentally acquired ability to learn. Current research in comparative cultures, comparative child development, and social interaction will provide the prospective teacher with insight into the relationship among language, culture, and education.

**Bilingual Emphasis.** Recognizing the need for bilingual teachers with a multicultural perspective, TEP offers a bilingual emphasis program within the framework of the multiple subjects credential. This program is designed for students interested in and capable of conducting instruction in two languages. While this emphasis is suitable for all students with expertise in English and any other language, the present expertise of the UCSD faculty and immediate need of the San Diego community make Spanish-English the most highly developed combination. Students will be required to pass the Language/Cultural/Teaching Methods Proficiency Exam and complete preliminary fieldwork and student teaching in a bilingual classroom.

Students who complete the bilingual emphasis program will receive a multiple subjects credential which specifies "Bilingual Emphasis." This certification meets the Ryan Act requirements for bilingual teachers.

## Curriculum

The state requires that elementary teachers be prepared to instruct all the courses normally taught at each level. This necessitates diverse professional preparation as well as practical classroom experience. TEP meets these requirements as follows:

### Academic Area Requirement

The academic area requirement is intended to provide the credential candidate the subject matter knowledge needed to teach all content areas in the elementary curriculum. This is *not* a substitute for the student's regular major. These requirements should be completed prior to starting the professional preparation component of the program. The teacher candidate must take a minimum of five four-quarter unit courses in *each* of the following areas: (1) mathematics, science

and computer applications, (2) English and literature, (3) social sciences, and (4) humanities, foreign languages, fine arts, and history. University general-education requirements at UCSD satisfy many of these requirements. Courses are offered in each of these four areas which enable the teacher candidate to work as a classroom aide in the respective discipline in a local school. (See *TEP 181A, B, C.*) The classroom aide experience is seen as an excellent vehicle for learning about the learning processes and interpersonal communication involved in a teaching relationship.

### Professional Preparation

The state requirement for professional preparation will be met by offering eighteen quarter-hours of courses which deal with the sociology and psychology of education and innovative instructional practices. Details of these courses follow in the course listing.\*

### Practical Classroom Experience

The teacher candidate will student-teach for the equivalent of one elementary school semester. During this time the candidate will be given thorough, realistic, and practical experience in classroom instruction, and will be given continuous and diversified responsibilities in the school. The teacher candidate will engage in classroom observation, course preparation, actual teaching, and student evaluation. Concurrent with student teaching, the teacher candidate must take TEP 191C, described below.

### Student Selection

Students interested in applying to the TEP for the *preliminary credential* are advised in their sophomore or junior year about the courses they should take in their junior and/or senior year. Candidates for the *clear credential* generally enroll as limited status students, although concurrent enrollment through UCSD Extension is available on approval. Student performance in these courses will be a factor in program selection. Other criteria for admission to the program include:

1. A strong interest in multicultural approaches to education; a strong desire to improve the quality of American education; a strong desire to instruct students as self-activated learners.
2. Experience working with students in educational environments, especially in multicultural settings.
3. Community involvement.
4. Academic excellence.

Prospective candidates for the TEP will be carefully reviewed by a diversified committee composed of faculty, staff, and TEP alumni. Formal acceptance into the TEP normally takes place at the end of the fall quarter. All candidates must take the California Basic Education Skills Test (CBEST) prior to acceptance in the program.

## Elementary Aide Program

The UCSD Elementary Aide Program enables students to engage in classroom aide activity in elementary schools. The program provides a vehicle for students to gain practical experience about the learning process in actual classrooms and to relate this experience to theories of interpersonal relations, cross-cultural communications and education. The courses in the program are open to all UCSD students. The student must serve as an aide for a total of three quarters. The prerequisite for all three courses is consent of the instructor. (See TEP 181-A-B-C below.)

## The Minor Program

The Teacher Education Program offers a minor in teacher education which can be fulfilled through the four colleges. Details can be obtained from the college academic advisers or from the TEP adviser.

## The Single Subjects Internship Credential Program

Plans are under way to introduce a Single Subjects Internship Credential Program in the fall of 1987 which would qualify graduates to teach mathematics and life sciences in grades seven-twelve. Contact the TEP office for further information.

## The Graduate Program

The teaching and learning course group offers a course of study leading to a master of arts degree. The goal of this M.A. program is to address issues of quality of public education by developing in professional educators the theoretical, methodological, and pedagogical skills necessary to conduct basic research on the educational circumstances they confront. The M.A. course of study is designed to assist professional educators in elementary and secondary schools to adopt a research perspective toward teaching. In this way, educators can adapt their knowledge to the complex and constantly changing demands of schools and society.

## TEACHER EDUCATION PROGRAM

Participants in the M.A. program will be given the opportunity to advance their knowledge of the teaching-learning process, the social organization of schooling, and the relation of schooling to society. They will be provided basic preparation in appropriate research methods and will design and implement a research project on some aspect of the teaching-learning process.

### Admissions to the Program

The following are entrance requirements:

1. current teaching or educational assignment for the duration of the graduate program;
2. a B.A. from an accredited institution with a minimum 3.0 GPA;
3. a current California teaching credential;
4. a recent Graduate Record Exam (GRE);
5. fluency in a foreign language or a computer language is required.

Students will apply during the winter quarter, and will begin study in the spring quarter.

### Residence

Full-time students must be enrolled for twelve units a quarter during the course of study. Part-time students must be enrolled for six units a quarter.

### Course of Study

The M.A. program has three strands (1) theories of teaching and learning (twelve quarter-units), (2) research methods (twelve quarter-units), (3) instructional practices (twelve quarter-units).

**Theory Sequence.** Twelve units from among the following: Psychology 216, Basic Seminar in Comparative Cognitive Research; Psychology 259A-B-C, Advanced Seminar in Comparative Cognitive Research; Sociology 270, The Sociology of Education; Sociology 271, Seminar in Classroom Interaction; Sociology 241, Cognitive and Linguistic Aspects of Social Structure; Sociology 242, Advanced Topics in Cognitive and Linguistic Aspect of Social Structure; Lit/Writing 271, Theory and Practice of College Writing Instruction; Lit/Writing 272, Research on Composing and Written Discourse; Lit/Writing 273, Practicum on Research in Composing and Written Discourse; Political Science 166CA-CB, Politics of Education; Psychology 211, Piagetian Theory; Communication 114, Bilingual Communication; or other courses approved by the program coordinator.

**Research Methods Sequence.** Eight units from among the following: TEP 220, Research Design for Educational Inquiry; TEP 295, M.A. Thesis; Four units from among the following or other courses approved by the program coordinator: TEP 290, Research Practicum; TEP 297, Directed Group Study; TEP 298, Independent Study.

**Instructional Methods.** Twelve units from among the following, or other courses approved by the program coordinator: TEP 230, Curriculum Design; TEP 231, Instructional Practices; TEP 162/Computer Applications in Teaching and Learning; Lit/Writing 141, The Process of Writing; Lit/Writing 142, Forms of Written Discourse; Lit/Writing 144, The Teaching of Writing.

### Specializations

The special expertise of the M.A. Course Group enables students to specialize in three areas of concentration: bilingual education, interactive technology and the writing process. Students choosing to specialize in these areas should take the following courses:

#### Bilingual Specialization

1. 3 courses in theory
2. 3 courses in research methods
3. Comm 114 (Diaz), TEP 230 (Fimbres), and Lit/Sp 261 (Sanchez)
4. or other courses approved by the program coordinator

#### Interactive Technology Specialization

1. 3 courses in theory
2. 3 courses in research methods
3. TEP 162, TEP 182A-B-C
4. or other courses approved by the program coordinator

#### The Writing Process

1. 3 courses in theory
2. 3 courses in research methods
3. Lit/Writing 141, 142, 144
4. or other courses approved by the program coordinator

### Sample Program

A student's typical course schedule would look like the following:

|                  | Spring  | Summer  | Fall     |
|------------------|---------|---------|----------|
| Theory           | SOC 271 |         | PSY 259A |
| Research Methods |         | TEP 220 | TEP 290  |
| Instr. Methods   | TEP 162 | TEP 230 |          |

|                  | Winter   | Spring  | Summer  |
|------------------|----------|---------|---------|
| Theory           | PSY 259B |         |         |
| Research Methods | TEP 290  | TEP 295 | TEP 295 |
| Instr. Methods   |          | TEP 231 |         |

## Courses

The following courses are offered by the TEP faculty. Students are advised to consult with TEP staff to determine which courses are required for the credential programs and how to fulfill the academic area requirement. Courses required as part of diversified area requirement or credential professional preparation are designated \*. Undergraduate students may enroll in graduate seminars with the consent of instructor.

### Upper Division

#### Communication 114. Bilingual Communication (4)

This course is designed to introduce students to recent research techniques in bilingual communication. Students will begin by analyzing the different settings. The course will then turn to methods of assessing the processes and strategies of communication. These activities will primarily include observations of video-taped bilingual and monolingual communicative interactions in classrooms and tutorial lessons in the analysis of video tape records of such interactions. S. Diaz

#### Lit/Writing 141. The Process of Writing (4)

A study of writing as a creative process. Review of research on creativity and on the writing process, and analysis of writers' introspective accounts of their work. Delineation of the stages in the writing process, and exploration of implications for learning to write. C. Cooper

#### Lit/Writing 142. Forms of Written Discourse (4)

A review of current rhetorical theory and discourse theory. Some attention to recent developments in text linguistics. Students will write several discourse types and explore differences among the types, with special attention to differences for the writing process and for the structure of the written discourse itself. C. Cooper

#### Lit/Writing 144. The Teaching of Writing (4)

Wide reading in current theory and practice of teaching writing in schools and colleges. Careful attention to various models of classroom writing instruction and to different approaches in the individual conference. Students in the course may observe instruction in the UCSD college writing programs or tutor freshman students in those programs. *Prerequisite: consent of instructor.* B. Tomlinson

#### \*Psychology 130. Developmental Psychology and Education (4)

An introduction to the child's cognitive, perceptual, linguistic, and social development with emphasis on his or her relation to education. Piagetian, information processing, and cross-cultural difference in relation to education and the nature of the learning process in relation to success and failure in the schools. *Prerequisite: consent of instructor.* (W) J. Mandler

#### \*Sociology 126. Social Organization of Education (4)

The social organization of education in the U.S. and other societies; the functions of education for individuals and society; the structure of schools; educational decision making; educational testing; socialization and education; formal and informal education; cultural transmission. *Prerequisites: Soc. 1A-B or Soc. 2 or consent of instructor.* (S) H. Mehan

#### \*Sociology 117. Language, Culture, and Education (4)

The mutual influence of language, culture, and education will be explored; explanations of students' school success and failure that employ linguistic and cultural variables will be considered; bilingualism, cultural transmission through education. *Prerequisites: Soc. 1A-B or Soc. 2 or consent of instructor.* (F) H. Mehan

**TEP 141A-B-C. Child Study Practicum (4-4-4)**

Designed to enhance understanding of normal child development from birth to age five through direct observation of linguistic, cognitive, and social development. Observational assignments will help students link theories of development to early childhood experiences and education. *Prerequisite: consent of instructor.*

**\*TEP 162. Computer Applications in Teaching and Learning (4)**

This course introduces students to microcomputers viewed as a component of interactive communication media. Students will acquire application skills and hands-on experience with microcomputers and computer networks, examining the possible impact of these new media on the teaching/learning process. The course assumes a basic familiarity with social science concepts and the logic of social science inquiry. *Prerequisite: upper-division standing or consent of instructor.* (F,W,S) R. Souviney

**\*TEP 180 A and B. Practicum in Student Teaching (9-9)**

The teacher candidate will be assigned to a classroom in one of the participating schools under the supervision of a participating master teacher. The candidate will begin teaching in the first week of September and will spend at least six hours a day five days a week for fifteen weeks in the classroom. The experience is designed to give the candidate thorough practical classroom experience and diversified responsibilities. *Prerequisites: confirmed TEP candidacy and concurrent registration in TEP 191C.* (F) Staff

**\*TEP 181A-B-C. Practicum in Learning (4-4-4)**

The primary focus of these courses will be on the teaching-learning process in elementary schools. UCSD students are assigned to instruct a small number of elementary school students under the supervision of participating teachers in local schools. The UCSD student will instruct children in reading, ESL, English, Spanish, social science, math., science, history, or fine arts, at least four to six hours per week. Concurrent with field activity, the UCSD student will be involved in course work concerning theories of learning, multicultural education, social organization of education. *Prerequisite: consent of instructor.* (F,W,S) Staff

**TEP 182A-B-C. Practicum in Interactive Computing (4-4-4)**

The course focuses on interactional computing in teaching-learning and communicative situations. Course work concentrates on interactive computing, application to teaching, learning, bilingualism, and communication. Concurrent with course work, students are assigned to a school or community field site implementing interactive computing. Students will write research reports integrating course work and field experience. *Prerequisite: TEP 162 or consent of instructor.* (F,W,S) Staff

**TEP 190. Research Practicum (1-6)**

Supervised research studies with individual topics selected according to students' special interests. Students will develop a research proposal and begin to gather and analyze data. *Prerequisite: consent of instructor.* (F,W,S) Staff

**\*TEP 191A. Innovative Instructional Practices (6)**

This is one of a three-course sequence providing pedagogical methods for teaching. Diverse subject areas are integrated into a single intercurricular course of study by emphasizing activity/inquiry techniques of instruction. *Prerequisite: confirmed teacher candidacy.* (W) Staff

**\*TEP 191B. Innovative Instructional Practices (6)**

This is one of a three-course sequence providing a theoretical and practical grounding in various pedagogical techniques for teaching. Students pursuing the bilingual emphasis are provided instruction in bilingual teaching techniques within the framework of the course. *Prerequisites: TEP 191A.* (S) Staff

**\*TEP 191C. Innovative Instructional Practices (2)**

This is one of a three-course sequence providing pedagogical techniques for teaching. This course is held concurrently with student teaching. *Prerequisites: TEP 191A-B and concurrent registration in TEP 180.* (F) Staff

**TEP 192A. Bilingual Instructional Practices (4)**

History and models of bilingual education; sociocultural issues associated with second language instruction, legal requirements for public school bilingual programs, native language, and ESL teaching methods. *Prerequisite: confirmed TEP candidate or consent of instructor.* (W) G. Fimbres

**TEP 192B. Bilingual Instructional Practices (4)**

This is the second in a two-course sequence. Topics addressed include: advanced methods of instruction for bilingual classrooms; teaching in content areas; curriculum development, especially in language arts; technical teaching vocabulary; integrating bilingual and multicultural educational approaches. *Prerequisite: confirmed TEP candidate or consent of instructor.* (S) G. Fimbres

**\*TEP 193. Multicultural Education (4)**

An historical overview of cultural, ethnic diversity in American society; identification of forces which contributed to the schools' recognition of that diversity; a study of theories and conceptual approaches which influence the development of multicultural education programs and activities; an examination of curriculum programs and teaching strategies which reflect various conceptualizations of multicultural education. *Prerequisite: confirmed TEP candidate or consent of instructor.* (W) C. Lawrence-Wallace

**TEP 195. Apprentice Teaching (4)**

Advanced TEP students are prepared in effective methods of supervising the preparation of UCSD students serving as paraprofessionals in elementary school classrooms. Topics covered include: classroom management, interpersonal relations, supervision techniques, multicultural education, politics in the school, and curriculum development. Each student serves as a discussion leader, and conducts at least two workshops. *Prerequisite: consent of instructor.* Staff

**TEP 196. The Psychology of Teaching and Structure of Information for Human Learning (0 or 4)**

College students tutoring college students. Curriculum: basic applied learning principles, specifying objectives, planning and designing instruction, testing, evaluation, interpersonal communication skills, study skills. Objectives will be assessed by project completion and practicum feedback. This course is not creditable toward professional preparation requirements for the multiple option credential. *Prerequisite: consent of instructor.* L. Corona

**TEP 198. Directed Group Study (4-2)**

Directed group study, guided reading and study involving research and analysis of activities and services in multicultural education, bilingual education, the teaching-learning process, and other areas that are not covered by the present curriculum. *Prerequisite: consent of instructor.* Staff

**TEP 199. Special Studies (4)**

Individual guided reading and study involving research and analysis of activities and services in multicultural education, bilingual education, the teaching-learning process, and other areas that are not covered by the present curriculum. *Prerequisite: consent of instructor.* Staff

## Graduate

**Lit/Writing 271. Theory and Practice of College Writing Instruction (4)**

In this course we will explore the implications for writing and instruction of current discourse theory and of linguistics (sentence level and text level). We will also review research on writing instruction and look carefully at several models of classroom instruction and individual conferencing. C. Cooper

**Lit/Writing 272. Research on Composition and Written Discourse (4)**

This course will survey current research on composing and written discourse and direct students in research projects involving the analysis of writing. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process. *Prerequisite: consent of instructor.* C. Cooper

**Lit/Writing 273. Practicum on Research in Composing and Written Discourse (4)**

In this course students will design and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process. B. Tomlinson

**Psychology 211. Piagetian Theory (3)**

Seminar on selected topics in Piaget's theory of cognitive development. *Prerequisite: consent of instructor.* J. Mandler

**Psychology 216. Basic Seminar in Comparative Cognitive Research (4)**

This seminar will review current research and theory in cognitive psychology in order to characterize group differences in cognitive functioning. M. Cole

**Psychology 259A-B-C. Advanced Seminar in Comparative Cognitive Research (3-3-3)**

An examination of the major theories and relevant data concerning the way in which culturally organized experience influences the nature of thinking. Particular attention will be paid to understanding the presumed relations between culture and thought. M. Cole

**Sociology 241. Cognitive and Linguistic Aspects of Social Structure (4)**

Introduction to topics in speech act theory, cognitive approaches to story grammars, and the analysis of conversational or discourse material as they apply to the study of social interaction and organizational structures. A. Cicourel

**Sociology 242. Advanced Topics in Cognitive and Linguistic Aspects of Social Structure (4-4)**

An advanced seminar dealing with field and quasi-experimental methods for studying discourse and textual materials. Students are expected to conduct their own field research in natural or organizational settings. A. Cicourel

**Sociology 270. The Sociology of Education (4)**

A consideration of the major theories of schooling and society, including functionalist, conflict, critical, and interactional; selected topics in the sociology of education will be addressed in a given quarter, including: the debate over inequality, social selection, cultural reproduction and the transition of knowledge, the cognitive and economic consequences of education. Major research methods will be discussed and critiqued. H. Mehan

**Sociology 271. Seminar in Classroom Interaction (4)**

Sociolinguistic principles are applied to the study of classroom interaction. Research methods, including media methods, that are applicable to interaction in general, educational settings in particular, are discussed and applied. Videotape from actual school settings form the basis of discussion. Student projects will be based on videotape of students' own classrooms, whenever possible. H. Mehan

**TEP 220. Research Design for Educational Inquiry (6)**

An introduction to descriptive and inferential statistics research design techniques appropriate for research in educational settings, including interview, observation, audio visual and testing which lead to inferences about teacher-student interaction, classroom organization, curriculum design, and the relationship of the classroom to the school, the community and society. Experience with computer supported statistics packages is included as part of the course requirements. *Prerequisite: M.A. candidate or consent of instructor.* H. Mehan or R. Souviney

**TEP 230. Curriculum Design(4)**

General principles of curriculum design particularly appropriate for classroom instruction. Consensus vs. model building methods will be discussed using examples drawn from curriculum development efforts in various subject areas. Participants will carry out a curriculum project appropriate for their own classrooms. *Prerequisites: M.A. candidate, or consent of instructor.* G. Fimbres, R. Souviney, or C. Lawrence-Wallace

**TEP 231. Instructional Practices (4)**

Selected advanced topics focusing on the use of effective strategies and materials for elementary school instruction. Curriculum evaluation, pedagogy, classroom management and assessment will be explored. Participants will conduct an appropriate field-based project. *Prerequisites: M.A. candidate, or consent of instructor.* G. Fimbres, R. Souviney, or C. Lawrence-Wallace

**TEP 290. Research Practicum (1-6)**

Supervised research studies with individual topics selected according to students' special interests. Students will develop a research proposal appropriate for M.A. thesis, begin to gather and analyze data. *Prerequisites: M.A. candidate, and consent of instructor.* (S/U grades only.) Staff

**TEP 295. M.A. Thesis (4)**

The student will work on the M.A. thesis under the direction of the students' thesis committee chairperson. *Prerequisites: M.A. candidate, and consent of committee chairperson.* (S/U grades only.)

**TEP 297. Directed Group Study (1-6)**

Study and analysis of specific topics under the guidance of a faculty member. Offered for repeated registration. *Prerequisite: consent of instructor.* Staff

## THEATRE

### TEP 298. Independent Study (1-6)

Individual guided study and/or independent research in an area not covered by present course offerings. Offered for repeated registration. Prerequisite: consent of instructor. Staff

## THEATRE

OFFICE: 2550 Humanities/  
Undergraduate Library Building,  
Revelle College

### Professors:

Michael Addison, Ph.D.  
Floyd Gaffney, Ph.D.  
Robert Israel, M.F.A.  
Adele Shank, M.F.A. (Chairwoman)  
Arthur Wagner, Ph.D.

### Associate Professors:

Mary Corrigan, M.A.  
Frantisek Deak, Ph.D.  
Deborah Dryden, M.F.A.  
Jorge Huerta, Ph.D.  
Luther James  
Walton Jones, M.F.A.  
Steven Pearson, M.F.A.  
Jonathan Saville, Ph.D.

### Associated Faculty:

Helene Keysar, Ph.D. (Communication)

### Adjunct Faculty:

Quinn Martin

## The Undergraduate Program

The curriculum in the Department of Theatre has been developed to provide (1) an integrated program for students desiring a theatre major; (2) a sequence of courses to fulfill the fine arts and/or humanities requirements in Revelle, Muir, and Third Colleges; (3) a series of courses fulfilling Revelle and Warren College minor requirements; and (4) elective courses for the general student desiring experiences in theatre.

## THE THEATRE MAJOR

The program for a theatre major is designed to introduce the student to a broad base of theatrical experiences within a liberal arts context. The required lower-division courses prepare the student for a variety of upper-division specialties which the student selects in consultation with a theatre faculty adviser. The theatre major prepares those students who wish to pursue graduate study with a solid artistic and academic background. The requirements for the major are:

Theatre 12. Introduction to Performance  
Theatre 42. Drama Survey: Tragedy  
Theatre 43. Drama Survey: Modern  
Theatre 44. Drama Survey: Comedy  
Theatre 70A-B-C. Theatre Production  
Theatre 131. The Art of Directing  
Theatre 189. Major Seminar. Required every quarter.

One theatre course in History of Theatre (to be taken from Theatre 160, 161, 162) and a second course in either the History of Theatre or Visual Ideas series (to be taken from Theatre 160-169).

Two theatre courses in Dramatic Literature and Theory (to be taken from Theatre 140 through 146, 148, 149).

One theatre course in Dance/Movement or Theatre 30, Theatre 17, or Theatre 153A.

Production Requirement (see below).

The remaining five required upper-division courses may be taken as upper-division electives, three of which can be taken outside the department with prior approval of the undergraduate adviser. A maximum of eight units of 180-183 may be applied toward this requirement.

### Production Requirement

Theatre 100, Theatre Studio, must be taken once each year for two units. (A combined total of twelve units of Theatre 100-104 will be counted toward graduation.)

NOTE: As the theatre program grows, there are necessary changes being developed in curriculum and theatre production. The theatre program is currently under review, and substantial changes may result. Students considering the theatre major should be sure to consult with the departmental undergraduate adviser to determine the exact details of the major at the time.

## THE THEATRE MINOR

Students should plan their minors and have them approved by the faculty undergraduate adviser prior to their junior year. Courses may not be taken on a Pass/Not Pass basis. Undergraduates may choose one of the seven theatre minors outlined below:

- Dramatic Literature and History: Theatre 42, 43, 44 plus three upper-division courses in dramatic literature or history.
- Theatre Technology and Design: Theatre 70A,B,C, plus three upper-division courses in technical theatre and/or design. One course from Theatre 102-106

may be counted as one of the three upper-division courses.

- General Theatre Minor: Theatre 11, 12, 13 plus three upper-division theatre courses. One course from Theatre 102-106 may be counted as one of the three upper-division courses by special petition in consultation with the proposed instructor.
- Performance Minor: Lower-division requirements are Theatre 12 and 30 and ONE from Theatre 17, 18, 35 or other theatre voice or movement course. Students must choose three upper-division courses in acting from the following list: Theatre 122-126, 130A-B, 132, 133A-B, 136, 137, 138A-B, 180, 186, 187A-B. One course from Theatre 102-106 may be counted as one of the three upper-division courses by special petition and in consultation with the proposed instructor. NOTE: Students may enroll in certain upper-division acting classes by audition only. If students who choose the performance minor do not gain admission to these upper-division courses, they may be directed to change to the general minor listed above and will need to check with the undergraduate adviser to do so.
- Ethnic Theatre Minor: Theatre 11, 15, 16 plus three upper-division courses from Theatre 125, 141, 142, 168, 187A-B (Black Theatre and/or Chicano Theatre).
- Playwriting Minor: Theatre 42, 43, 44, 153A, 153B, and 154.
- Revelle College Noncontiguous Minor: (Revelle students only) Revelle College undergraduates may choose from the six minors listed above, or they may design a noncontiguous minor as follows: six theatre courses, three of which must be upper-division. **Students must have their selection of courses approved by the theatre faculty adviser prior to the junior year.**

**NOTE:** Theatre 100, 101, 197, 198, 199 may not be used in the theatre minors as upper-division electives.

## The Graduate Program — M.F.A. in Theatre

The Department of Theatre has set an ambitious goal for its M.F.A. program: the training of artists who will shape the future direction of the theatre. Students at UCSD must be curious about their art. The essential questions they ask are only as



good as their knowledge of the art form, including its conventions.

The faculty believe that, for the most part, the proving ground for students is in production. In addition to regular studio instruction, the curriculum for all students is structured around a solid sequence of production experience in realism, verse drama, and contemporary texts.

The M.F.A. program at UCSD is built around the master-apprentice system of training. All the faculty are active professionals who teach at UCSD because of a shared commitment to training young artists. Instruction takes place not just in the classroom, but in theatres around the country where faculty, with students as assistants, are involved in professional productions, including those at the La Jolla Playhouse.

Students graduating from the M.F.A. program at UCSD should be prepared to take positions in the professional theatre in the United States and abroad. Students are now working in New York, in resident theatres, in the film and television industry, and in European repertory theatres. M.F.A. candidates in acting, design, directing, dramaturgy/criticism, playwriting, and theatre administration will complete at least ninety quarter-units of academic work during their tenure in the program. The UCSD Department of Theatre is a member of the League of Professional Theatre Training Programs.

## Courses

NOTE: For changes in major requirements and in course offerings implemented after publication, inquire at the office of the Department of Theatre.

### Lower Division

#### 11. Introduction to the Theatre (4)

A broad exposure to the experience of theatre. The course involves active participation in and discussion of the multiple elements of living theatre — including examination of the creative contribution of the playwright, the designer, the director, the actor and the critic.

#### 12. Introduction to Performance (4)

Beginning experiences in the process of acting: improvisations, exercises, preparation of scenes. Lectures and demonstrations relative to all laboratory work.

#### 13. Introduction to Design for the Theatre (4)

A survey of contemporary and historical concepts and practices in the visual arts of the theatre; studies in text analysis, studio processes, and technical production; elementary work in design criticism. A course parallel to Theatre 12, serving nonmajors as an introduction to theatre and majors as the first step in the design and production course sequence.

#### 15. Introduction to Contemporary Chicano Theatre (4)

A survey of the development of contemporary Chicano theatre from the indigenous roots in Aztec and Maya dance/drama to the emergence of the Teatro Campesino and other "teatros" in the mid 1960s. The course will focus on Chicano theatre as ritual and document, especially in the early "actos" of Luis Valdez and other Chicano theatre groups and playwrights.

#### 16. Introduction to Black Drama (4)

This course is designed to provide students with a meaningful and accurate definition of the black artist within the American theatre past, present, and future. Some quarters will deal with a single black artist, playwright, director, or actor.

#### 17. Introduction to Voice for the Theatre (4)

An introduction to the basic principles of voice production with particular emphasis on tonal qualities and ease of vocal production. The course will consist of selected relaxation and vocal exercises designed to free the organs of articulation. There will be selected text application.

#### 18. Introduction to Movement for the Theatre (4)

An introduction to the wide range of physical disciplines and techniques that enable the performer to use the body as an expressive medium in the theatre. Based on the principle that ideas precede images, the course will focus on methodologies that link text, analysis and understanding, and the physical extension into shaped and expressive movement through defined space.

#### 19. Introduction to Makeup for the Theatre (4)

This course introduces the student to fundamentals of makeup for the theatre; historical styles; development of makeup media; special effects derived from various materials; facial structure and basic makeup design; color and light in makeup; basic application theory and techniques.

#### 30. Beginning Acting (4)

Course designed to equip the actor with the basic tools necessary for further stage work. Lectures, exercises, and scene study. This course is prerequisite to Theatre 130A-B. Intermediate Acting. *Prerequisite: Theatre 12 and consent of instructor.*

#### 35. Speech for the Actor (4)

Course is taught with stage performance of spoken English in mind, rather than as an academic overview of human utterance. In particular, the goal of the course is to eliminate from the actors' speech all distortions so that the attention of an audience is on the textual content rather than any curious manner of speech. Dialect preferences and sub-standard inaccuracies are identified in the speech of the students as the entire English phoneme is taught, reviewed, and applied to the students' speech.

#### 42. Drama Survey: Tragedy (4)

A close examination of plays that reveal man as overreacher, as dreamer, as self-destroyer, and as both victim and victor in the conflict with his cosmos. *Prerequisite: sophomore standing.*

#### 43. Drama Survey: Modern (4)

A close examination of the texts of a selection of modern plays that draw from the tragic and comic traditions to generate theatre that reflects the modern consciousness. Particular consideration will be given to the multiple formalistic experiments of the twentieth century, ranging from expressionism to epic theatre. All of the plays dealt with will be viewed in terms of their realization in the theatre so that their full value as texts is understood. *Prerequisite: sophomore standing.*

#### 44. Drama Survey: Comedy (4)

Comic theatre as a revelation of man's refusal to endure fools and charlatans, and as a celebration of the vital forces of life. *Prerequisite: sophomore standing.*

#### 70A. Theatre Production (4)

One part of a three-part survey of technical production. This course focuses on the use of lighting and sound in theatre production, studied primarily in the context of UCSD theatre productions. *Prerequisite: Theatre 70A is a prerequisite for Theatre 172A, 172B (upper-division courses in lighting design).*

#### 70B. Theatre Production (4)

One part of a three-part survey of technical production. This course focuses on the use of scenery and properties in theatre production, studied primarily in the context of UCSD theatre productions. *Prerequisite: Theatre 70B is a prerequisite for Theatre 173A, 173B (upper-division courses in scene design).*

#### 70C. Theatre Production (4)

One part of a three-part survey of technical production. This course focuses on the use of costume and makeup in theatre production, studied primarily in the context of UCSD theatre

productions. *Prerequisite: Theatre 70C is a prerequisite for Theatre 176A, 176B (upper-division courses in costume design).*

NOTE: Theatre 11, 12, and 13 or Theatre 42, 43, and 44 will fulfill general-education requirements as follows: Muir College: fine arts requirement; Third College: humanities or fine arts requirement; Revelle: any theatre course will fulfill fine arts requirement.

### Upper Division

#### 100. Theatre Studio (2)

Development of an understanding of central elements of theatre production — including scenery, lighting, sound, costume and properties — through participation in the creation of UCSD Theatre presentations. Theatre majors are required to enroll in Theatre 100 or equivalent once each year for two units; a maximum of twelve units of Theatre 100, 101, 102, 103, and 104 may be used for graduation. Students must attend first class meeting to enroll in the course. *Prerequisite: consent of instructor.*

#### 101. Studies in Performance (0-4)

A course designed for the in-depth study of a particular play, its playwright, his or her times and milieu, culminating in a fully mounted presentation. Audition required. A combined total of twelve units of Theatre 100, 101, 102, 103, and 104 may count toward graduation. *Prerequisite: consent of instructor.*

#### 102. Studies in Technical Theatre (2 or 4)

A laboratory class in which students participate in the construction and operation of scenery for UCSD Theatre productions. During this class each student will be assigned scenic projects to follow through from start to finish. Each student will receive step by step guidance and direction in the assigned project for the production and will actively participate in the total process that transforms a designer's drawings into completed scenery. A maximum of twelve units of Theatre 100, 101, 102, 103, and 104 may count toward graduation. *Prerequisite: consent of instructor.*

#### 103. Studies in Costume Construction (2 or 4)

A laboratory class in which students participate in the construction of costumes for UCSD Theatre productions. During the course each student will be assigned a single costume or costumes to construct from start to finish. Each student will receive step by step guidance and direction on costume construction techniques and will actively participate in the total process that transforms a designer's sketch into a completed costume. A maximum of twelve units of Theatre 100, 101, 102, 103, and 104 may count toward graduation. *Prerequisite: consent of instructor.*

#### 104. Studies in Lighting and Sound (2 or 4)

Theatre 104 is a laboratory course in which students participate in the preparation and operation of lighting and sound equipment for UCSD Theatre productions. During this class, each student will be assigned lighting or sound projects to follow through from start to finish. Each student will receive step by step guidance and direction in lighting and sound methods used in theatre production and will actively participate in the total process that transforms a designer's drawings into stage lighting or sound. A maximum of twelve units of Theatre 100, 101, 102, 103 and 104 may count toward graduation. *Prerequisite: consent of instructor.*

#### 105. Studies in Production Management (4)

A production/performance-oriented course exercising the fundamental techniques of stage management, assistant directing, and promotion for theatrical production. Laboratory format culminating in fully mounted theatrical production. Interview required for admission. *Prerequisite: consent of instructor.*

#### 106. Studies in Dramaturgy (4)

The study of the dramatic text prior to production, including analysis of the text and historical research when applicable. Subsequently, the student will study the process of transformation of literary text into the theatrical production through participation in Department of Theatre productions from rehearsals to the completion of the work. *Prerequisite: Theatre 42, 43, 44 recommended.*

#### 110. Conservatory/Apprenticeship (12)

Concentrated studies in performance: Voice, speech, movement and acting, including laboratory work in conjunction with the UCSD Department of Theatre and the La Jolla Play-



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house. Laboratories under the supervision of the backstage and front-of-the-house staff of the La Jolla Playhouse. *Prerequisite: upper-division standing, resume, and two letters of recommendation (one letter from a theatre person, faculty, or professional).* Offered summer only.

### 117. Understanding Life Phenomena through Sociological Concepts and through Drama (4)

(Same as Sociology 177.) This course will compare, contrast, and where possible, synthesize the way in which sociologists attempt to understand the complexities of behavior in human life through the use of concepts and systematic investigation with the way dramatists attempt to distill and portray these same emotion-wrought situations. Major sociological concepts will be discussed and portions of well-established plays will be presented by theatre majors which illustrate these concepts in action. Lectures on the playwright's goals and dramatic components of the play, as well as generic applications of the concept to other areas of human group life will be offered as a catalyst to class discussion. Students will be assigned related readings in both sociology and theatre. *Prerequisite: one lower-division sociology course or consent of instructor.*

### 122. Studies in Dance Composition (4)

Examinations of skills and techniques required by various dance forms: modern, Afro-Cuban, jazz. The course will emphasize compositional studies through the development and presentation of student works. *Prerequisite: consent of instructor.*

### 124. Mime for the Theatre (4)

An introduction to the art of mime, based on the principles developed by LeCocq and Decroux, leading to individual mime compositions through the development of technique, characterizations, and mimetic awareness.

### 125. Dances of the World (4)

Course designed for in-depth study of the dance of a particular culture — Afro-Cuban, Bharata-Natyam, Balinese, Korean, etc. Specific topic will vary from quarter to quarter. May be repeated one time for credit. *Prerequisite: consent of instructor. Theatre 20 recommended.*

### 126. The Art of Movement: An Introduction (4)

Fundamentals of the art of movement as a basis for theatre, dance, the performing and visual arts, and as a research methodology for the analysis of movement. *Prerequisite: consent of instructor.*

### 130A-B. Intermediate Acting (4-4)

The process of acting, its theory and practice, examined through exercises, text analysis, and the preparations of scenes from the modern repertoire. Audition required. *Prerequisites: Theatre 30 and/or consent of instructor.*

### 131. Art of Directing (4)

An examination of the director's artistic and interpretive responsibilities and of the creative process that leads to that development of the theatre event. The course will lay emphasis on the historical evolution of the director as central artist in the theatre, as a means toward understanding the various artistic bases from which directors have moved in their work. Additionally, there will be a heavy concentration on the research, analysis, and textual preparation that is an essential part of directing for the theatre.

### 132. Acting Styles (4)

A studio exploration of various problems in acting style, including Greek tragedy, Renaissance, commedia dell'arte, Restoration comedy, melodrama, and Shavian comedy. *Prerequisites: Theatre 12, 30, 130A, B.*

### 133A-B. Acting for the Camera (4-4)

This two-quarter course is designed to sharpen the performer's basic dramatic abilities and aid in the transition from stage to film work. Examination of film production and its physical characteristics and the acting style needed for work in film and television. Explorations in staging on the movie set involving differing camera angles. Students will rehearse and perform in simulated studio settings. First quarter will deal with camera acting skills; second quarter will deal with applying those skills to specific text situations. *Prerequisites: Theatre 30, 130A-B, 133A for B. Consent of instructor.*

### 135A-B. Stage Management (4-4)

Discussion and research into the duties, responsibilities, and roles of a stage manager. Work to include studies in script analysis, communication, rehearsal procedures, perform-

ance skills, and style and concept approach to theatre. *Prerequisites: Theatre 12 required; 70A-B-C recommended; or consent of instructor.*

### 136. Freeing the Voice (4)

Intensive workshop for actors and directors designed to "free the voice," with special emphasis on characterization in a wide range of dramatic texts. This proven method combines experimental and didactic learning with selected exercises, texts, tapes, films, and total time commitment. *Prerequisites: Theatre 17, 30, and/or consent of instructor.*

### 137. Singing for the Actor (4)

This course is designed for advanced students who have met all requirements of the undergraduate acting sequence. Students will be introduced to concepts and practices of musical interpretation through selected exercises and pieces from the music repertoire. *Prerequisites: Theatre 17, 130A-B, 136, and/or consent of instructor.*

### 138A-B. Advanced Acting (4-4)

Further studies in the process of acting, theory, and practice, through concentrated work in classical texts. *Prerequisites: Theatre 130A-B and/or consent of instructor. Admission by audition only.*

### 139. Advanced Directing (4)

A studio course for advanced students, this study will focus on the development of the director's most complex task: the creation (with actors) of a physical realization of text. The course will use carefully selected scenes as model studies in which problems of composition, development of action, interaction of characters, motivational movement, and fusion of text and action are explored. Interview may be required for admission to the course. *Prerequisites: Theatre 70A-B-C, 105, 131 required, and consent of instructor.*

### 140. Topics in Dramatic Literature: \_\_\_\_\_ (4)

A lecture course offering the upper-division and/or graduate student an in-depth exposure to an important individual writer or subject in dramatic literature. May be repeated two times for credit. *Prerequisite: Theatre 42, 43, 44 required or consent of instructor.*

### 141. Modern Black Drama (4)

From Lorraine Hansberry's *Raisin in the Sun* to the latest plays of Ed Bullins, black drama has mirrored and, in some instances, forecast the mood and aspirations of black people in America. The course examines the plays, playwrights, and participants in contemporary black theatre, its concerns and influences. *Prerequisites: Theatre 42, 43, 44 strongly recommended.*

### 142. Chicano Dramatic Literature (4)

(Same as Chicano Studies 142.) Focusing on the contemporary evolution of Chicano dramatic literature, this course will analyze the playwrights and theatre groups that express the Chicano experience in the United States. Relevant "actos," plays, and documentaries will be examined for their contributions to the developing Chicano theatre movement. *Prerequisites: upper-division standing; Theatre 15, 42, 43, 44 strongly recommended, or consent of instructor.*

### 143. Masters of Theatre: \_\_\_\_\_ (4)

This seminar study will focus on an artist of seminal importance to the development of the theatre. Intensive consideration will be given to theory and practice of the artist under consideration, with emphasis on theatrical realizations that can be reconstructed by integrated research, including biography, major theoretical texts, production records, correspondence, and critical studies. The goal is a newly rounded understanding of a complex theatre artist. Topic will vary quarter to quarter. May be repeated two times for credit. *Prerequisites: upper-division standing, Theatre 42, 43, 44 required, or consent of instructor.*

### 144. Myth and Dream: Theatre of Fantasy (4)

A seminar exploration of plays and production styles that employ the art of the theatre to enter imaginative worlds beyond our conscious experience. *Prerequisites: upper-division standing, Theatre 42, 43, 44 required, or consent of instructor.*

### 145. Theatre and Society: Satire, Fact, and Propaganda (4)

An examination of theatrical forms that probe social structures and human behavior, economics and class relationships, and politics and power. Ranging from the Greek to the modern theatre, plays will be studied in the context of the society for which they were written, and will include examples

of social satire, social realism, documentary theatre, agit-prop drama, and didactic epic theatre. *Prerequisites: upper-division standing, Theatre 42, 43, 44 required, or consent of instructor.* (Not offered in 1987-88.)

### 146. The Theatre of Private Life: Family and Friends (4)

A close examination of theatre involving a concern for the nature of human interaction and personal interplay, as revealed by conflict within families or small groups. *Prerequisites: Theatre 42, 43, 44 required or consent of instructor.* (Not offered in 1987-88.)

### 147. Shakespeare on Stage (4)

A close look at the performance of Shakespeare's plays in the theatre from the point of view of actor and director. Exploration of historical elements that shaped the Bard's repertoire. Lectures and texts will be illustrated with scenes presented live and on film and will be critiqued. May be repeated one time for credit. *Prerequisite: Theatre 42, 43, 44 recommended.*

### 148. Theory of Theatre (4)

The basic objectives of the course are: (1) to survey the most important theories of theatre from Aristotle to present-day structuralism and to establish theoretical terminology; (2) to learn to analyze a theatre production; and (3) to learn to use theoretical material as a part of the creative process for actor, playwright, and director. *Prerequisites: upper-division standing, Theatre 42, 43, 44 required, or consent of instructor.*

### 149. Contemporary Theatre (4)

Seminar course dealing with the forms of contemporary theatre and principal figures in the contemporary theatre world — playwrights, directors, performers. Specific topic will vary from year to year. *Prerequisites: upper-division standing, Theatre 42, 43, 44 required, or consent of instructor.*

### 150. Topics in Dramaturgy (4)

Lecture/discussion course focusing on dramaturgical process and method in world theatre. Emphasis will be placed on developing an understanding of the dramaturg's function with regard to interpreting classic works of dramatic literature and to developing new plays for the contemporary theatre. May be repeated one time for credit. *Prerequisite: upper-division standing.*

### 151. Social Psychology and Dramatic Arts (4)

(Same as Psychology 149.) This undergraduate seminar will explore the relationship between social psychology and drama, focusing especially on the use of psychological principles in plays (by playwrights) and their performance (by directors, actors, and choreographers). In addition to discussions and student presentations based on assigned readings, there will be videotaping sessions of students' scenework. May be repeated one time for credit. *Prerequisite: Major or minor in psychology or theatre or consent of instructor.*

### 152. From Text to Performance (4)

Examination of representative dramatic literature from the text, through rehearsal, to the culminating performance. Lectures on the play and its background, the work of the actor, director, and designers. Attendance at rehearsals and a performance of the play. May be repeated two times for credit. *Prerequisite: upper-division standing.*

### 153A. Playwriting Workshop (4)

A project-oriented exploration of writing for the theatre, focusing on finding effective form for dramatic action, developing character, and writing dialogue. Students will have various writing exercises and will write one or more short plays. Classes will be largely symposium sessions where students will engage in shared evaluation of scripts generated by writers in the class. *Prerequisites: Theatre 42, 43, 44 recommended; must have consent of instructor.*

### 153B. Intermediate Playwriting Workshop (4)

For students with some experience and special interest in playwriting. Detailed attention will be given to character development and techniques for writing dialogue. Students will write a one-act play during the term which will be discussed at each step in its development in symposium sessions. *Prerequisite: Theatre 153A and/or consent of instructor.*

### 154. Advanced Undergraduate Playwriting (4)

For students who have a special interest in playwriting. Projects will be decided upon on an individual basis. The class will meet in seminar to discuss each step in the development of the plays being written. May be repeated one time for credit. *Prerequisites: Theatre 153A and 153B.*

**155A. Theatre Administration (4)**

A study of multiple aspects of theatre management, including audience development, public relations and arts publicity, budgeting and fiscal administration, personnel management in the arts, foundation grant development, facilities control and multiple arts usage, effective liaison with artistic staff, coordination with regional and national arts groups. Course will include field studies, guest lecturers from the professional theatre, and intern projects. *Prerequisite: Theatre 135 or consent of instructor.*

**155B. Advanced Theatre Administration (1-4)**

A study of multiple aspects of theatre management, including audience development, public relations and arts publicity, budgeting and fiscal administration, personnel management in the arts, foundation grant development, facilities control and multiple arts usage, effective liaison with artistic staff, coordination with regional and national arts groups. Course will include field studies, guest lecturers from the professional theatre, and intern projects. *Prerequisites: Theatre 155A and consent of instructor.*

**156. Production Management (4)**

Course follows the operation of a theatre production manager including long-range scheduling, technical/design management, skills, hiring and contracts procedures, budget allocations, accounting considerations, and critical analysis. *Prerequisite: upper-division standing.*

**157. Music Drama (4)**

(Same as Music 122.)

In-depth analysis of the music and lyrics of important figures from the history of music theatre. Topics will vary each quarter, but may include aspects of interpretation, production, direction and design, and will be integrated with musical analysis. *Prerequisite: upper-division standing.*

**158. Experimental Theatre Workshop (4)**

The Experimental Theatre Workshop is for those students who are interested in acting or in playwriting. The workshop will deal with some of the fundamental aspects of theatre: transformation, dialogue, character from a point of view common to both actors and playwrights. The acting student can see this workshop as a way of learning to understand the literary text through developing and performing his or her own text. The playwriting student can see the workshop as a way of learning to develop dramatic text through the acting process. Class will culminate in performances. *Prerequisite: consent of instructor.*

**159. Modern Drama on Film (4)**

Extensive examination of major plays from the modern American theatre that have been recorded on film or video. The class will study developing American mythos, and the shaping of American theatre art as a unique twentieth-century cultural phenomenon. Students will attend film screenings and participate in scene presentations from the plays studied to facilitate discussion of these plays as performance. There will be discussions of the films as interpretations of the plays and comparison of live theatre and films as means of communicating the central strategies of American drama. *Prerequisites: Theatre 42, 43, and 44 required, or consent of instructor.*

**160. The Classical Theatre (4)**

A study of ancient Greek and Roman theatre, with representative tragedies and comedies by Aeschylus, Sophocles, Euripides, Aristophanes, Plautus, Terence, and Seneca. Several films of classical plays will be discussed from the point of view of modern production problems. *Prerequisites: Theatre 42, 43, 44 and upper-division standing.*

**161. The Romantic Theatre (4)**

This conceptual study will examine both the influence of nineteenth-century romanticism on contemporary theatre and romanticism as one of the fundamental attitudes toward art and life present throughout history. Emphasis will be placed on the relationship between contemporary assumptions about theatre and their original formulations in the context of the romantic theatre, and on how the romantic premises and attitudes found their expression in elements of theatrical structure — acting, directing, design, dramatic text — and in the audience's experience and response. *Prerequisites: Theatre 42, 43, 44, and upper-division standing.*

**162. The Realistic Theatre (4)**

This conceptual study will examine both the influence of nineteenth-century realism on contemporary theatre and realism as one of the fundamental attitudes toward art and life present throughout history. Emphasis will be placed on

the relationship between contemporary assumptions about theatre and their original formulations in the context of the realistic theatre, and on how the ideas of realistic representation found their expression in elements of theatrical structure — acting, directing, design, dramatic text — and in the audience's experience and response. *Prerequisites: Theatre 42, 43, 44 and upper-division standing.*

**163. The History of Musical Theatre (4)**

A discussion of the historical development of the form known as "musical comedy" beginning with the works of Gilbert and Sullivan through contemporary examples of Bernstein and Sondheim. An analysis of words and music and the tracing of the "form" as specific genre of theatrical entertainment. Such composers and lyricists as Lehar, Kern, Berlin, Gershwin, Rodgers and Hammerstein, and Lerner and Lowe will be discussed and reviewed. *Prerequisites: upper-division standing, Theatre 42, 43, 44 required, or consent of instructor.*

**164. Topics in Theatre History: \_\_\_\_\_ (4)**

A lecture course dealing with a specific topic or period in theatre history. Course is designed to provide the upper-division and/or graduate student with an in-depth knowledge of an important period or artist in the history of theatre. Topics will vary from quarter to quarter. May be repeated two times for credit. *Prerequisites: Theatre 42, 43, 44 or consent of instructor.*

**165. Visual Ideas II (4)**

History of visual expression of Renaissance, baroque, rococo, French Revolution, realism, focusing on the visual arts of the theatre as they reflect and use significant artistic movements. An integrated study through reading, research, and lecture of the traditionally separate disciplines of fine and applied art, social and political history, and the theatre. *Prerequisite: upper-division standing. Theatre 160 and 161 recommended.*

**166. Visual Ideas III (4)**

History of visual expression from realism to the present, focusing on the visual arts of the theatre as they reflect and use significant artistic movements. An integrated study through reading, research, and lecture of the traditionally separate disciplines of fine and applied art, social and political history, and the theatre. *Prerequisite: upper-division standing. Theatre 160 and 161 recommended.*

**167A-B. History of Costume (4-4)**

A survey history tracing the evolution of clothing and its social context from preliterate cultures through the twentieth century. Offered in alternate years. *Prerequisites: Theatre 165, 166 recommended, 167A for 167B and consent of instructor.*

**168. History of Russian Theatre (4)**

A study of representative Russian plays and of the production theories and methods of such directors as Stanislavsky and Meyerhold. There will also be consideration of Russian opera and ballet, and of the contribution of Russian theatre to world theatre. *Prerequisites: Theatre 42, 43, 44.*

**169. History of Avant-Garde Theatre (4)**

The course will cover the tradition of the avant-garde theatre performances from the end of the nineteenth century to the Second World War. It will deal with the individual artists as well as movements which were the most representative and influential on the culture of the twentieth century. *Prerequisites: upper-division standing. Theatre 42, 43, 44 required or consent of instructor.*

**170. Beginning and Intermediate Design Studio (4)**

This course will focus on beginning and intermediate level problems in theatre design, including text analysis, research conceptualization, and visual expression. Students will work on individual projects in lighting and scenic design. The course will include group critiques of completed designs and works in progress. May be repeated five times for credit. *Prerequisites: Theatre 70A-B-C and consent of instructor.*

**171. Development of Design (4)**

Course focuses on specialized process of developing theatrical design. Taught by specialists in scene painting, wig making, tailoring for theatrical costuming, sound design, and other design areas, students explore through laboratory work the evolution of theatrical design. In-depth involvement in specialized aspects of theatrical design. Guest artists from the profession will be used to enhance instruction. May be repeated three times for credit. *Prerequisite: upper-division standing, 70A-B-C recommended.*

**172A. Lighting Design (4)**

Projects in lighting design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes manipulating light and color in a lab setting and drafting basic light plots and sections. *Prerequisite: Theatre 70A or consent of instructor. Theatre 165, 166 recommended.*

**172B. Advanced Lighting Production (4)**

Methods of stage lighting for drama, opera, and dance. Advanced work in designing lights for different staging configuration, e.g., proscenium, thrust. *Prerequisite: Theatre 70A, or consent of instructor.*

**173A. Scene Design (4)**

Projects in scene design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes drafting, model building, and rendering in various media for specific plays. *Prerequisites: Theatre 70B and consent of instructor. Theatre 165, 166 recommended.*

**173B. Advanced Scenic Production (4)**

Advanced studies in technical production of scenery and properties for the theatre. Lectures and individual projects focus on problems in planning, drafting, construction, painting, and technical direction for a variety of performing spaces. *Prerequisites: Theatre 70B, 173A, and consent of instructor.*

**174. Drafting for the Theatre (4)**

Studies in technical drawing for the theatre designer and technician. Through instruction and laboratory exercises, the student designer should attain a basic understanding of technical drawing and graphic skills so that he or she will be able to communicate design ideas to scenic and lighting workshops. *Prerequisites: Theatre 70A-B or consent of instructor.*

**175. Drawing for the Theatre (4)**

Studies in representational drawing for the theatre designer. May be repeated one time for credit.

**176A. Costume Design (4)**

Projects in costume design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes costume rendering in various media for specific plays. *Prerequisites: Theatre 70C and consent of instructor. Theatre 164, 165, and 166 recommended. Theatre 176A is a prerequisite to Theatre 176B.*

**176B-C. Elements of Costume (4-4)**

First quarter of course consists of demonstrations and projects related to theatrical millinery, fabric terminology, mask and armor construction, and fabric painting/dyeing techniques. Second quarter consists of demonstrations and projects related to pattern drafting and construction of costumes for the stage, utilizing designer's rendering. *Prerequisite: Theatre 70C.*

**177. Fabric Painting and Dyeing for the Theatre (4)**

Studies in the surface treatment of fabric for theatre costume. Includes textile design techniques of batik, silkscreen, blockprint, aging and distressing of costumes in addition to discussion of dye theory and pigment application. Class will include lecture, demonstration, and individual studio projects. *Prerequisite: Theatre 176B or consent of instructor.*

**178. Special Topics in Theatre Design (4)**

A course designed to expose the theatre design student to a variety of specialized topics, including millinery, pattern drafting and draping, scenic painting, model making, rendering. Topics will vary from quarter to quarter. May be repeated three times for credit. *Prerequisites: Theatre 70A-B-C and consent of instructor.*

**179. Theatrical Makeup (4)**

This class is intended to be a workshop in the study of theatrical makeup and its application. Studies in age makeup, character makeup, animal makeup, prosthetic and hair piece application and construction, etc. Should serve to acquaint the theatre student with the basics needed to create the visual elements of an acting role. *Prerequisite: Theatre 19 or consent of instructor.*

**180. Major Project in Acting (2 or 4)**

Designed for the advanced performance student, this course will allow for intensive focus upon a particular challenging role, and for its development within the context of preparation, rehearsal, and performance. Additionally, the interaction of students within this course will allow for a sharpened understanding of the external adjuncts to the role, and of the

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other creative forces that must be assimilated. May be repeated one time for credit. *Prerequisites: Theatre 130A-B and consent of instructor.*

### 181. Major Project in Design/Theatre Production (2 or 4)

Designed for the advanced design/production student, this course will allow for concentration on a particularly challenging design or theatre production assignment, including such areas as assistant designer (scenery, lighting, or costumes), technical director, master cutter, or master electrician. Additionally, the interaction of students within this course will allow for a sharpened understanding of the external adjuncts to the project, and of the other creative forces that must be assimilated. May be repeated one time for credit.

### 182. Major Project in Theatre Management (2 or 4)

Designed for the advanced student in theatre management, this course will allow for concentration on a demanding assignment in theatre management and administration, including such areas of responsibility as stage management, advertising and promotion, tour management, and financial administration. Additionally, the interaction of students within this course will allow for a sharpened understanding of the external adjuncts to the role, and of the other creative forces that must be assimilated. May be repeated one time for credit. *Prerequisites: Theatre 135 and consent of instructor.*

### 183. Major Project in Directing (2 or 4)

Designed for the advanced student in directing, this course will permit intensive concentration on the full realization of a dramatic text, from research and analysis through rehearsal and into performance. Additionally, the interaction of students within this course will allow for a sharpened understanding of the external adjuncts to the role, and of the other creative forces that must be assimilated. May be repeated one time for credit. *Prerequisites: Theatre 131 and 139 and consent of instructor.*

### 186. Feminist Theatre (6)

(Same as Com/Cul 116.)

This course explores the relationship between dramatic production and theory in a feminist context. Texts as well as methods will be based on examination of such questions as nature of collaboration, gender as an aspect of role identity, and sexual codes of behavior. This class will create, as an ensemble, both a live production and a distinct video production of a feminist drama. Comparative analysis of video and theatre as potentially feminist media will be included. *Prerequisites: Com/Cul 100 and Com/Gen 100, or Theatre 12 or 30 recommended.*

### 187A. Ensemble: \_\_\_\_\_ (4)

An intensive theatre practicum designed to generate theatre created by an ensemble with particular emphasis upon the analysis of text. Students will explore and analyze the script and its author. Ensemble segments include: black theatre, Chicano theatre, feminist theatre, commedia dell'arte theatre. Audition may be required. A maximum of twelve units may be used toward graduation.

### 187B. Ensemble: \_\_\_\_\_ (4)

An intensive theatre practicum designed to generate theatre created by an ensemble, with particular emphasis upon explorations of ensemble rehearsal process, the development of technical self-support systems, the extension of performance modes, and the performer/event/audience relationships. Ensemble segments include: black theatre, Chicano theatre, feminist theatre, commedia dell'arte theatre. Audition may be required. *Prerequisite: Theatre 187A. A maximum of twelve units may be used toward graduation.*

### 188. Touring Theatre (0-8)

Intensive studio ensemble course designed to provide the student the full range of learning experiences which evolve from the complex necessities of touring theatre to a wide variety of locales and a broad range of performance spaces. May be repeated one time for credit. *Prerequisite: consent of instructor.*

### 189. Major Seminar (1)

Required of all theatre majors. Designed to provide the student with an opportunity to explore a variety of topics relating to the dramatic arts to be presented by Department of Theatre faculty and distinguished lecturers.

### 191. Themes of Aging in Dramatic Literature and Society (4)

An examination of selected dramatic literature in terms of age-related stereotypes, prejudices, fears, anxieties, and de-

nials. An examination of culturally based views on aging. Text analysis will range from Sophocles to Albee and Beckett. May be repeated one time for credit if different literature is covered.

### 195. Instructional Assistance (2 or 4)

Assist with instruction in undergraduate Department of Theatre courses. May be repeated for a total of eight units.

### 196. Senior Study in Theatre (2-8)

Designed for the senior theatre major who has shown exceptional ability, and for whom a special study of major scope and depth will provide a significant culminating experience. These studies will vary in subject according to student needs and interests, but will only be permitted for those whose proven creative gifts and level of preparation qualify them for work and achievement at the highest level. *Prerequisites: senior standing and consent of instructor.*

### 197. Field Studies (2-8)

Designed for advanced students, this course will enable them to significantly extend their knowledge of the theatre through intensive participation in the creative work of major professional theatre, under the guidance of artists resident in those theatres. In addition, students will be required to submit a regular written evaluation each week of their ongoing field study to their faculty adviser. *Prerequisites: consent of instructor and senior standing.*

### 198. Directed Group Studies in Theatre (0-2-4)

Group studies, readings, projects, and discussions in theatre history, problems of production and performance, and similarly appropriate topics. *Prerequisites: minimum, junior standing and consent of instructor.*

### 199. Special Projects in Theatre (0-2-4)

Qualified students will pursue special projects in reading drama, studying theatre history, or doing research for a production. *Prerequisites: minimum, junior standing and consent of instructor.*

## Graduate

NOTE: The theatre graduate program is currently under review, and substantial changes may result. Students should consult with the departmental graduate adviser to determine the exact details of the program and the course offerings at the time.

### 200. Dynamics (1)

A daily program of physical, vocal, and speech exercises designed to prepare the student to move in a focused way into specific class areas with minimum amount of warm-up time. The exercises work on development of flexibility, strength, and coordination throughout the body. Strong emphasis is placed on physical and mental centering within a structured and disciplined approach to preparation.

### 201. Stage Combat (2)

A study of the dramatic elements of stage violence, and practical work in developing the physical skills necessary to fully realize violent moments on the stage. At the core of the study is the process from text to convincing theatrical action. Physical work revolves around basic principles of energy, focus, and center inherent in unarmed and weapons combat.

### 202. From Script to Performance (3)

A study of selected scripts and of productions of those scripts recorded on film or videotape. Through discussion, we will analyze the acting styles and techniques and interpretations of the scripts in the recorded productions. *Prerequisite: graduate standing.*

### 203. Text Analysis for the Actor (2)

A course designed to introduce the actor to the principles of text analysis, character analysis, and scoring, using the theories of transactional analysis as the principle tool. Lectures and discussions on the principles of Constantin Stanislavsky and Eric Berne, and presentation of sample text analysis by members of the class form the structure of the course. *Prerequisite: graduate standing.*

### 204. Problems of Textual Analysis (4)

The class will study a number of plays representative of important dramatic genres. We will first research existing criti-

cal material about each individual play concentrating on philosophical, formal, structural, and psychological interpretations. Subsequently we will analyze each play as if it were considered for production in a contemporary repertory theatre. *Prerequisite: graduate standing.*

### 205. Improvisation for the Theatre (3)

A course designed to introduce improvisational techniques to professional acting students. A variety of approaches to the art of improvisation will be presented and practiced, both serious and comic. Small and large group improvisations will be offered for participation.

### 210A-B-C. Acting Process I: Realism (3-3-3)

The actor's process is analyzed and experienced through a series of exercises designed to introduce the actor to the principles of "action" and "objective" followed by scene work from realistic texts employing an "actor's score" as a viable tool, culminating in intensive work on Chekhov. *Prerequisites: 210A for B; 210B for C.*

### 211A-B-C. Speech for the Actor I (1-1-1)

Introduction of the principles of phonetics and articulation. Constant study and drill to prepare the actor for standard speech and flexibility. *Prerequisite: graduate standing.*

### 212A-B-C. Theatre Production I (1-4/1-4/1-4)

Ranging from staged readings of new plays, documentary drama, or synthetically created dramatic texts to totally integrated productions of full-length plays (faculty or student directed) and incorporating the creative contribution of actors, directors, playwrights, and critics, this intensive involvement in multiple forms of theatre will serve as the necessary creative laboratory for the M.F.A. program. (S/U grades only.) *Prerequisites: 212A for B; 212B for C.*

### 213A-B-C. Movement for Theatre I (2-2-2)

An intensive studio course in the art of movement as a basis for theatre performance. Theory and practice of energy flow, weight, spatial focus, time consumption, and the shape factor. (S/U grades only.) *Prerequisites: 213A for B, 213B for C.*

### 214A-B-C. Voice for Theatre I (2-2-2)

Voice exercises designed to "free the voice" with emphasis on diaphragmatic breathing, articulation exercises, and singing exercises. Course designed to broaden pitch, range, projection, and to expand the full range of potential characterizations. (S/U grades only.) *Prerequisites: 214A for B; 214B for C.*

### 215. Stage Makeup (1)

Course moves from fundamentals of makeup for the theatre (historical styles, development of makeup media) to special effects derived from various materials, facial structure and basic makeup design, color and light in makeup, basic application theory and technique. *Prerequisite: graduate standing.*

### 216. Singing for the Actor I (1)

Vocal technique for the musical theatre. Exercises, scales, sight reading, ensemble work, preparation of individual pieces. *Prerequisite: graduate standing.*

### 217. New Plays Workshop (1-4)

A weekly workshop with actors, directors, writers, and dramaturgs. Course will focus on the development of stage readings of new works by the playwrighting students. *Prerequisite: graduate standing.*

### 218. Directing for Non-Directors (1-4)

A process class for M.F.A. students in areas other than directing, focusing on the director's preparation and presentation of scenes from various periods of dramatic literature. *Prerequisite: graduate standing.*

### 219. Directing Process Studio (2/4)

Preparation, presentation, and discussion of representative scenes from various periods of dramatic literature. *Prerequisite: graduate standing.*

### 220A-B. Acting Process II: Classical Text (3-3)

An intensive studio examination of problems and potentials associated with the theatrical realization of the classical text.

### 221A-B. Speech for the Actor II (2-2)

Advanced work in phonetics and articulation. Intensive study of stage dialects to prepare actor for variety of roles. *Prerequisite: graduate standing.*

### 222A-B-C. Theatre Production II (1-4/1-4/1-4)

Ranging from staged readings of new plays, documentary drama or synthetically created dramatic texts to totally inte-



graded productions of full-length plays (faculty or student directed) and incorporating the creative contribution of actors, directors, playwrights, and critics, this intensive involvement in multiple forms of theatre will serve as the necessary creative laboratory for the M.F.A. program. (S/U grades only.) *Prerequisite:* 222A for B.

#### 223A-B. Movement for Theatre II (2-2)

An advanced course in the art of movement for the theatre, building on the knowledge gained in Theatre 213. (S/U grades only.) *Prerequisite:* 223A for B.

#### 224A-B. Voice for Theatre II (2-2)

Advanced voice training designed to help the actor fuse voice, emotion, and body into a fully realized reflection of the text. (S/U grades only.) *Prerequisite:* 224A for B.

#### 225A-B. Singing for the Actor II (1)

Continuing vocal technique for the musical theatre. More complicated musical material investigated and prepared. *Prerequisite:* graduate standing.

#### 229. Theatre Externship (9-12)

Selected professional opportunities in repertory and commercial theatre, designed to engage the student in particular creative responsibilities under the guidance of master artist-teachers.

#### 230. Acting Process III: Actors' Studio (3)

An advanced studio for graduate actors and directors, this work will explore a single text from the modern theatre under the direction of a master teacher-artist. Concentration will be on multiple possible modes of encountering a text, varieties of interpretation and performance realization, and the development of a theatre ensemble.

#### 231. Survival Seminar (1-3)

An advanced seminar that focuses on the grimmer realities that bridge between the theatre artist and the theatre, including a study of unions, relations with agents and managers, contracts and taxation, auditioning, interviewing, and various methods of professional development. Particular attention will be given to generation of a broad understanding of the company to enter into participation in the professional theatre.

#### 232A-B. Theatre Production III (1-4/1-4)

Ranging from staged readings of new plays, documentary drama, or synthetically created dramatic texts to totally integrated productions of full-length plays (faculty or student directed) and incorporating the creative contribution of actors, directors, playwrights, and critics, this intensive involvement in multiple forms of theatre will serve as the necessary creative laboratory for the M.F.A. program. *Prerequisite:* Theatre 232A for 232B.

#### 233. Acting for the Camera (1)

This course is designed to aid the actor in the transition from stage to film work. Examination of film production and its physical characteristics and the acting style needed for work in film and television. Students will rehearse and perform in simulated studio setting.

#### 234. Voice for Theatre III (1-2)

A one-quarter course devoted exclusively to intensive development of the actor's vocal capability to master a variety of musical theatre scores. Concentration on extending the vocal range, sight reading, textual and musical analysis, and musical characterization.

#### 236. Actor's Recital (1-3)

A course designed to allow for the careful and thorough selection, rehearsal, and performance of an actor's recital, composed of material ranging from the classical to the contemporary theatre, and determined by the particular artistic interests and capabilities of the performer.

#### 238. Speech for the Actor III (1)

Continuing advanced work in phonetics and articulation. Intensive study of stage dialects to prepare actor for variety of roles.

#### 239. Movement for Theatre III (1)

An advanced course in the art of movement for the theatre, building on the knowledge gained in Theatre 223A and B.

#### 240. Graduate Directing Seminar (0-4)

A seminar for all graduate directing students. Devoted to exploring the historical, theoretical, practical, and personal aspects of the craft and process of directing. Includes discussion, readings, occasional papers, and directing exercises. Will relate strongly to each term's directing projects.

#### 241. Modern Black Drama (4)

From Lorraine Hansberry's *Raisin in the Sun* to the latest plays of Ed Bullins, black drama has mirrored and, in some instances, forecast the mood and aspirations of black people in America. The course examines the plays, playwrights and participants in contemporary black theatre, its concerns and influences. *Prerequisite:* graduate standing.

#### 242. Chicano Dramatic Literature (4)

Focusing on the contemporary evolution of Chicano dramatic literature, this course will analyze the playwrights and theatre groups that express the Chicano experience in the United States. Relevant "actos," plays, and documentaries will be examined for their contributions to the development of the Chicano teatro movement. *Prerequisite:* graduate standing.

#### 243. Masters of Theatre: \_\_\_\_\_ (4)

This seminar study will focus on an artist of seminal importance to the development of the theatre. Intensive consideration will be given to theory and practice of the artist under consideration, with emphasis on theatrical realizations that can be reconstructed by integrated research, including biography, major theoretical texts, production records, correspondence, and critical studies. The goal is a newly rounded understanding of a complex theatre artist. Topic will vary quarter to quarter. *Prerequisite:* graduate standing.

#### 244. Myth and Drama: Theatre of Fantasy (4)

A seminar exploration of plays and production styles that employ the art of the theatre to enter imaginative worlds beyond our conscious experience. *Prerequisite:* graduate standing.

#### 245. Theatre and Society: Satire, Fact and Propaganda (4)

An examination of theatrical forms that probe social structures and human behavior, economics and class relationships, and politics and power. Ranging from the Greek to the modern theatre, plays will be studied in the context of the society for which they were written, and will include examples of social satire, social realism, documentary theatre, agit-prop drama, and didactic epic theatre. *Prerequisite:* graduate standing.

#### 246. The Theatre of Private Life: Family and Friends (4)

A close examination of theatre involving a concern for the nature of human interaction and personal interplay, as revealed by conflict within families or small groups. *Prerequisite:* graduate standing.

#### 247. Topics in Dramatic Literature (4)

A lecture course offering the upper-division and/or graduate student an in-depth exposure to an important individual writer or subject in dramatic literature. Topics will vary from quarter to quarter. *Prerequisite:* graduate standing.

#### 248. Theory of Theatre (4)

The basic objectives of the course are (1) to survey the most important theories of theatre from Aristotle to present day structuralism and to establish theoretical terminology; (2) to learn to analyze a theatre production; and (3) to learn to use theoretical material as a part of the creative process for actor, playwright, and director. *Prerequisite:* graduate standing.

#### 249. Contemporary Theatre (4)

Seminar course dealing with the forms of contemporary theatre and principal figures in the contemporary theatre world — playwrights, directors, performers. Specific topics will vary from year to year. *Prerequisite:* graduate standing.

#### 250. Playwriting Seminar (4)

The specific topic will vary each quarter but may include (1) an investigation of the realistic dramatic genre and a review of fundamentals of playwriting; (2) an investigation of the variety of nonrealistic dramatic genres and a further study of more complex issues of dramatic composition. *Prerequisite:* graduate standing.

#### 251. Playwriting Practicum (3-6)

Creative writing project developing original scripts from outline to the final play. Plays may vary depending on the quarter, but will include writing of a realistic one-act, a nonrealistic one-act, a one-act documentary or dramatization of fiction, a full-length play. *Prerequisite:* graduate standing.

#### 252. Dramaturgy Seminar (3)

Class will deal with series of tasks usually associated with the function of dramaturg in professional repertory company: preparation of text for production; cutting and rewriting of plays; problems of translation, etc. Class will also deal with the general issue of the function of dramaturg in the contemporary American theatre. *Prerequisite:* graduate standing.

#### 253. Dramaturgy Practicum (3)

Students enrolled in this course will work on productions in the function of a dramaturg. This will entail preparation of texts, research, participation at rehearsals, etc. *Prerequisite:* graduate standing.

#### 254. Topics in Dramaturgy (4)

Lecture/discussion course focusing on dramaturgical process and method in world theatre. Emphasis will be placed on developing an understanding of the dramaturg's function with regard to interpreting classic works of dramatic literature and to developing new plays for the contemporary theatre.

#### 256. Contemporary Plays (2)

A guided reading course focusing exclusively on very recent plays in an attempt to become aware of what is being written now. Plays chosen will be primarily American. Course may be repeated for credit.

#### 257. Music Drama (4)

In-depth analysis of the music and lyrics of important figures from the history of music theatre. Topics will vary each quarter, but may include aspects of interpretation, production, direction and design, and will be integrated with musical analysis. *Prerequisite:* graduate standing.

#### 260. The Classical Theatre (4)

A study of ancient Greek and Roman theatre, with representative tragedies and comedies by Aeschylus, Sophocles, Euripides, Aristophanes, Plautus, Terence, and Seneca. Several films of classical plays will be discussed from the point of view of modern production problems.

#### 261. The Romantic Theatre (4)

This conceptual study will examine both the influence of nineteenth-century romanticism on contemporary theatre and romanticism as one of the fundamental attitudes toward art and life present throughout history. Emphasis will be placed on the relationship between contemporary assumptions about theatre and their original formulations in the context of the romantic theatre, and on how the romantic premises and attitudes found their expression in elements of theatrical structure — acting, directing, design, dramatic text — and in the audience's experience and response. *Prerequisite:* graduate standing.

#### 262. The Realistic Theater (4)

This conceptual study will examine both the influence of nineteenth-century realism on contemporary theatre and realism as one of the fundamental attitudes toward art and life present throughout history. Emphasis will be placed on the relationship between contemporary assumptions about theatre and their original formulations in the context of the realistic theatre, and on how the ideas of realistic representations found their expression in elements of theatrical structure — acting, directing, design, dramatic text — and in the audience's experience and response. *Prerequisite:* graduate standing.

#### 264. Topics in Theatre History (4)

A lecture course dealing with a specific topic or period in theatre history. Course is designed to provide the upper-division and/or graduate student with an in-depth knowledge of an important period or artist in the history of theatre. Topics will vary from quarter to quarter. *Prerequisite:* graduate standing.

#### 265. Visual Ideas II (4)

History of visual expressions of Renaissance, baroque, rococo, Revolution, realism focusing on the visual arts of the theatre as they reflect and use significant artistic movements. An integrated study through reading, research, and lecture of the traditionally separate disciplines of fine and applied art, social and political history, and the theatre. *Prerequisite:* graduate standing.

#### 266. Visual Ideas III (4)

History of visual expression of realism to the present, focusing on the visual arts of the theatre as they reflect and use significant artistic movements. An integrated study through reading, research, and lecture of the traditionally separate disciplines of fine and applied art, social and political history, and the theatre. *Prerequisite:* graduate standing.

#### 268. History of Russian Theatre (4)

A study of representative Russian plays and of the production theories and methods of such directors as Stanislavsky and Meyerhold. There will also be consideration of Russian opera and ballet, and of the contributions of Russian theatre to world theatre. *Prerequisite:* graduate standing.

## THIRD COLLEGE WRITING PROGRAM

### 270. Beginning and Intermediate Design Studio (4)

This course will focus on beginning and intermediate level problems in theatre design, including text analysis, research, conceptualization, and visual expression. Students will work on individual projects in lighting and scenic design. The course will include group critiques of completed designs and works in progress.

### 271. Advanced Design Studio III (1-6)

Ongoing work on individual projects for all graduate students in design with group critiques of completed designs and works in-progress. To be repeated each quarter of the graduate student's third-year residence.

### 272. Theatre Seminar (2)

An introduction to ideas and individuals in contemporary theatre for all first-quarter graduate students. *Prerequisite: graduate standing.*

### 273. Theatre Production: Design (1-4)

Intensive involvement in UCSD theatre productions in the role of designer or design assistant, including collaboration with director from dramatic text to production. The course will serve as the creative laboratory for M.F.A. students specializing in theatre design. *Prerequisite: graduate standing.*

### 274. Drafting for the Theatre (4)

Studies in technical drawing for the theatre designer and technician. Through instruction and laboratory exercises, the student designer should attain a basic understanding of technical drawing and graphic skills so that he or she will be able to communicate design ideas to scenic and lighting workshops. *Prerequisite: graduate standing.*

### 275. Drawing for the Theatre (4)

Studies in representational drawing for the theatre designer. Specific topic varies year to year.

### 276A. Costume Design (4)

Projects in costume design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes costume rendering in various media for specific plays.

### 276B-C. Elements of Costume (4-4)

First quarter will consist of demonstrations and projects related to theatrical millinery, fabric terminology, mask and armor construction, and fabric painting/dyeing techniques. Second quarter will consist of demonstrations and projects related to the pattern drafting and construction of costume for the stage, utilizing designer's rendering.

### 277. Fabric Painting and Dyeing for the Theatre (4)

Studies in the surface treatment of fabric for theatre costume, includes textile design techniques of batik, silkscreen, blockprint, aging and distressing of costumes in addition to discussion of dye theory and pigment application. Class will include lecture, demonstration, and individual studio projects. *Prerequisite: graduate standing.*

### 278. Special Topics in Theatre Design: \_\_\_\_\_ (4)

A course designed to expose the theatre design student to a variety of specialized topics, including millinery, pattern drafting and draping, scenic painting, model making, rendering. Topics will vary from quarter to quarter. *Prerequisite: graduate standing.*

### 279A-B-C. Lighting Design (4-4-4)

Course focuses on a progressive sequence of lighting design problems and situations; project work is combined with students' design work on UCSD productions, which is monitored and critiqued in class. *Prerequisite: graduate standing.*

### 280. Stage Management (1-4)

Discussion and research into the duties, responsibilities, and roles of a stage manager. Work to include studies in script analysis, communication, rehearsal procedures, performance skills, and style and concept approach to theatre. *Prerequisite: graduate standing.*

### 281. Theatre Administration Seminar (1-4)

A seminar for all graduate theatre administration students. Devoted to exploring the historical theoretical, practical, and personal aspects of the craft and process of theatre administration exercises. Will relate strongly to each term's theatre administration projects. *Prerequisite: graduate standing.*

### 282. Technical Production for Theatre Administrators (1-4)

A course for all theatre administration students aimed at developing knowledge and skill in the function and process of scenery, costume, and lighting workshops. Weekly projects will acquaint students with specific aspects of various workshops. *Prerequisite: graduate standing.*

### 283. Design Workshop: Costume, Lighting, Scenery (1-4)

For all first-year M.F.A. students in theatre administration. Course will vary from year to year, always focusing on the development of knowledge and awareness of design in the production process. Each term, the student will study one aspect of design, e.g., scenery, through class work or production projects. *Prerequisite: graduate standing.*

### 284. Theatre Administration (1-4)

A study of multiple aspects of theatre management, including audience development, public relations and arts publicity, budgeting and fiscal administration, personnel management in the arts, foundation grant development, facilities control and multiple arts usage, effective liaison with artistic staff, coordination with regional and national arts groups. Course will include field studies, guest lecturers from the professional theatre, and intern projects. *Prerequisite: graduate standing.*

### 285. Advanced Stage Management (1-4)

For all second-year theatre administration students. Course will focus on advanced problems in stage management, such as Actors Equity policy and practice in American theatres. *Prerequisite: graduate standing.*

### 286. Special Topics in Theatre Administration (1-4)

A course for second-year M.F.A. students in theatre administration. Topics will vary from quarter to quarter, focusing on various aspects of theatre administration and stage management. *Prerequisite: graduate standing.*

### 287. Production Management (4)

Course follows the operation of a theatre production manager, including long-range scheduling, technical design management skills, hiring and contracts procedures, budget allocations, accounting considerations, and critical analysis.

### 296. Theatre Administration Practicum (9-12)

Taken in the final term by second-year theatre administration students. Course focusing on the development of knowledge and skills of contemporary examples of theatre administration. *Prerequisite: graduate standing.*

### 297. Thesis Research (2-8)

Thesis research for M.F.A. degree. (S/U grades only.)

### 298. Special Projects (0-4)

Advanced seminar and research projects in theatre. (S/U grades only.)

### 299. Thesis Project (2-8)

Specific projects in theatre individually determined to meet the developing needs, interests, and abilities of M.F.A. candidates. (S/U grades only.)

### 500. Apprentice Teaching (2)

This course, designed to meet the needs of the graduate students who serve as teaching assistants, includes analysis of texts and materials, discussion of teaching techniques, conducting discussion sections, formulation of topics and questions for papers and examinations, and grading papers and examinations under the supervision of the instructor assigned to the course. Participation in the undergraduate teaching program is required for M.F.A. degree. The amount of teaching required is equivalent to the duties expected of a 25 percent teaching assistant for one quarter. Enrollment for two units in this course documents the requirement.

### 501. Teaching in the Humanities (4)

Consideration of pedagogical applications to teaching of literary, historical, and philosophical texts at the undergraduate level. Pedagogical aids for the teaching of composition and supervised teaching in sections of the undergraduate humanities sequence. *Prerequisite: graduate standing.*

## THIRD COLLEGE WRITING PROGRAM

OFFICE: Third College Humanities Building (TCHB), Third College

Charles R. Cooper, Ph.D., *Professor of Literature (Coordinator of the Program)*

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The Third College Writing Program (TCWP) offers Third College students a university course in writing and reading the major forms of nonfiction prose: autobiography, reportage, explanation, and argument. TCWP 1A and 1B are required of all Third College freshmen as part of the Third College general-education program. Some transfer students also take one or both courses. In TCWP, students practice a wide range of strategies for invention and inquiry, field research, and library research. They learn how to search out evidence supporting their arguments, to integrate it appropriately into their essay, and to document their sources. They receive comprehensive instruction in writing academic reports and taking essay exams. TCWP emphasizes the connection between reading and writing. Consequently, students engage in rhetorical analysis of published texts, learning critical reading skills which they apply in writers' workshops to their own and other students' texts. Students write about 15,000 words (journals, invention, drafts, revisions) and read about 1,000 pages in each course. Classes are small, permitting students to participate in discussion and analysis of readings and in writers' workshops, where drafts to be revised are analyzed critically by the instructor and other students. All essays are revised at least once. At least three times each quarter, students meet their instructors in scheduled tutorials. Both courses must be taken for a letter grade.

## Courses

### 1A-1B. The Writing Course (4-4)

A course in university reading and writing required of all Third College freshmen and of transfer students who have not completed a comparable course elsewhere. Course 1A focuses on explanation and argument (proposing solutions to problems, justifying evaluations, explaining causes, analyzing literature). Students study strategies of defining, illustrating, comparing, and classifying. They learn library search strategies as well as a style of documenting sources. Course 1B continues the study of argument and also concerns autobiography, biography, and reportage. Students study strategies of describing and narrating. Along the way to writing a long profile in the reportage sequence, students complete observational and interview writeups.



## THIRD WORLD STUDIES

OFFICE: Room 121, Third College  
Humanities Building, Third College

### Professors:

Carlos Blanco-Aguinaga, Ph.D. (*Spanish and Latin American Literature*)

Jaime Concha, Ph.D. (*Spanish and Latin American Literature*)

Sherley Anne Williams, M.A. (*American and Afro-American Literature*)

Edward Reynolds, Ph.D. (*African History, Coordinator of Third World Studies*)

### Associate Professors:

Richard J. Arneson, Ph.D. (*Philosophy*)

Thomas Dublin, Ph.D. (*History*)

Marta E. Sanchez, Ph.D. (*Latin American and Chicano Literature*)

Rosaura Sanchez, Ph.D. (*Spanish and Latin American Literature, Linguistics*)

William Tay, Ph.D. (*Chinese Literature*)

Carlos Waisman, Ph.D. (*Sociology*)

### Assistant Professor:

Robert Cancel, Ph.D. (*African and Caribbean Literature*)

Aralia Lopez-Gonzalez, Ph.D. (*Mexican and Caribbean Literature*)

George Mariscal, Ph.D. (*Spanish Literature*)

### Adjunct Professor:

Leften S. Stavrianos, Ph.D. (*History*)

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The Third World Studies Program has three main objectives:

1. To provide an understanding of the Third World and its relationships to the West. In order to understand these relationships, it is necessary to study the historical context out of which the present relationships developed. For example, besides trying to understand what kind of society existed in Meso-America when the Spaniards arrived in 1520, the student must also have an understanding of the historical development in Europe which resulted in Spain's decision to seek wider trade abroad. There is insistence on both the similarities and differences which Third World societies have among themselves and the similarities and differences with Western societies.
2. To provide an interdisciplinary approach to the study of the Third World. The program is not conceived as being exclusively historically oriented nor as being predominantly a social science program, but rather one that integrates both the social sciences and the humanities.

3. To provide an understanding of the relationship between Third World groups within the United States (Asian-American, black, Chicano, and Native American) and Third World societies (African, Asian, and Latin American) through a comparative approach. Third World societies are compared as they existed before contact with the West, in the various colonial relationships with the West, and in their evolution after independence.

## The Major Program

### Major

Students interested in Third World Studies may choose either an interdisciplinary major with a disciplinary focus (anthropology, economics, history, literature, political science, sociology, etc.) or a specific departmental major within the humanities or social sciences.

A Third World Studies major requires a minimum of *twelve* upper-division courses plus *three* lower-division courses from one of the Third World Studies sequences (TWS 7A-B-C, TWS 21, 22, 23, or TWS 24, 25, 26). Selection of a specific concentration, discipline, or department should be determined in consultation with a Third World Studies faculty member or program adviser.

### Double Major

Students interested in Third World Studies as a double major must have *eight* upper-division courses beyond their departmental major requirements. These eight may cover one or more disciplines. Courses may focus on a theme or problem or on a geo-historical area. The remaining four courses may overlap with the other major requirements. Students should consult a Third World Studies faculty member or program adviser for approval of a major program.

### Minor

A student may minor in Third World Studies by selecting a lower-division Third World Studies sequence (three courses) and three upper-division courses in disciplines dealing with the Third World.

Third World Studies faculty members offer courses in the Departments of Literature, Sociology, History, Philosophy, Theatre, and in the Third World

Studies Program. Appropriate courses in political science, music, and anthropology will also be considered. Students should consult departmental and program listings for Third World area offerings.

## Courses

See listings also under the Departments of Literature, History, Philosophy, and Sociology for other Third World area offerings.

### Lower Division

#### 7A. Race and Ethnicity in the United States (4)

(Same as History 7A.) A lecture-discussion course in the comparative ethnic history of the United States. Of central concern will be slavery, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America.

#### 7AW. Race and Ethnicity in the United States (6)

(Same as History 7AW.) A writing-intensive version of Third World Studies 7A that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States.

#### 7B. Race and Ethnicity in the United States (4)

(Same as History 7B.) A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be the Asian-American and white ethnic groups, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America.

#### 7BW. Race and Ethnicity in the United States (6)

(Same as History 7BW.) A writing-intensive version of Third World Studies 7B that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. The focus will be on Asian and European migration to the United States.

#### 7C. Race and Ethnicity in the United States (4)

(Same as History 7C.) A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be Chicanos, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in America.

#### 7CW. Race and Ethnicity in the United States (6)

(Same as History 7CW.) A writing-intensive version of Third World Studies 7C that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. Of central concern will be Chicanos, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America.

#### 14. Politics and the Third World Poor (4)

(Same as Political Science 14.) This course explores the context, structure, purpose, and fate of collective political action by the urban and rural poor in Latin America, Asia, and Africa. It examines local as well as national political organizations and their economic, social, and cultural foundations.

#### 15. Minorities and Politics (4)

(Same as Political Science 15.) This course analyzes the political and economic problems facing minority groups in the United States, in particular blacks, Hispanics, and women. Topics to be explored include the changing relationship between race, ethnicity, gender and class; the dilemmas of minority group political organization, leadership and interest, representation, the role of the state in defining minority status and in shaping the political behavior of minorities; and the applicability for today's minorities of the political strategies used by European immigrant groups such as the Irish, Italians, and Jews. (Course approval is pending.)

## THIRD WORLD STUDIES

### 21-22-23. Third World Literatures (4-4-4)

An introduction to the cultures of various Third World countries through close reading of selected literary texts. TWS 21 focuses on African literature. TWS 22 deals with Latin American literature and TWS 23 examines Chinese literature. Topics will vary each quarter. (F,W,S)

### 21W, 22W, 23W. Third World Literatures (6-6-6)

A writing-intensive version of TWS 21, 22, 23 that teaches writing and analytical skills in conjunction with the study of cultures of various Third World countries through close reading of selected literary texts.

### 24. Origins and Consequences of Underdevelopment (4)

(Same as History 24.) The history of the Third World peoples of Asia, Africa, and Latin America is surveyed from the fifteenth century to 1900. It traces the origins of European empires, the interrelationships between these empires and the process of underdevelopment, the meaning of imperialism as an experience shared by Third World peoples, and the beginning of indigenous resistance to imperialism.

### 24W. Origins and Consequences of Underdevelopment (6)

(Same as History 24W.) A writing-intensive version of Third World Studies 24 that teaches writing and analytical skills in conjunction with the study of the history of the Third World peoples of Asia, Africa, and Latin America (surveyed from the fifteenth century to 1900).

### 25. China and the West in Modern Times (4)

(Same as History 25.) This course surveys the eighteenth-, nineteenth-, and early twentieth-century history of China. Special emphasis is placed on the nature of the various Chinese responses to the political, economic, and cultural impact of the West on traditional Chinese society. (W)

### 25W. China and the West (6)

(Same as History 25W.) A writing-intensive version of TWS 25 that teaches writing and analytical skills in conjunction with the study of eighteenth-, nineteenth-, and early twentieth-century China.

### 26. Third World: Nationalist Rebellions and Economic Development (4)

(Same as History 26.) The course surveys the attempts of nationalist movements to seize power in Africa, Asia and Latin America, and to then design economic programs capable of simultaneously fomenting growth and a more equitable distribution of income. The means by which such movements take power will take up the first part of the course; the second part is devoted to their economic problems. The revolutions in China, Cuba, Vietnam, Kenya, and Chile are among the cases that will be examined in detail. (S)

### 26W. Third World-Nationalist Rebellions and Economic Development (6)

(Same as History 26W.) A writing-intensive version of TWS 26 that teaches writing and analytical skills in conjunction with the study of nationalist movements in Africa, Asia, and Latin America.

## Upper Division

### 130. Political Ideology and the Third World (4)

This course studies the concepts of ideology and political consciousness with special attention to their application to the situation of Third World peoples abroad and of the black national minority within the U.S.

### 132. Literature and Third World Societies (4)

This course will investigate novelistic and dramatic treatments of European society in the era of nineteenth-century imperialism. Third World societies under the impact of colonialism, and the position of national minorities inside the United States to the present day. Attention will center on the interplay between the aesthetic merits and social-historical-philosophical content of the works read.

### 133. Contemporary Chicano Issues (4)

The course, interdisciplinary in nature, will study the contemporary Chicano experience from cultural, social, and historical perspectives, and provide students with information and understanding of the important characteristics of the Chicano community by providing a critical

analysis of the societal context in which "La Raza" has sought to maintain and develop its culture. *Prerequisite: consent of instructor.*

### 134. Political Philosophies of Third World Leaders (4)

The course is a study and comparison of the political philosophies of modern Third World leaders. Since a major concern of the course is the problems that such leaders have met with the applications of their theoretical preconceptions to the actual political situations, a biographical approach will be taken. Particular attention will be paid to the influence of indigenous non-Western political and religious customs and outlooks on the political viewpoints of the leaders under study.

### 135. Bilingualism: Research and Field Studies (4)

A study of sociolinguistic findings on bilingualism throughout the world and an evaluation of bilingual education theories. The students will also engage in surveys of local communities to assess bilingualism and educational needs of bilingual communities. *Prerequisite: upper-division standing.*

### 190. Undergraduate Seminars (4)

Seminars will be organized on the basis of topics with readings, discussions, and papers. Specific subjects to be covered will change each quarter depending on particular interest of instructors or students. May be repeated for credit.

### 197. Field Work (4)

In an attempt to explore and study some unique processes and aspects of community life, students will engage in research in field settings. Topics to be researched may vary, but in each case the course will provide skills for carrying out these studies.

### 198. Directed Group Studies (2 or 4)

Directed group study on a topic or in a field not included in the regular department curriculum, by special arrangement with a faculty member. *Prerequisite: upper-division standing.*

### 199. Independent Study (2 or 4)

Tutorial, individual guided reading and research projects (to be arranged between student and instructor) in an area not normally covered in courses currently being offered in the department. (P/NP grades only.) *Prerequisites: upper-division standing and consent of instructor.* (F,W,S)

Third World Studies offerings in other departments:

## History

- 140A. Colonial Latin America
- 140B. Emergence of Latin American Nations
- 140C. Latin America in the Twentieth Century
- 140Q. Topics in Latin American Colonial History, 1500-1820
- 143. Brazil: Colony, Empire, Republic
- 144. Argentina: Growth and Development
- 145. Machismo and Matriarchy: Latin American Social Structure
- 146A-B. History of Mexico
- 146Q. Topics in Latin American History, 1820-1910
- 147. Cuba: From Colony to Socialist Republic
- 147Q. Topics in Latin American History since 1910
- 148A. The Urban Culture of South America, 1830-1920
- 148B. The City in South America, 1920-Present
- 149. Egalitarian Revolutionary Movements in Latin America, 1850-Present
- 154Q. Unexplored Problems in Afro-American History
- 155A-B. Social and Economic History of the Southwest
- 155Q. Mexican American History
- 156A-B. The Social History of the American City
- 159A-B. Afro-American History
- 159Q. Afro-American History
- 172. From Gobineau to Fanon: Literature of Racial Supremacy

- 175A. History of Africa to 1980
- 175B. Modern Africa
- 176. History of South Africa
- 177. African Society and the Slave Trade
- 178. Economic History of Africa
- 178Q. Special Topics in African History
- 179. Colonial Rule and African Resistance
- 182. Modern Chinese Revolution 1800-1911
- 183. Modern Chinese Revolution 1911-1949
- 184. History of the People's Republic of China
- 185Q. The Chinese Village in Transition: 1930-1956
- 190Q. Literature of Third World History

## Literature: General

- 135. Novel and History in the Third World
- 136. Introduction to African Oral Literature
- 137. Introduction to Literature and Film of Modern Africa
- 138. Contemporary Caribbean Literature
- 146. Latin American Literature in Translation
- 150. Chinese Literature in Translation

## English

- 182A-B. Development of Afro-American Literature
- 183. Themes in Afro-American Literature
- 184. Afro-American Poetry
- 185. Afro-American Prose
- 186. Harlem Renaissance

## Spanish

- 131. Spanish American Literature: The Colonial Period
- 132. Spanish American Literature: Nineteenth Century
- 133. Spanish American Literature: Twentieth Century
- 134. Argentine Literature
- 135. Mexican Literature
- 136. Peruvian Literature
- 137. Caribbean Literature
- 140. Spanish-American Novel
- 141. Spanish-American Poetry
- 142. Spanish-American Short Story
- 143. Spanish-American Essay
- 144. Spanish-American Theatre
- 150. The Development of Chicano Literature
- 151. Themes and Motifs in Chicano Literature
- 152. Chicano Prose
- 153. Chicano Poetry
- 154. Chicano Theatre
- 160. Spanish Phonetics
- 162. Spanish Language in the U.S.
- 163. Spanish Language in America
- 172. Indigenista Themes in Spanish-American Literature
- 175. Themes in Brazilian Literature

## Music

- 125A-B-C. Black Music in America

## Philosophy

- 152. Philosophy and Literature

## Sociology

- 112. Social Stratification
- 144. Community and Social Change in Africa
- 164. Society in Latin America

## Theatre

141. Modern Black Drama  
142. Chicano Dramatic Literature

Students wishing to include additional related courses from these and other departments should consult a Third World Studies adviser.

## URBAN STUDIES AND PLANNING

235 Third College Humanities Building

### Professors:

Michael E. Parrish, Ph.D. (*History*)  
Faustina Solis, M.S.W. (*Community and Family Medicine*) (*Provost, Third College*)  
Charles W. Thomas, Ph.D. (*Urban Studies and Planning*)

### Associate Professor:

Rae Lesser Blumberg, Ph.D. (*Sociology*)

### Assistant Professors:

Steve Erie, Ph.D. (*Political Science*)  
Robyn S. Phillips, Ph.D. (*Economics*)

### Lecturer with Security of Employment:

Joyce B. Justus, Ph.D. (*Anthropology*)

### Academic Coordinator/Adjunct Assistant Professor:

Lawrence A. Herzog, Ph.D. (*Coordinator, Urban Studies and Planning*)

### Adjunct Lecturer:

Barbara L. Brody, M.P.H. (*Assistant Clinical Professor of Community and Family Medicine*)

### Associated Faculty:

Wayne Cornelius, Ph.D. (*Political Science*)  
Robert F. Engle, Ph.D. (*Economics*)  
Claudio Fenner-Lopez, M.A. (*Communication*)  
David Laitin, Ph.D. (*Political Science*)  
Alan M. Schneider, Ph.D. (*AMES*)

### Visiting Lecturers:

Nico Calavita, D.Arch. (*Urban Design*)  
Thomas Crandall, M.S. (*Environmental Planning*)  
Gustavo Del Castillo, Ph.D. (*Field Research*)  
Phillip T. Gay, Ph.D. (*Social Policy*)  
Joseph Martinez, A.I.A. (*Urban Design*)  
Paul Peterson, J.D. (*Land Use*)  
Martin Stern, Ph.D. (*Transportation, Environmental Planning*)

## The Urban Studies and Planning Program

Many of society's most pressing problems today occur in urban places — the destruction of the environment, energy shortages, inefficient transportation systems, public budgetary crises, rising housing costs, inadequate health care, central city decline, psychological disorder and crime, to name just a few. These issues suggest that in the approaching decades many professional careers will require skilled and knowledgeable urban problem-solvers. The Urban Studies and Planning Program offers a unique multidisciplinary education emphasizing analytical techniques, creative thinking, practical experience, and a sensitivity to the dynamics of metropolitan areas. The program's main features are:

- An innovative curriculum featuring analytical training at the lower-division level in social science research methods and economics.
- Upper-level specializations in various career-related fields ranging from social work and health administration, to law, politics, business, city planning, and architecture.
- A faculty with interests spanning a broad spectrum of intellectual perspectives on cities combined with diverse professional backgrounds and urban policy experience.
- A field studies component which teaches practical skills needed to study the urban environment, and allows students to work on specific policy projects for one or two quarters in selected urban placements in the San Diego region.

The USP major is valuable preparation for careers in many exciting fields, or for graduate studies.

## Careers for Urban Studies and Planning Majors

Health Planning  
Public Administration  
Urban/Regional Planning  
Law  
Public Policy  
Social Services  
Architecture  
Real Estate  
Environmental Studies  
Community Development  
Medicine  
Politics/Government  
Business/Marketing  
Economic Development

## The Urban Studies and Planning Major

A bachelor of arts degree in Urban Studies and Planning will be given to students who satisfactorily complete the general-education requirements of Muir, Revelle, Third, and Warren Colleges in addition to the Urban Studies and Planning courses described below.

The undergraduate program in urban studies and planning requires: three courses in lower-division urban studies and planning; three in lower-division economics; and twelve in upper-division urban studies and planning. *Where possible, students are encouraged to complete the lower-division prerequisites before they enroll in the upper-division courses.* In accordance with campus academic regulations, courses used to satisfy the major cannot be applied toward a minor, although some overlap is allowed for double majors. Students may elect to take the lower-division economics prerequisites on a Pass/Not Pass basis. All other lower-division and upper-division requirements must be taken on a letter grade basis. A 2.0 grade-point average is required for all courses in the major. Transfer students should see an urban studies and planning adviser to determine whether courses taken elsewhere satisfy USP program requirements.

### Lower-Division Requirements

Students majoring in urban studies and planning must complete the introductory sequence USP 10, 11, and 12. In addition, they must complete either Economics 1A-B-C or Economics 2A-B-C. Economics 4 may be substituted for 1C or 2C.

### Upper-Division Requirements

The upper-division requirements in urban studies and planning consist of five foundation courses which give the conceptual tools of the major; two field study courses which enable students to integrate theory and practice in a community setting under supervision; an area of concentrated study; and, a senior seminar where students complete a major research paper.

### Foundation Courses:

- USP 101: Applied Statistics for Urban Studies and Planning (4)  
USP 102: Urban Economics (Economics 135) (4)  
USP 107: Urban Politics (Political Science 102E) (4)  
USP 131: Community Dynamics and Ethnicity (4)  
USP 186A: Methods of Urban Planning Fieldwork (6)

## URBAN STUDIES AND PLANNING

**Fieldwork:** Students are required to take six units of urban fieldwork seminar (USP 186B) and six units of internships (USP 186C) under the direction of the field studies instructor. These eight units should be taken consecutively. Students may elect to take an additional four units of internship through independent study with the approval of their faculty adviser.

**USP 186B: Urban Fieldwork Seminar (6)**

**USP 186C: Urban Studies Internship (6)**

**USP 199: Independent Study (4)**

**Senior Seminar:** Students must take the senior seminar as a graduation requirement. In this seminar, students will complete a substantial research paper based upon their fieldwork and internship experience.

### Areas of Concentrated Study

All students majoring in urban studies and planning are required to take four courses in one area of concentrated study. Students are also encouraged to take courses outside their chosen area of concentration on an elective basis.

Four areas of concentrated study are offered in the urban studies and planning major: health and human services; urban policy and planning; environmental studies/urban design, and comparative urbanization.

**Health and Human Services:** Four courses are required for this concentration. At least two of these must be taken from among courses offered in the Urban Studies and Planning Program that relate to health and human services, including:

**USP 118: Poverty in Urban America (4)**

**USP 143: Health Care Organization (4)**

**USP 144: Preventive Health Care (4)**

**USP 145: Aging: Social and Health Policy Issues (4)**

**USP 146: Case Studies in Health Care Programs: Children (4)**

**USP 147: Case Studies in Health Care Programs: Low Income (4)**

**USP 148: Health Policy and Planning (4)**

**USP 152: Adult Development and Aging (4)**

**USP 153: Society, Motivation and Personality (4)**

These offerings may change from year to year.

Students also are encouraged to enroll in courses from other departments that relate to health and human services. These might include:

**Political Science 164: The Politics of Medicine and Health (4)**

**Political Science 164B: The Politics of Health and Safety Regulation (4)**

**Political Science 166CA: Politics of Education (4)**

**Political Science 166FO: Inequality and Public Policy (4)**

**Economics 137: Inequality of Poverty (4)**

**Economics 138: Economics of Health**

**Psychology 138: Alcohol and Other Drugs of Addiction (4)**

**Sociology 135: Sociology of Health and Illness (4)**

**Sociology 136: Sociology of Mental Illness (4)**

**Sociology 137: International Health and Economic Development (4)**

**Sociology 141: Crime and Society (4)**

**Sociology 143: Suicide (4)**

**Sociology 144: Forms of Social Control (4)**

**Sociology 152: Urban Social Problems (4)**

**Sociology 153: The Urban Underclass (4)**

**Sociology 154: International Social Problems (4)**

Other courses may be used to meet the requirement with prior approval. Note that some courses are not offered in all years and others require prerequisites.

**Urban Policy and Planning:** Four courses are required for this concentration. At least two of these must be taken from among courses offered in the Urban Studies and Planning Program that relate to urban policy and planning, including:

**USP 105: Environmental and Urban Planning Problems: The U.S.-Mexico Border Region (4)**

**USP 106: Contemporary Urban Issues (4)**

**USP 108: Regional Planning and International Development (4)**

**USP 115: Urban Transportation Planning (4)**

**USP 117: The Technology of Cities (4)**

**USP 123: Housing Policy (4)**

**USP 124: Land Use Planning (4)**

**USP 125: Topics in Urban Planning (4)**

**USP 171: Practical Urban Land Use Problems (4)**

**USP 174A: Introduction to Urban Design (4)**

**USP 174B: Practice in Urban Design (4)**

These offerings may change from year to year.

Students also are encouraged to enroll in courses from other departments that relate to urban policy and planning. These might include:

**Political Science 103A: California Government and Politics (4)**

**Political Science 160AA: Introduction to Policy Analysis (4)**

**Political Science 160AB: Introduction to Policy Analysis (4)**

**Political Science 166E: Taxing, Spending, and Federalism (4)**

**Economics 131: Economics of the Environment (4)**

**Economics 134: Regional Economics (4)**

**Economics 150: Economics of the Public Sector: Taxation (4)**

**Economics 151: Economics of the Public Sector: Expenditures (4)**

**Economics 170: Management in the Public Sector (4)**

**Sociology 152: Urban Social Problems (4)**

**Sociology 155: City of San Diego (4)**

Other courses may be used to meet the requirement with prior approval. Note that some courses are not offered in all years and others require prerequisites:

**Environmental Studies/Urban Design:**

Four courses are required for this concentration. At least two of these should be taken from among courses offered in the Urban Studies and Planning Program re-

lating to the field of environmental studies and urban design, including:

**USP 105: Environmental and Urban Planning Problems: The U.S.-Mexico Border Region (4)**

**USP 124: Land Use Planning (4)**

**USP 173: History of Urban Planning and Design (4)**

**USP 174A: Introduction to Urban Design (4)**

**USP 174B: Practice in Urban Design (4)**

**USP 175: Environmental Problems of Urban Studies (4)**

**USP 117: The Technology of Cities (4)**

New courses in this area of concentration will be offered from year to year. Students may also do an Independent Study Project (USP 199) which focuses on an environmental or urban design topic.

Students also are encouraged to take courses from other departments that relate to environmental studies and urban design. These might include:

**Economics 131: Economics of the Environment (4)**

**Biology 20: Ecology and Man**

**Political Science 164B: The Politics of Health and Safety Regulations**

**Political Science 166B: Energy Policy and Politics**

**Political Science 166D: Marine Policy**

**Comparative Urbanization:** Four courses are required for this concentration. At least two of these should be taken from among courses offered in the Urban Studies and Planning Program that relate to comparative urbanization, including:

**USP 100: Social and Cultural Patterns of Urban Life (4)**

**USP 105: Environmental & Urban Planning Problems: The U.S.-Mexico Border Region (4)**

**USP 150: The Black Ghetto (4)**

**USP 151: Social-Psychological Aspects of Black Identity (4)**

**USP 170: Social Evolution and Economic Development (4)**

These offerings may change from year to year.

Students also are encouraged to take courses from other departments that relate to comparative urbanization. These might include:

**Anthropology 16: Anthropology of the City (4)**

**Anthropology 111: Modernization and Development (4)**

**Anthropology 116: Urban Anthropology (4)**

**History 144: Argentina: Growth and Development (4)**

**History 148A: The Urban Culture of South America (4)**

**History 148B: The City of South America (4)**

**Political Science 138A: The Political Economy of Urbanization (4)**

**Sociology 121: Economy and Society (4)**

**Sociology 128: Population and Society (4)**

**Sociology 151: Comparative Race and Ethnic Relations (4)**

**Sociology 152: Urban Social Problems (4)**

**Sociology 153: The Urban Underclass (4)**

**Sociology 154: International Social Problems (4)**

**Sociology 155: City of San Diego (4)**

**Sociology 169A-B: The Culture of Cities (4-4)**

**Sociology 181: Modern Western Society (also cross-listed as Political Science 125A)**

**Sociology 188: Community and Social Change in Africa (4)**



Other courses may be used to meet the requirement with prior approval. Note that some courses are not offered in all years. Others may require prerequisites.

## The Minor Program

The urban studies and planning minor consists of six courses in urban studies and planning. These include at least two courses from the lower-division sequence:

**USP 10: Comparative Urbanization (4)**

**USP 11: Urban American Society (4)**

**USP 12: Introduction to Urban Planning (4)**

plus four upper-division USP courses selected with the approval of a faculty adviser.

## Courses:

### Lower Division

#### 10. Comparative Urbanization (4)

Historical and comparative survey of cities throughout the world. Ecological, social, economic, technological, and cultural determinants of city location, form, growth, and decline. Urbanization movement following the Industrial Revolution. Role of the city as a force of culture and civilization. (F)

#### 10W. Comparative Urbanization — Writing Practicum (6)

A writing-intensive version of USP 10 that teaches writing and analytic skills in conjunction with the study of historical and comparative survey of cities throughout the world.

#### 11. Urban American Society (4)

An introduction to the sociological study of cities, focusing on the development of urban society in the U.S. The course will address: (1) the origins, growth and transformation of cities in the U.S.; (2) theoretical approaches to the study of urban life; (3) the organization of power — urban politics and economy, social stratification and class conflict, the mass media; (4) urban social and cultural systems — suburbia, family life in the city, religion, education, art and leisure; (5) urban social problems — crime, poverty, racism, welfare, health, housing, transportation, and the environment; and (6) current urbanization trends and the future of urban society. (W)

#### 11W. Urban American Society — Writing Practicum (2)

An intensive writing course accompanying USP 11 (Urban American Society) which teaches writing skills focused on topics related to cities in American society.

#### 12. Introduction to Urban Planning and Policy (4)

An introduction to the field of urban planning and policy. Emphasis is placed upon the physical city, urban design elements and the geographic dimensions of cities. Both macro- and micro-level aspects of urban planning are explored, with a focus on functional planning questions. Students will be exposed to the field of regional planning, theories of structure, housing, neighborhood formation and the urban environment. Urban policy issues addressed include: transportation, land use, environmental quality, government structure. Special attention is given to the San Diego-Tijuana region. (S)

#### 12W. Introduction to Urban Planning — Writing Practicum (2)

An intensive writing course aimed at improving student writing skills using topics related to the theme of urban planning, urban design, and the environment. To be taken with USP 12.

### Upper Division

#### 101. Applied Statistics for Urban Studies and Planning (4)

Introduction to statistical and quantitative methods using applications from urban studies, planning, and policy analysis. Includes descriptive statistics, measures of association, in-

ference, hypothesis testing, statistical significance and linear regression. Required of USP majors who have not previously taken USP 60 or Psychology 60.

#### 102. Urban Economics Problems (4)

(Same as Econ. 135.) Analysis of causes of congestion, pollution, housing and discrimination and segregation, crime, etc., and of public policies to deal with these problems. *Prerequisite: one year of lower-division economics.*

#### 105. Environmental and Urban Planning Problems: The U.S.-Mexico Border (4)

Course addresses the key environmental and city planning problems facing the U.S.-Mexico border region. After establishing a historical, geographic, and demographic context for the border region, the course focuses on the following themes: comparative economic base, political systems, environmental problems (water, air pollution, sewage management), city planning issues (transportation, land use, housing, industrial development), twin cities, San Diego, and Tijuana. *Prerequisite: none. (USP 10, 11, or 12 recommended.)*

#### 106A-B-C. Contemporary Urban Issues (4-4-4)

A research-oriented course focusing on institutions and communities in the urban area. Readings will be drawn from social science studies on urban issues and from studies on policy and planning. It integrates theoretical approaches to the study of various urban issues with applied supervised research. *Prerequisites: upper-division standing and consent of instructor. See department.*

#### 107. Urban Politics (4)

(Same as Political Science 102E.) This survey course focuses upon the following six topics: the evolution of urban politics since the mid-nineteenth century; the urban fiscal crisis; federal/urban relationships; the "new" ethnic politics; urban power structure and leadership; and selected contemporary policy issues such as downtown redevelopment, poverty, and race. *Prerequisite: upper-division standing or consent of instructor.*

#### 108. Regional Planning and International Development (4)

An introduction to the theories and techniques of analysis central to the field of regional planning. Discussions include the following topics: location theory and economic development, central place theory; urban hierarchies; urban systems, gravity models, regional-industrial composition; economic base; input-output analysis; growth pole theory; regional growth theory. The course also provides practical examples of the use of these techniques in international development planning in Latin America. *Prerequisite: none.*

#### 115. Urban Transportation Planning (4)

An introduction to the field of transportation planning in cities. Lectures will cover the history of urban transport, transport and land use models; and economic and technical discussion of the viability of specific modes of transport including buses, electric transit, private automobiles, taxis, trucks, bicycle, and pedestrian movement. *Prerequisite: upper-division standing.*

#### 117. The Technology of Cities (4)

A lecture-discussion course which introduces students to the economic and technological problems associated with the provision of crucial urban services, especially transportation, energy, water, and waste disposal. The course will be of special interest to students interested in pursuing careers in physical urban planning and in urban public administration or applied economics.

#### 118. Poverty in Urban America (4)

A lecture-discussion course investigating the primary causes of poverty in urban America, the social, psychological, and political consequences for society, and the attempts, both public and private, to alleviate poverty during the past half century. *Prerequisite: none.*

#### 120. Urban Social Problems (4)

(Same as Sociology 152.) Concerns the facts and theories of contemporary urban social problems in the United States. The emphasis will be on social problems, not on urbanism. Topics may include: urban poverty; inequality based on sex, age and race; crime and deviance; urban environment, pollution, housing, transportation, and health; fiscal crisis and the politics of municipal finance, including the role of ideology and interest groups in the definition of social problems. *Prerequisite: any lower-division sociology course.*

#### 123. Housing Policy (4)

(Same as Econ. 133.) Examines current issues in housing policy; housing finance, rent control, neighborhood decline and revitalization, gentrification and displacement, home-ownership affordability, segregation and discrimination, and low-income housing. *Prerequisite: one year of lower-division economics.*

#### 124. Land Use Planning (4)

Introduction to land use planning in the United States: zoning and subdivision, regulation, growth management, farmland preservation, environmental protection, and comprehensive planning. *Prerequisite: upper-division standing or consent of instructor.*

#### 125. Topics in Urban Planning (4)

Seminar on selected topics in urban planning, such as downtown redevelopment, transportation policy or planning in Third World countries. Topics to be covered will be announced at the beginning of the quarter. *Prerequisite: upper-division standing or consent of instructor.*

#### 131. Community Dynamics and Ethnicity (4)

An examination of the interaction of migration and urbanization on community as a social system. Characteristics of agencies and organizations which deliver services or influence changes will be approached from the use of ethnicity as a conceptual model. *Prerequisites: USP 131L (concurrently), upper-division standing, USP major, consent of instructor. See department.*

#### 131L. Community Dynamics and Ethnicity Lab (2)

Models for human service delivery, community development, action, and planning will be taught through exercises and individual projects. *Prerequisite: USP 131 concurrent enrollment.*

#### 143. Orientation to Health Care Organization (4)

This course will provide an overview of the organization of health care within the context of the community with emphasis on the political, social, and cultural influences. It is concerned with the structure, objectives, and trends of major health and health-related programs in the United States to include sponsorship, financing, training and utilization of health personnel. *Prerequisite: upper-division standing or consent of instructor. (F)*

#### 144. Preventive Health Care (4)

This course will analyze needs of populations; highlighting current major public health problems such as chronic and communicable diseases, environmental hazards of diseases, psychiatric problems and additional diseases, new social mores affecting health maintenance, consumer health awareness and health practices, special needs of economically and socially disadvantaged populations. The focus is on selected areas of public and environmental health, namely: epidemiology, preventive services in family health, communicable and chronic disease control, and occupational health. *Prerequisite: upper-division standing or consent of instructor. (W)*

#### 145. Aging — Social and Health Policy Issues (4)

This course will provide a brief introduction to the nature and problems of aging with emphasis on socio-economic and health status; determinants of priorities of social and health policies will be examined through analysis of the structure and organization of selected programs for the elderly. Field visits will constitute part of the course. *Prerequisites: upper-division standing, consent of instructor. (S)*

#### 146. Case Studies in Health Care Programs/Children and Families (4)

The purpose of this course is to identify the special health needs of children, youth and families and to review their status of care, factors influencing incidence of disease and health problems, and political and legislative measures related to the provision of care. Selected programs and policies that address health promotion and current health problems such as developmental disabilities, child abuse, teenage pregnancies and injuries will be analyzed. Offered in alternate years. *Prerequisite: upper-division standing or consent of instructor.*

#### 147. Case Studies in Health Care Programs/Poor and Underserved (4)

The purpose of this course is to identify the special health needs of low income and underserved populations and to review their status of care, factors influencing the incidence of disease and health problems, and political and legislative measures related to access and the provision of care. Se-



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lected current programs and policies that address the health care needs of selected underserved populations such as working poor, inner city populations, recent immigrants and persons with severe disabling mental illnesses will be studied. Offered in alternate years. *Prerequisite: USP 143 or consent of instructor.*

### 148. Health Policy and Planning (4)

Outlines determinants of community health, trends in health needs and resources, evaluates performance in meeting needs, analyzes factors accounting for performance, and explores means and prerequisites for improving that performance. Focus on San Diego. *Prerequisites: USP 144A-B, upper-division status or consent of instructor. (S)*

### 150. The Black Ghetto (4)

Examination of the black ghetto from about 1880 to the present. Trends in migration, the patterns of economic and social adjustment, shifts in ideology and protest, and the demand for community control are themes. *Prerequisite: consent of instructor. See department.*

### 151. Social-Psychological Aspect of Black Identity (4)

This course examines formal theory on personality formation in terms of the life-style of Afro-Americans. Emphasis is devoted to the interdependence between personal characteristics, Afro-American culture, and the social conditions which foster blackness as a personality construct. *Prerequisite: upper-division standing or consent of instructor. See department.*

### 152. Adult Development and Aging (4)

An examination of the developmental stages of early, middle, and late adulthood and their processes of behavior change. Topics include impact of societal and cultural factors, continuity and change in the individual personality, influence of norms and roles, family life, adult sexuality, and ethnicity as a cultural experience in human development.

### 153. Society, Motivation, and Personality (4)

This course will provide an examination of the interplay between values, activities, and emotional components of behavior. Topics to be covered in depth include social support systems, understanding values, motivations and drives, basic needs and their gratification, coping and expression, and psychological health. *Prerequisites: USP 152B, upper-division standing, or consent of instructor. See department.*

### 171. Practical Urban Land Use Problems (4)

A lecture-discussion course on the relationship between American legal-institutions and land use policy issues, with special attention to the problems of urban areas and the conflict between private rights and the public interest. Among the topics covered are the legal aspects of zoning, redevelopment, transportation, and the protection of the natural environment. *Prerequisite: none.*

### 173. History of Urban Planning and Design (4)

The analysis of the evolution of city designs over time; study of the forces that influence the form and content of a city; why cities change; comparison of urban planning and architecture in Europe and the United States. *Prerequisite: upper-division standing.*

### 174A. Introduction to Urban Design (4)

(Same as Visual Arts 174.) This course will introduce the elements of urban design and examine the factors necessary for the execution of an urban design plan. Students will look at the city of San Diego as a place of urban design in a structured exercise designed to teach how to examine a city qualitatively from an urban design/urban planning point of view. The special geographical and political forces that help shape San Diego's urban design future will be examined through the review of current planning projects. The possibilities of what may be done to enhance urban design in San Diego will also be examined. *Prerequisite: upper-division standing.*

### 174B. Practice in Urban Design (4)

Through seminars and related studio work, lectures and case studies, the course will focus on the approaches toward complex interrelationships of land use programs, infrastructure, transportation issues, public open space, economic feasibility, social values, and aesthetics which will be investigated and related to the understanding of public benefits and private enterprise. The studio section of the course will deal with determining optimum building envelope relationships, site organization, ambience, environmental chart, image, and user needs in selected urban areas. Particular attention will be paid to developing skills in communication concepts and ideas. *Prerequisite: upper-division standing or consent of instructor.*

### 175. Environmental Problems of Urban Studies (4)

Man's activities have had dramatic impact upon the natural resources of California's urban areas. The class will focus upon the nature and extent of such impacts with an emphasis on evaluating the current status of resource-related planning on management efforts. Major themes will include politics of resource protection; provision of parks and open space; preserving natural area; wildlife management; air and water quality issues; land use planning by state agencies; protecting agricultural lands and guiding the location of new development. The goal of the course is to provide the student with a better understanding of the ways in which the natural resources of urban areas are being protected and planned for by government agencies and the limitations of current programs. *Prerequisite: upper-division standing.*

### 186A. Methods of Urban Planning Fieldwork (6)

An introduction to the principal qualitative methods of social science practice and their application to the study of urban planning issues in the San Diego metropolitan region. Students will systematically learn how to use interviews, surveys, participant and systematic observation, and other measurement techniques in the field. Weekly exercises will include such topics as: land use surveys, traffic monitoring, environmental quality analysis, housing inventory, political behavior analysis. *Prerequisites: senior standing, must be USP major. Departmental stamp required.*

### 186B. Urban Fieldwork Seminar (6)

Application of field research skills to neighborhood level projects in the San Diego metropolitan area. Emphasis on: a) the development of a body of theoretical literature prior to carrying out field research; b) organization of survey research instruments for field research and systematic testing of survey tools; c) actual field research in three stages with oral and written reports monitoring student progress.

### 186C. Urban Studies Internships (6)

Students work with the field studies instructor in the Urban Studies and Planning Program and select an internship with a local planning agency or other professional activity pertinent to their career interests. Students spend ten hours per week as interns with the agency. Students must prepare a paper reporting on their internship experience. *Prerequisites: USP 186B, senior standing, departmental stamp required.*

### 190. Senior Seminar (4)

Based upon their previous fieldwork courses and internship, students will write a substantial research paper on a current urban policy issue. The seminar will rotate from year-to-year among the faculty in urban studies and planning. *Prerequisites: USP 186B, senior standing.*

### 198. Directed Group Study (2-4)

Directed group study on a topic or in a field not included in the regular departmental curriculum by special arrangement with a faculty member. *Prerequisites: upper-division standing and consent of instructor.*

### 199. Independent Study (2-4)

Reading and research programs and field-study projects to be arranged between student and instructor, depending on the student's needs and the instructor's advice in terms of these needs. *Prerequisites: upper-division standing and consent of instructor.*

## VISUAL ARTS

OFFICE: 216 Mandeville Center for the Arts

### Professors:

David Antin, M.A.  
Eleanor Antin, B.A.  
Harold Cohen, Diploma of Fine Arts  
Manny Farber  
Helen Mayer Harrison, M.A.  
Newton Harrison, M.F.A.  
Madlyn M. Kahr, Ph.D. (*Professor Emeritus*)  
Allan Kaprow, M.A.  
Faith Ringgold, M.A.  
Italo Scanga, M.A.

### Associate Professors:

Jean-Pierre Gorin, Licence de Philosophie  
Louis Hock, M.F.A.  
Standish Lawder, Ph.D.  
Fred Lonidier, M.F.A.  
Sheldon Nodelman, Ph.D.  
Patricia Patterson  
Philip Steinmetz  
Jehanne Teilhet-Fisk, Ph.D.

### Assistant Professors:

Jack Greenstein, Ph.D.  
Chip Lord, B.A.  
Adrienne von Lates, M.A.

### Lecturer:

Claudio Fenner-Lopez, M.A.

The Department of Visual Arts offers courses in painting, drawing, sculpture, performance, film, video, photography, and art history/criticism (including that of film and video). A bachelor's degree from this department provides students with a solid liberal arts background and is preparatory training for careers as artists, art historians, filmmakers, video artists, photographers, and art critics. It also provides students the initial skills required for teaching and work in museums, television, and the commercial film and photography industries.

By its composition, the Department of Visual Arts is biased in the direction of actively producing artists and critics whose presence at the center of the contemporary art world necessitates reconsideration and reevaluation of artistic productions, their information structure, and significance. Consequently, a flexible introductory program of historically based courses has been devised mainly to provide the student an opportunity to concentrate on areas involving significantly different esthetic and communication structures. A series of studio courses, in which painting and sculpture are included, is presented to bring the student into direct contact with the real contingencies compelling redistribution of esthetic attitudes and reinterpretation of genres. Because of the exploratory nature of our program, the department is prepared to emphasize new media that would traditionally be considered to have scant relation to the visual arts. Thus courses in theatrical events, linguistic structures, etc., are provided. In this context, theoretical courses with a media orientation, as in film, video, or photography, are offered also.

The Department of Visual Arts is located in the Mandeville Center for the Arts, which provides faculty offices and

studio spaces for graduate students. In addition, many of the faculty have studios near Warren campus, and undergraduate studio courses are conducted nearby. Facilities and equipment are available to undergraduates in both the Mandeville Center and at the campus-wide Media Center, providing the opportunity to study painting, drawing, photography, 16mm film, performance, sculpture, and video. Facilities at the Media Center include black and white and color portable video camera and editing equipment, as well as black/white and color video studios. The department also has the in-house capacity to process black and white 16mm film. Additional film equipment available includes an animation stand, optical printer, and two sound-mixing studios.

The campus-wide Slide Library is located on the lower level of the Mandeville center with holdings in excess of 85,000 slides. The Mandeville Art Gallery displays a continually changing series of exhibitions, and the Mandeville Annex Gallery, located on the lower level, is directed by visual arts graduate and undergraduate students.

## The Undergraduate Program

### College Requirements

The Department of Visual Arts teaches courses applicable toward the Muir and Warren general-education requirements, the Third humanities requirement, the Revelle fine arts requirement, and the Revelle minor.

### Minor Visual Arts

The Department of Visual Arts offers minors in several areas of study: studio painting/drawing/sculpture, photography, European art history, Non-Western art history, media history/criticism and film/video. A minor consists of six specific courses of which at least three must be upper-division. Prospective visual arts minors should consult with the departmental adviser for assistance in planning an appropriate minor.

### Residency Requirements

A minimum of 50 percent of the course work completed for the major must be taken as a registered student at UCSD.

Visual Arts 14, Nineteenth-and Twentieth-Century Art, and Visual Arts 111, Structure of Art, are required courses for transfer students.

NOTE: Rarely are transfer credits accepted toward fulfilling Group III requirements under the studio major.

## Studio Major

The studio major is aimed at producing a theoretically based, highly productive group of artists. Lower-division courses are structured to expose students to a variety of ideas in and about the visual arts. Introductory skills are taught, but their development will occur at the upper-division level in conjunction with the student's increasing awareness of the range of theoretical possibilities in the field. The curriculum includes courses in drawing, painting, sculpture, performance, photography, video, 16mm film, as well as many offerings in art history/criticism.

NOTE: All major course work must be taken for a letter grade.

### Group I: Lower-Division

(Foundation Level)

Six courses required:

- \*1 Introduction to Art Making
- \*2 Introduction to Art Making
- \*3 Introduction to Art Making
- \*/\*\*14 Nineteenth- and Twentieth-Century Art
- \*Choice of any two:
  - 11 Western Art I: Prehistoric to Medieval
  - 12 Western Art II: Medieval to the Present
  - 13 Non-Western Art
  - 84 History of Film

\*Required for all studio majors.

\*\*Required for all transfer majors.

### Group II: Upper-Division

(Foundation Level)

- \*/\*\*111 Structure of Art
  - \*Required for all studio majors.
  - \*\*Required for all transfer majors.

(Beginning Level)

Four courses required (Note: Visual Arts 1, 2, 3 and 14 or 111 must be completed before taking Group II courses). Choose four from:

- 60 Introduction to Photography
- 70 Introduction to Media
- 104A Performance
- 105A Beginning Drawing
- 106A Beginning Painting
- 107A Beginning Sculpture

NOTE: Students planning a program involving film and/or video must take VA 70, Introduction to Media.

### Group III: Upper-Division Studio

(Intermediate and Advanced Level)

Five courses required. Any upper-division studio courses, other than those listed under Group II, such as Intermedi-

ate Drawing, Photographic Strategies, or 16mm Film Strategies satisfy these requirements. Check with department for full course listings.

### Group IV: Upper-Division Non-Studio

Four courses required. Upper-division media history/criticism and art history/criticism courses such as Hard Look at the Movies, Renaissance Art, or Contemporary Art satisfy these requirements. Check with department for full course listings.

## Art History/Criticism Major

The major in art history and criticism is designed both for students who desire a broadly based education in the humanities and for those who plan to pursue a career in an art-related profession. In both cases, the foundation for study is proficiency in the languages of artistic expression. Through the study of art history, students learn to treat works of art as manifestations of human belief, thought, and experience in Western and non-Western societies from prehistory to the present day. Courses in criticism review the theoretical approaches which are used to understand artistic achievement. By combining art historical and critical study, the program promotes in the student an awareness of the cultural traditions which have shaped his or her intellectual outlook and provides a framework for informed judgment on the crucial issues of meaning and expression in contemporary society.

Majors are encouraged to take relevant courses in allied disciplines such as history, communication, anthropology, and literature, and in such area programs as classics and Italian studies. In addition, students who plan to apply to graduate schools are strongly advised to develop proficiency in one or more foreign languages, as is dictated by their area of specialization.

**Program Requirements:** Twenty courses in art history and criticism are required for the attainment of the bachelor of art degree in this program. Seven of these are lower-division courses and thirteen are upper-division courses, as explained below. Students who transfer to UCSD in their second or third year may petition to substitute courses taken at other colleges or universities for our lower-division requirements. However, they must show that the courses they have successfully completed are comparable to our own.

## VISUAL ARTS

### FOUNDATION LEVEL — Lower-Division

(7 courses required)

- Western Art I: Prehistoric to Medieval (VA 11)
- Western Art II: Medieval to the Present (VA 12)
- Non-Western Art (VA 13)
- Nineteenth- and Twentieth-Century Art (VA 14)
- Introduction to Photography (VA 60)
- History of Film (VA 84)
- Introduction to Art Making (VA 1 or 2 or 3 or 4)

### ADVANCED LEVEL — Upper-Division

(13 courses required)

#### GROUP I — Required Courses

(2 courses)

These two courses are required for all art history and criticism majors:

- VA 111—Structure of Art
- \*VA 112—Art Historical Methods

\*Normally, VA 112 is taken during the third year after completing requirements listed under Group II—Distributional Requirement.

#### GROUP II — Distributional Requirement (5 courses)

One course from each of the following areas:

##### A. Criticism and Theory

- 113A History of Criticism I
- 113B History of Criticism II
- 113C History of Criticism III

##### B. Ancient

- 120A Greek Art
- 120B Roman Art
- 120C Late Antique Art

##### C. Medieval/Renaissance/Baroque

- 122A Art of the Middle Ages
- 122B Renaissance Art
- 122C Baroque Art

##### D. Modern

- 124A Art of the Eighteenth Century
- 124B Art of the Nineteenth Century
- 124C Art of the Twentieth Century

##### E. Non-Western

- 126A African and Afro-American Art
- 126B Polynesian Art
- 126C Melanesian Art
- 126D Art of the Southwest American Indians

#### GROUP III — Area Specialization

(2 courses)

Two courses in one area of specialization from the following list. At least one of

these must be a seminar (indicated by \*). In seminars, students will be expected to give reports and undertake independent research.

##### A. Criticism and Theory

All courses listed under Group II.A.

- 113D History of Criticism IV
- 114 Art Criticism
- \*115 Semiotics
- \*117 Narrative Structure in the Visual Arts
- 128A Topics in Art Criticism and Theory
- \*129A Special Problems in Art Criticism and Theory

##### B. Ancient

- 121A Prehistoric Art
- \*121B Greek Painting
- 128B Topics in Ancient Art
- \*129B Special Problems in Ancient Art

##### C. Medieval/Renaissance/Baroque

- 123A Italian Art of the Early Renaissance
- 123B High Renaissance Art
- 123C Michelangelo
- \*123D The City in Italy
- 128C Topics in Medieval, Renaissance, and Baroque Art
- \*129C Special Problems in Medieval, Renaissance, and Baroque Art

##### D. Modern

- 125A Issues and Trends in American Art
- 125B Modernist European Painting
- 125C Matisse and Picasso
- 125D Contemporary Art
- \*125E History of Performance Art
- 125F History of Twentieth-Century Sculpture
- \*125G American Folk Art
- 128D Topics in Modern Art
- \*129D Special Problems in Modern Art

##### E. Non-Western

All courses listed under Group II.E.

- \*127A Architecture, Myth, and Power
- \*127B Western and Non-Western Rituals and Ceremonies
- \*127C Female Artists and Female Imagery
- 127D Primitivism and Exoticism in Modern Art
- 128E Topics in Non-Western Art
- \*129E Special Problems in Non-Western Art

#### GROUP IV — Electives

(4 courses)

Four additional courses in art history and criticism from the following list.

All courses listed in Groups II and III, as well as courses in history and criticism of film, photography, and video:

- VA 150 History and Art of the Silent Cinema
- VA 151 History of Experimental Film
- VA 152 Film in Social Context
- VA 153 The Genre Series
- VA 154 Hard Look at the Movies
- VA 155 The Director Series
- VA 157 Video History and Criticism
- VA 158 Critical History of Twentieth-Century Photography

\*indicates seminar

### Media Major

The program is designed for students who want to become creative videomakers, filmmakers, and photographers. It combines hands-on experience of making art with practical and theoretical criticism, provides historical, social and esthetic backgrounds for the understanding of modern media, and emphasizes creativity, versatility, and intelligence over technical specializations. It should allow students to go on to more specialized graduate programs in the media arts, to seek careers in commercial film, television or photography, or to develop as independent artists.

### FOUNDATION LEVEL — Lower-Division

(7 courses required)

#### Group A

- VA 1,2,3 or 4 Introduction to Art Making
- VA 14 Nineteenth- and Twentieth-Century Art
- VA 84 History of Film
- Comm/Gen 20 Introduction to Communication

#### Group B

- VA 60 Introduction to Photography
- VA 70 Introduction to Media I (Technique/History)
- VA 71 Introduction to Media II (Theory)

A total of seven courses from Groups A and B are required. Any and all courses except VA 70, 71, and 174 can be taken simultaneously. VA 70 is prerequisite for use of the Media Center. No further production courses can be taken until both 70 and 71 are completed.

### INTERMEDIATE LEVEL — Upper-Division

(7 courses total required)

#### Group A

(5 courses required)

|        |                  |
|--------|------------------|
| VA 111 | Structure of Art |
| VA 174 | Media Sketchbook |

Both VA 111 and VA 174 are required and prerequisite to further study. Additionally, any three of the emphasis courses are required, but two of these must be from one emphasis.

#### Film/Video Emphasis:

|        |                        |
|--------|------------------------|
| VA 172 | — Studio Video         |
| VA 173 | — Field Video          |
| VA 186 | — 16mm Film Strategies |

#### Photography Emphasis:

|        |                     |
|--------|---------------------|
| VA 165 | — Camera Techniques |
| VA 167 | — Photo Strategies  |

#### Group B — History, Criticism, and Theory

(2 courses required)

|        |   |
|--------|---|
| VA 150 | History and Art of the Silent Cinema              |
| VA 151 | History of Experimental Film                      |
| VA 152 | Film in Social Context                            |
| VA 153 | The Genre Series                                  |
| VA 154 | Hard Look at the Movies                           |
| VA 155 | The Director Series                               |
| VA 157 | Video History and Criticism                       |
| VA 158 | Critical History of Twentieth-Century Photography |

NOTE: VA 158 is required for all students with photography emphasis.

#### ADVANCED LEVEL — Upper Division

(6 courses required)

|        |                                  |
|--------|----------------------------------|
| VA 177 | Scripting and Editing Strategies |
| VA 178 | Experimental Media               |
| VA 179 | Narrative Media                  |
| VA 180 | Documentary Media                |

Any of these are repeatable for credit. Two of the above are required before VA 109 or 131 can be taken. The final two courses can be fulfilled by repeating any of the Advanced Level courses listed above, or can be taken from the following list of electives.

#### Electives

The following two courses can be taken only with the approval of the instructor and are not required:

|        |                            |
|--------|----------------------------|
| VA 109 | Advanced Projects in Media |
| VA 131 | Special Projects in Media  |

#### Film and Video:

|        |                    |
|--------|--------------------|
| VA 181 | Sound and Lighting |
| VA 182 | Advanced Editing   |
| VA 187 | Animation          |
| VA 188 | Optical Printing   |

#### Photography:

|        |                   |
|--------|-------------------|
| VA 166 | Camera Techniques |
| VA 168 | Color Techniques  |

A total of twenty courses are required for the media major:

- 7 Foundation Level
- 7 Intermediate Level
- 6 Advanced Level

#### Master of Fine Arts Program

The program is designed to provide intensive professional training for the student who proposes to pursue a career within the field of art — including art making, criticism, theory. The scope of the UCSD program includes painting, sculpture, performance, environmental art, photography, film, video, and computer media. The program is unique in that the course of study provides for and encourages a student mobility within this range of traditional and media-based components. It also offers opportunities for collaborative work.

The educational path of students is focused around their particular interests in art. The department seeks to provide an integrated and comprehensive introduction to the possibilities of contemporary art production, the intellectual structures which underlie them, and the "world view" which they entail. All art-making activities are considered serious intellectual endeavors, and all students in the program find themselves confronted by the need to develop their intellectual and critical abilities in the working-out of their artistic positions. A body of theory-oriented courses is required. Therefore, we have no craft-oriented programs or facilities; nor do we have any courses in art education or art therapy. The courses offered are intended to develop in the student a coherent and informed understanding of the past and recent developments in art and art theory. The program also provides for establishing a confident grasp of contemporary technological possibilities, including those involved in film, photography, and the electronic media.

The program includes formal education in lecture and seminar courses as well as study groups and studio meetings. Course work is intended to place art making in critical and intellectual context but doesn't underestimate the central importance of the student's own work. In fact, this aspect of the student's activity is expected to be self-motivated and forms the core around which the program of study operates and makes sense.

No two students will necessarily follow the same path through the degree program, and the constitution of individual programs will depend upon the analysis of their individual needs and interests, worked out by students in collaboration with their faculty advisers.

#### Admission Requirements

Grade-Point Average — An overall GPA of 3.00 and a 3.50 in a student's undergraduate major is required.

Personal Interview — Interviews may on occasion be requested by the Admissions Committee for prospective candidates.

Art History — Students are expected to have had at least six art or film criticism/history courses at the undergraduate level. Those who have a broader art history background will have a better chance of being awarded teaching assistantships. Students without this requirement can be admitted, but they will be expected to make up the six courses in excess of the seventy-two units required for the degree. If there are questions concerning this requirement, check with the department.

Statement — Students are required to submit an essay of approximately three pages on the direction of their work and its relationship to contemporary art. This essay should be critical in nature, refer explicitly to the student's own work, and may refer to other artists, recent events in art history, and issues in domains other than art that have bearing on the student's process, thought, and work.

Work — Students are asked to submit documentation of their best work in a suitable format such as slides, videotape, film, photographs, etc. These will be returned upon review of the application. Please include a self-addressed, stamped envelope for return of work.

#### Regular University Admission Policies

*Please note that no application will be processed until all required information has been received.* Students should submit applications to the graduate admissions office on or before January 15, 1988. Portfolio, statement, letters of recommendation, and official transcripts should be sent directly to the department.

#### Requirements for the Degree

The M.F.A. is considered the terminal degree in studio work, and is a two to three-year program. The following requirements must be completed in order to receive the M.F.A.:



## VISUAL ARTS

**Departmental Review** — This review takes place in the third or fourth quarter in residence. Students make a formal presentation of their work to a faculty committee; this includes a paper and an oral examination. This presentation is considered a departmental examination, and if at its conclusion the student's work is judged to be inadequate, the student may be dismissed regardless of GPA, or may be reviewed again in the fifth quarter.

Seventy-two units of course work, including a three-unit apprentice teaching course, are required. Students may select twenty-four of these units (six courses) from upper-division course offerings. (See listings in this catalog.) Specific information on course distribution requirements can be obtained from the department.

### The M.F.A. Final Presentation

**Presentation of Work** — During the last quarter in residence, each student is required to present to the public a coherent exhibition or screening of his or her work.

**Oral Examination** — A committee of three Department of Visual Arts faculty members and one tenured faculty member from another department will administer an oral examination to each student covering the student's work and its relationship to the field of art.

**Thesis** — Students are required to submit some form of written work for the M.F.A. degree. Four options are available:

1. **Catalog** — The student would design and have printed an actual catalog. This would include a critical essay of approximately 1,500 words.
2. **Critical paper** — the student would write a critical paper of 3,000 words analyzing his or her process and the relationship of his or her work to recent art history, with references to recent styles and specific artists.
3. **Analytical essay on some phase of art** — Students who have focused on both art production and art criticism would write a 3,000 word critical essay on any current art position. A brief discussion (750 words) of the student's work would also be included.
4. **Critical thesis** — Students whose emphasis is essentially criticism and who do not present an M.F.A. exhibition will write a forty to fifty-page thesis — the topic to be decided by the student and his or her adviser.

Applications and additional information can be obtained from the office of the Department of Visual Arts.

## Courses

**NOTE:** The following list of courses represents all visual arts offerings; not all courses are offered each year.

### Lower Division

#### 1. Introduction to Art Making (4)

An introduction to the process of art making with special reference to the generation of meaning through the juxtaposition of given elements and the interaction between such elements and their immediate and wider contexts. Materials, objects, images, and experience of everyday life will be utilized.

#### 2. Introduction to Art Making (4)

An introduction to the process of art making utilizing the transaction between people, projects, and situations includes both critical reflection on relevant aspects of avant-garde art of the last two decades (Duchamp, Cage, Rauschenberg, Gertrude Stein, conceptual art, happenings, etc.) and practical experience in a variety of artistic exercises.

#### 3. Introduction to Art Making (4)

This course will employ drawing, watercolor painting, found photographs, and verbal material to construct serial and narrative work. Art forms such as cartoon strips, illustrative manuscripts, and photojournalist works will be analyzed and used as models. Studio work will vary in size and format from small hand-made books and scrolls to large wall pieces.

#### 4. Introduction to Art Making (4)

This course will emphasize image making as providing the most essential characteristics of art making, whatever its form or style. Lectures will be designed to introduce students to a number of underlying concepts: the cognitive basis of image-making behavior, the notion of representation as information processing, the functional non-interchangeability of representation modes, and the nature of skill. Studio sessions will present a series of problems and situations designed to give a practical, inside understanding of the significance of these conceptual issues.

#### 11. Western Art I: Prehistoric to Medieval (4)

Works of art are tools through which humanity has struggled to understand and deal with the world, with society, and with the self. This course provides an overview of the development of Western art in its principal phases from the earliest times to the twelfth century A.D., and serves as the foundation for subsequent, more detailed studies in the history of art. Visual images first appear in the cave paintings and carvings of the hunting people of Ice Age Europe — an art of astonishing power and mysterious meaning. The village cultures which subsequently developed in the Near East grew in the Bronze Age into great civilizations, urban, literate, and highly structured, which gave rise to the first monumental art, expressing the new power and confidence of human society. The rational geometry of this Bronze Age art was transformed in the art of classical Greece into the vehicle for a heightened individual self-consciousness, which became more complex and more subjective in the imperial art of Rome. During the early Middle Ages — Byzantine, Carolingian, and Romanesque — new visions of otherworldly spirituality dissolved this classical formal language and recast it as the foundation of later European art. The arts of these cultures will be examined through the analysis of major monuments of architecture, sculpture and painting, with specific attention to the communicative function of the work of art as seen in relation to contemporary society and culture.

#### 12. Western Art II: Medieval to the Present (4)

In the twelfth century, European artists created the first unified and universal visual language since classical antiquity. Though this Gothic style was rejected by later artists, it changed the image of humanity and of the world. Donatello, Leonardo, Raphael, Michelangelo, and others in the Renaissance forged an art of extraordinary power out of a confluence of Gothic visual habits and the classical vocabulary which they sought to reclaim. For nearly two centuries, the language of these early modern artists was extended in scope and adapted to new modes of seeing and thinking by baroque artists such as Caravaggio, Rubens, Rembrandt, Velazquez, and Vermeer. The age of democracy and industrialization, ushered in by the American and French Revolutions, gave rise to a rapid succession of styles. Neoclassicism, romanticism, realism, impressionism and post-impressionism, cubism, dada and surrealism are prod-

ucts of the struggle to find a mode of artistic expression for a world of changing values, new institutions, and unprecedented diversity. Abstract expressionist, pop, minimalist and conceptual artists have taken on the task of grappling with the post-1945 world.

#### 13. Non-Western Art (4)

Nonliterate societies have created modes of art and expression profoundly different from those developed by societies based on technology and written communication. Traditional art forms from the Arctic and North-West Coast, Melanesia, Polynesia, and West Africa will be considered along with ephemeral constructions, ritual arts, body decoration, and architecture. By examining the arts, symbolism, and myths of nonliterate societies, alternative models emerge both for the formal language of the work of art and for its broader social functions — models which can throw a surprising light on artistic practices and ideologies of Western culture.

#### 14. Nineteenth and Twentieth-Century Art (4)

In Europe of the later eighteenth century, the cultural and political upheavals of the American, French, and early Industrial Revolutions provoked such artists as Goya, Blake, and David to produce daring works which broke with academic painting. From then on, the world and the arts changed rapidly, and along with them the nature of the art audience and art market: a new middle-class art public emerged as did the new structures of museums, galleries, and criticism. Neoclassicism, romanticism, realism, impressionism, and post-impressionism — represented by such artists as Ingres, Delacroix, Courbet, Bonheur, Monet, Degas, Cassatt, Gauguin, Van Gogh, Rodin, and Cezanne — developed under these new economic, political, and artistic circumstances. During the twentieth century, bold experiments with new techniques of representation such as fauvism (Matisse) and cubism (Picasso, Braque), with abstraction (Kandinsky, Taeluber-Arp, Mondrian, Malevich) and in dada and surrealism (Duchamp, Miro, Kahlo) with the energies of the irrational and the unconscious succeeded and interacted upon one another, posing new questions about the nature of art and the role of the artist in society. Architectural practice and theory was transformed by the coming of the international style and the teachings of the Bauhaus. The course will end with a study of art since World War II, including American abstract expressionism (Pollock, de Kooning, Krasner), the subsequent international movements of pop, minimal, conceptual and performance art, and the recent questioning of the established history and institutions of art by the Third World and women's art movements.

#### 60. Introduction to Photography (4)

An in-depth exploration of the camera, combining darkroom techniques in black and white. Emphasis is placed on developing reliable control of the fundamental materials and procedures through lectures, field, and lab experience. Basic discussion of image making included. Materials fee required.

#### 70. Introduction to Media (4)

As the first part to a two-part course sequence, this course provides a technical foundation and theoretical context for all production-oriented film and video studies. The basic applicable scientific principles of light, optics, and electricity, as well as the evolution of media technology and theory will be covered. Conceptualization/preproduction strategies will be emphasized during laboratory periods and specific group exercises will be performed with 1/2" and 3/4" video equipment to gain a basic grasp of the techniques and to impart adequate levels of control. Completion of 70 is necessary to obtain a media card. Materials fee required.

#### 71. Introduction to Media (4)

As the second part to a two-part course sequence, this course extends the previously discussed topics, and sophisticating the students' understanding, emphasizes idea development and the analysis of the creative processes. The general principles of film and electronic media as language systems, the notion of a critical attitude, and the social effect/function of media will be covered, both in its current status and its potential for the future. Film and video will be contrasted and compared as technologies and information systems. Various examples of both media will be shown in class to illustrate documentary, narrative, and genre traditions. An extension of the conceptualization/preproduction strategies and development of postproduction/editing strategies will be directly applied to the students' work in Super 8 and 3/4" video. Small student groups will produce short, well thought-out projects. Materials fee required. Prerequisite: VA 70.



**84. History of Film (4)**

A survey of the history and the art of the cinema. The course will stress the origins of cinema and the contributions of the earliest filmmakers, including those of Europe, Russia, and the United States. Materials fee required.

## Upper Division

**104A. Performance (4)**

A workshop for artists to extend their art-making possibilities through use of their own bodies as both physical and psychological material and its potential for interaction with other human and nonhuman materials. Includes study of contemporary artists already working in this area. *Prerequisites:* VA 1, 2, 3 and either 14 or 111.

**104B. Audience-Oriented Performance (4)**

A continuation of techniques and viewpoints developed in Visual Arts 104A but with an emphasis on performing for audiences. Autobiographical (solo) and social (group) performance, narrative performance, objects and spaces that perform, games and entertainments, rituals and transcendental performance are among the topics that may be covered. *Prerequisite:* VA 104A or consent of instructor.

**104C. Performance of Everyday Life (4)**

This course deals with that branch of performance art which is not based on traditional theatrical elements, but attempts to interact with everyday life. It explores activities carried out without audiences in the everyday world rather than in a staging area, gallery, or art studio. May be repeated once for credit. *Prerequisite:* VA 104A or consent of instructor.

**105A. Beginning Drawing (4)**

A course in beginning drawing covering line, value, texture, gestures, forms, and composition. These concepts will be introduced by the use of models, still life, and landscapes. The different media that will be used include charcoal, pencil, ink, and conte. *Prerequisites:* VA 1, 2, 3 and either 14 or 111.

**105B. Intermediate Drawing (4)**

A continuation of Visual Arts 105A. The student will be exposed to a wider variety of means in representation. The connotational range of different sorts of "marks" and represented "spaces" will be explored. *Prerequisite:* VA 105A or consent of instructor.

**105C. Advanced Drawing (4)**

For advanced students. Students will be given the opportunity to explore the relation between their own energy and idiosyncrasy as draftsmen-artists and the quasi-objective demands of representing various types of real and virtual space. May be repeated once for credit. *Prerequisites:* VA 105A and one additional upper-division drawing course or consent of instructor.

**105D. Life Drawing (4)**

Using both nude and clothed models, the course explores the body as a human language that can be read and depicted from study of the body's stance, gesture, intention, and style. *Prerequisites:* two upper-division drawing courses, or consent of instructor.

**105E. Animal Drawing (4)**

A studio course which develops visual knowledge of and skill in capturing the form, movement, and texture of birds, animals, and fish. Special emphasis will be placed on understanding the environment of the animals and their behavior in that environment. The class will meet alternately on campus, at the zoo, the Museum of Natural History, Scripps Aquarium, and local farms. Students will be expected to carry out given assignments as well as initiate their own projects. May be repeated for credit. *Prerequisite:* VA 105A or consent of instructor.

**105F. Calligraphic Drawing (4)**

This is a studio course exploring for contemporary purposes such verbal-visual art forms as Japanese calligraphy and the figurative drawing which grows out of it, Persian manuscripts, surrealist concrete poetry, and American cartoons which operate equally through text and image. *Prerequisite:* VA 105A or consent of instructor.

**106A. Beginning Painting (4)**

A studio course focusing on the problems involved in transferring information and ideas onto a two-dimensional surface. Specific assignments to be determined by the professor. *Prerequisites:* VA 1, 2, 3 and either 14 or 111.

**106B. Intermediate Painting (4)**

A studio course in painting, stressing individual creative problems. Specific problems to be investigated will be determined by the individual professors. May be repeated once for credit. *Prerequisite:* VA 106A or consent of instructor.

**106C. Advanced Painting (4)**

A studio course in painting, stressing individual creative problems. May be repeated once for credit. *Prerequisites:* VA 106A and one additional upper-division painting course or consent of instructor.

**106D. Beginning Representational Painting (4)**

This is a studio course which aims to examine the options open to a painter who wishes to work with pictorial subject matter. Participants will be asked to analyze their artistic directions with respect to format, drawing, subject, and execution. Instruction will be given in all these areas. Students will be expected to research assigned artists and art forms. May be repeated once for credit. *Prerequisite:* VA 106A or consent of instructor.

**106E. Intermediate Representational Painting (4)**

A continuation of Visual Arts 106D on the intermediate level. May be repeated once for credit. *Prerequisite:* VA 106D.

**107A, B, C, D, E, F, G, H, I, J. Sculpture****A—Beginning Sculpture (4)**

A studio course focusing on the problems involved in transferring information into three-dimensional objects. Specific problems to be investigated will be determined by individual professors. *Prerequisites:* VA 1, 2, 3 and either 14 or 111.

**B—Intermediate Sculpture (4)**

An intermediate studio course in sculpture, stressing individual problems. Specific problems to be investigated will be determined by individual professors. May be repeated once for credit. *Prerequisite:* VA 107A or consent of instructor.

**C—The Decorative Object and the Decorative Environment (4)**

This course will focus on the decorative object, tableau, and the decorative environment. Students will explore formal sculptural issues as applied to the concept of decoration in a series of studio problems. Class discussion will include some of the historical and cultural issues surrounding decoration. Materials will include: found objects, furniture, cardboard, paints, cloths, etc. May be repeated once for credit. *Prerequisite:* VA 107A or consent of instructor.

**D—Representational Sculpture (4)**

Representational Sculpture will work with the model, found objects, photography, and drawing. Discussion and slides will be used to examine the history and theories of representation. Practice will address problems of narration. May be repeated once for credit. *Prerequisite:* VA 107A or consent of instructor.

**E—Art in the Landscape (4)**

A studio course exploring any kind of sculpture that can be placed in the landscape, ranging from micro and actual objects to monumental installations, and including, trails, meditation spaces, shelters, micro and macro parks and plazas — any kind of three-dimensional work claiming the external environment, natural or urban, as its context. *Prerequisite:* VA 107A or consent of instructor.

**F—Tableau (4)**

Tableau will focus on groupings, clusters, and arrays that have narrative content. The sculptural issues of space, scale, and color will be addressed. Class discussion will refer to the function of tableau in diverse art forms. These include not only sculpture but painting, theater, film, and performance. Materials will include found objects as well as those specifically manufactured from cardboard, wood, canvas, and other simple materials. May be repeated once for credit. *Prerequisite:* VA 107A or consent of instructor.

**G—Earthworks to Ecological Art (4)****Sculpture and the Natural Environment**

This course will focus on the use of the earth as grounds for art-making. An assessment of recent art in this area as well as underlying historical and cultural attitudes toward siting and the earth will form part of the class discussion. Projects will include sketches, photographs, drawings, proposals, and models. A final project may re-

quire works on sites available in university environs. May be repeated once for credit. *Prerequisite:* VA 107A or consent of instructor.

**H—The Object as Sculpture (4)**

This class consists of creating three-dimensional objects by a variety of basic techniques such as building negative molds out of cardboard from which a positive object is cast in molding plaster. We will also use wood, cardboard, and "found" materials/objects to explore a basic attitude toward sculpture. Besides the studio work, there will be lectures and slides with emphasis on contemporary work. May be repeated once for credit. *Prerequisite:* VA 107A or consent of instructor.

**I—Environment as Painting/Installation as Painting (4)**

The practice of painting as a generator of environmental space in transaction with architecture. The course deals with problems peculiar to sculptural implications of painting. Reference will be made to precedents in the mural programs of the past as well as to contemporary installations. Scale models of existing hypothetical architectural space and graphic aids such as drawing, photography, and collage may be utilized. May be repeated once for credit. *Prerequisite:* VA 106A, VA 107A, or consent of instructor.

**J—Materials and Construction Sculpture (4)**

An intermediate course exploring the sculptural meanings obtainable through the choice of various types of materials and their combinations; and through various modes of joining, assembly, and ordering. May be repeated once for credit. *Prerequisite:* VA 107A or consent of instructor.

**108. Advanced Projects in Art (4)**

A studio course for serious art students at the advanced level. Stress will be placed on individual creative problems. Specific orientation of this course will vary with the instructor. Topics may include film, video, photography, painting, performance, etc. May be repeated for credit once. *Prerequisite:* consent of instructor.

**109. Advanced Projects in Media (4)**

A production course for serious upper-division media students. Individual or group projects will be completed over one or two quarters. A specific project organized by the student(s) will be realized during this course, with the instructor acting as a close adviser and critic. Formal concept papers or scripts must be completed and approved by the instructor prior to enrollment. May be repeated twice for credit. *Prerequisite:* consent of instructor.

**110. Artists' Books (4)**

This studio course, in which artists make and talk about books, is open to persons with backgrounds in painting, photography, sculpture, conceptual art, etc. Genre studies will include comic books, journals, morality tales, manifestos, etc. May be repeated once for credit. *Prerequisites:* two upper-division courses in area, or consent of instructor.

**111. The Structure of Art (4)**

This course will address the structure of signification in art. We will consider the modes of signification in a wide range of representational and nonrepresentational artworks from architecture through drawing, painting, sculpture, photography, video, and film to performance. Examples will be selected from various places and epochs. This course is required for transfer students.

**112. Art Historical Methods (4)**

A critical review of the principal strategies of investigation in past and present art-historical practice, a scrutiny of their contexts and underlying assumptions, and a look at alternative possibilities. The various traditions for formal and iconographic analysis as well as the categories of historical description will be studied. Required for all art history and criticism majors. *Prerequisite:* one upper-division art history and criticism course; two recommended.

**113A. History of Criticism I: Classical through Renaissance (4)**

This course will emphasize the origins of Western art critical thought with readings in the philosophical literature of antiquity. The theories of representation, of beauty, and of expressivity will be examined in the works of Plato and Aristotle. The theory of style will be studied in the rhetorical writings of Aristotle, Plutarch, Longinus, in Vitruvius' work on architecture and in Pliny's chapters on the history of art. Attention will be given to Augustine and the Church Fathers. Writings of

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the Middle Ages will be illustrated by readings in Villard de Honnecourt, in Theophilus Presbyter, and in Cennino Cennini. Some attention may be paid to writings by Ghiberti, Alberti, and Aretino. *Prerequisite: none; courses in art history and criticism recommended.*

### 113B. History of Criticism II: The Enlightenment and The Early Modern Age (4)

After a brief survey of selected seventeenth- and eighteenth-century texts, consisting mainly of the writings of connoisseurs, the course will concentrate on the newly emergent philosophical and art critical discourse in France, Germany, and England, with readings in such philosophical works as Kant's *Critique of Judgment*, Hegel's *Aesthetics*, Kirkegaard's *Either/Or*, and Nietzsche's *Birth of Tragedy*. Art critical writings will include selections from Diderot, Winckelmann, Reynolds, Stendhal, Baudelaire, Champfleury, Mallarmé, Ruskin, Morris, Wilde, and Pater. Writings of various artists from Delacroix to Whistler and Van Gogh will also be considered. *Prerequisite: none; courses in art history and criticism recommended.*

### 113C. History of Criticism III: The Twentieth Century (4)

This course will analyze the multiple currents of twentieth-century art critical discourse. Philosophical writers such as Croce, Dewey, Heidegger, Wittgenstein, and Cavell, Marxist critics such as Marx, Engels, Trotsky, Benjamin, Lukacs and Brecht, and French structuralist writers such as Barthes, Derrida, and Foucault may be considered. *Prerequisite: none; courses in art history and criticism recommended.*

### 113D. History of Criticism IV: Contemporary Criticism (4)

A course in post-World War II criticism, primarily American. The early writings of Rosenberg and Greenberg on abstract expressionism will constitute the beginning course readings, followed by Greenberg's later, widely influential writings of the 1960s. Other points of view by such writers as Lippard, Burnham, Kozloff, and Krauss may be studied as well as the critical writings of artists such as Newman, Reinhardt, Judd, Smithson, and Morris. Influential magazines and journals may be examined. *Prerequisite: none; courses in art history and criticism recommended.*

### 114. Art Criticism (4)

This course is intended to develop critical approaches to contemporary art. It will investigate contemporary forms of art criticism, stressing both traditional and alternate points of view. Outside field trips and critical writings will be assigned. May be repeated once for credit. *Prerequisite: consent of instructor.*

### 115. Semiotics (4)

This course is an examination of modes of signification in the arts and the possible structure of these modes. Reference will be made to linguistic, communicational, and game models. Writings of the Prague School, the French tradition, and some of the English and American language philosophers will be considered, and an attempt will be made to develop particular models more suited to the arts than those previously worked out. *Prerequisite: consent of instructor.*

### 117. Narrative Structures in the Visual Arts (4)

How can a fixed image represent events in time? The strategies of story telling and their consequences for the meaning of works of art will be investigated. Content of the course will vary: Ancient, Medieval, Renaissance, Baroque, or Modern Art may be emphasized. May be repeated with permission of the instructor. *Prerequisites: Art Historical Methods (VA 112) or two upper-division courses in art history and criticism or consent of instructor.*

### 120A. Greek Art (4)

Greek classical civilization was a turning point in the history of humanity. Within a new kind of society, the idea of the individual as free and responsible was forged, and with it the invention of history, philosophy, tragedy, and science. The arts which expressed this cultural explosion were no less revolutionary. The achievements of Greek art in architecture, sculpture, and painting will be examined from their beginnings in the archaic period, to their epoch-making fulfillment in the classical decades of the fifth century B.C., to their diffusion over the entire ancient world in the age of Alexander and his successors. *Prerequisites: none; Western Art I (VA 11) recommended.*

### 120B. Roman Art (4)

Roman art was the "modern art" of antiquity. Out of their Italic tradition and the great inheritance of Greek classic and Hellenistic art, the Romans forged a new language of form to

meet the needs of a vast empire, a complex and tumultuous society, and a sophisticated, intellectually diverse culture. An unprecedented architecture of shaped space used new materials and revolutionary engineering techniques in boldly functional ways for purposes of psychological control and symbolic assertion. Sculpture in the round and in relief was pictorialized to gain spatial effects and immediacy of presence, and an extraordinary art of portraiture investigated the psychology while asserting the status claims of the individual. Extreme shifts of style, from the classicism of the age of Augustus to the expressionism of the third century A.D., are characteristic of this period. The new modes of architecture, sculpture, and painting, whether in the service of the rhetoric of state power or of the individual quest for meaning, were passed on to the medieval and ultimately to the modern West. *Prerequisite: none; Western Art I (VA 11) recommended.*

### 120C. Late Antique Art (4)

During the later centuries of the Roman Empire, the ancient world underwent a profound crisis. Beset by barbarian invasions, torn by internal conflict and drastic social change, inflamed with religious passion which was to lead to a transformed vision of the individual, the world, and the divine, this momentous age saw the conversion of the Roman world to Christianity, the transfer of power from Rome to Constantinople, and the creation of a new society and culture. Out of this ferment, during the centuries from Constantine to Justinian, there emerged new art forms fit to represent the new vision of an otherworldly reality: a vaulted architecture of diaphanous space, a new art of mosaic which dissolved surfaces in light, a figural language both abstractly symbolic and urgently expressive. The great creative epoch transformed the heritage of classical Greco-Roman art and laid the foundations of the art of the Christian West and Moslem East for the next thousand years. *Prerequisite: none; Western Art I (VA 11) or Roman Art (VA 120B) recommended.*

### 121A. Prehistoric Art (4)

Tens of thousands of years before the dawn of history, the hunting peoples of Ice Age Europe invented the first language of visual images of which all later societies are the inheritors. This figurative tradition — whose greatest monuments are the painted cave sanctuaries of France and Spain, such as the famed Lascaux and Altamira — still dazzles us with its unsurpassed vitality of artistic expression and mystifies us with the unanswered questions of its meaning. This course will offer an overview of the range and scope of Palaeolithic artistic production over its 20,000-year span, against the background of what is known about contemporary conditions of nature, society, and human life. It will present a critical review of the various modern interpretations of the function and meaning of Palaeolithic art, especially the theories of A. Leroi-Gourhan. It will conclude with a look at the perpetuation and transformation of Palaeolithic art and its world-view in the new Neolithic cultures — based on agriculture and settled town life — which arose in the Mediterranean and Near East at the close of the Ice Age, and which are the direct ancestors of our own urban and technological society. *Prerequisite: none; Western Art I (VA 11) recommended.*

### 121B. Greek Painting (4)

Painting is the most fragile of the arts and that of which the fewest traces have survived from the wreck of antiquity. Nevertheless, we know from literary sources, from what is preserved in the more durable medium of fired vase decoration, and from scattered remains (augmented by a number of spectacular recent discoveries of large-scale monumental painting) that painting was one of the foremost among the arts in ancient Greece. It seems to have taken a predominant role in the great intellectual revolution which produced high classic art and which altered the shape of Western and world art forever after. This course will review what is known about Greek painting, from its beginnings in the abstract decoration of the geometric period, focusing on the achievements of the classical breakthrough — witnessed in such devices as spatial perspective and the rendering of volume by *chiaroscuro* — and their diffusion throughout the contemporary and later Mediterranean world. *Prerequisite: Western Art I (VA 11); Greek Art (VA 120A) recommended.*

### 122A. Art of the Middle Ages (4)

This course offers a survey of art produced in Western Europe from 650 A.D. until the end of the fourteenth century. Special attention is given to the self-conscious use of classical models in the art of the Lombards, Charlemagne, and the Saxon kings, to the recovery of monumentality in Romanesque art, and to the development and spread of the Gothic style as the first unified and universal visual language to replace that of classical antiquity. *Prerequisite: none; Western Art I (VA 11) or Western Art II (VA 12) recommended.*

### 122B. Renaissance Art (4)

In the fifteenth century, artistic developments in Italy and Northern Europe followed parallel and, at times, interpenetrating courses. Artists in both regions sought to renew the visual languages they had inherited from the Middle Ages by bringing them into closer conformity with the laws of vision and of nature. As a result, artists like Donatello and Mantegna in Italy and Jan van Eyck and Rogier van der Weyden in Flanders produced works which presented timeless religious truths in the guise of temporal occurrences. Sustained by the achievements of their predecessors and nourished by the remains of Roman antiquity, Leonardo da Vinci, Michelangelo, Raphael, and Titian created a style that expressed with extraordinary power and directness the meaning of their humanist religion. For the rest of the sixteenth century, artists such as Durer and Holbein, Veronese and El Greco mastered, used, and refined the visual language these earlier geniuses had created. *Prerequisite: none; Western Art II (VA 12) recommended.*

### 122C. Baroque Art (4)

The baroque style was created in Rome around 1600 and quickly spread throughout Italy and to the other countries of Europe. A period of increasing intellectual specialization, of the entrenchment of modern national boundaries, of the co-existence of rival religious organizations, of the formation of artistic academies, and of the flourishing of a middle class which provided patronage for the arts, the baroque period afforded individual artists a wide range of stylistic and expressive possibilities. By focusing on the major works of Caravaggio, Bernini, Borromini, Rubens, Rembrandt, and Vermeer, this course stresses the different ways each artist used the visual language inherited from the Renaissance. *Prerequisite: none; Western Art II (VA 12) recommended.*

### 123A. Italian Art of the Early Renaissance (4)

Spurred by a renewed interest in the natural world and in the classical past, a coterie of artists in contact with Brunelleschi and Donatello in Florence brought about a revival of the arts that spread throughout Italy. Freed from the medieval role of the artist as craftsman, Alberti, Piero della Francesca, Mantegna, Botticelli, and others produced works which embodied the highest values and intellectual achievements of the age. This course examines painting, sculpture, architecture, urban design, and art theory in a world of humanistic learning, of profound belief in God, and of faith in the inherent capacities of humanity, as an expression of the religious, philosophical, social, and political ideals of fifteenth-century Italy. *Prerequisite: none; Western Art II (VA 12) or Renaissance Art (VA 122B) recommended.*

### 123B. High Renaissance Art (4)

Ever since the sixteenth century, the names of Leonardo da Vinci, Bramante, Michelangelo, Raphael, and Titian have conjured up images of the highest artistic achievement. In this course, we will assess the qualities that made their art great by focusing on individual works such as the *Last Supper* and *Mona Lisa*, the *Tempietto* and *Church of St. Peter*, the *David* and the frescoes of the Sistine Chapel, the *School of Athens* and *Transfiguration*, the *Venus of Urbino* and *Sacred and Profane Love*. Particular emphasis will be given to the situations for which the works were produced, their religious and philosophical content, and their relation to contemporary art theory. *Prerequisite: none; Western Art II (VA 12) or Renaissance Art (VA 122B) recommended.*

### 123C. Michelangelo (4)

This course offers new approaches to understanding Michelangelo's greatest creations. By considering how each work relates to the setting for which it was intended, by regarding critical literature and artistic borrowings as evidence about the works, and by studying the thought of the spiritual reformers who counseled Michelangelo, new interpretations emerge which show the artist to be a deeply religious man who invested his works with both public and private meanings. *Prerequisite: one upper-division course in Renaissance art; Art Historical Methods (VA 112) or High Renaissance Art (VA 123B) recommended.*

### 123D. The City in Italy (4)

Each of the great Italian cities has a style and heritage all its own. This course considers the social, political, economic, and religious aspects of civic life which gave rise to the unique characteristics of such cities as Florence, Siena, Venice, or Rome. Emphasis will be placed on the function and content of civic art, the architecture of public buildings, and the design of the urban environment. The specific content of the course, the city or cities and periods under consideration will vary. *Prerequisite: none; Art Historical Methods (VA 112) recommended.*

**124A. The Art of the Eighteenth Century (4)**

From Watteau to Goya, eighteenth-century artists turned to the past, especially to medieval Europe and to the antique and looked at the present for inspiration, imagery and style. Piranesi explored the antique ruins of Italy, Walpole studied the medieval architecture of England, and Hogarth the society of contemporary London, while in France, David delved into both antique and current historical events. Out of these studies came Piranesi's *Views of Rome*, Walpole's Gothic fantasy home of Strawberry Hill, Hogarth's *Rake's Progress*, and David's *Oath of the Horatii* and *Marat Assassinated*. In America, Jefferson and Stuart struggled with how to portray the new Republic in stone and paint. The American and French Revolutions and the rise of industrialization greatly affected European artists and art movements of the later eighteenth century. *Prerequisite: none; Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**124B. The Art of the Nineteenth Century (4)**

Napoleonic and post-Waterloo Europe witnessed the expansion and transformation of the previous century's neo-classical and romantic movements. These styles, closely intermeshed and chronologically overlapping, were challenged by the emergence of the realist movement in the 1840s. With the rise of the salons, museums, and galleries and of art criticism, the middle class took on a new interest in art. They joined with the upper classes to study, admire, mock and/or ignore the work of Gericault, Ingres, Delacroix, Courbet, Bonheur, and Manet in France; Constable, Turner and the Pre-Raphaelites in England; Friedrich in Germany; and Cole, Church, and Homer in America. By the end of the century, artists had to contend not only with photography as an alternative mode of visual representation, but also with the growing severance between the public and the avant-garde. Artists such as Degas, Monet, Cassatt, Seurat, Cezanne, Van Gogh, Gauguin, and Munch no longer had guaranteed access to exhibition space, critical approval, or public support. Brilliant and fascinating as was the art of the late nineteenth century, the price for making it, socially, psychologically and economically, was a high one for the artist. *Prerequisite: none; Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**124C. The Art of the Twentieth Century (4)**

In the first decade of the new century, Picasso's *Les Femmes d'Alger* and Matisse's *Joy of Life* shook Paris, a city soon to be dominated by the cubist movement; while in the New York of Stieglitz and O'Keeffe, the Parisian Duchamp came to seek his artistic fortune. In Italy, de Chirico and the boisterous futurists challenged accepted artistic standards, as did Nolde, Kirchner, and Kollwitz in Germany. Visionary abstraction was explored by Kandinsky in Munich, Mondrian in Holland, Taauber-Arp in Switzerland and France, and Malevich in Russia, where other artists also became involved in the visual expression and promotion of the 1917 Russian Revolution. New architectural styles and approaches were developed by Corbusier, Wright, and the German Bauhaus architects. In the 1920s, cubist Paris became a surrealist center — visited by Ernst, Miro, Magritte, and Dali, among others. Many avant-garde European artists took refuge in New York during World War II. The highly original New York School of the 1940s and 1950s, often called Abstract Expressionism, responded deeply to these European presences as well as to its own New World cultural heritage. *Prerequisite: none; Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**125A. Issues and Trends in American Art (4)**

American art was created through the confluence of European high and folk art traditions transplanted to a new continent. While long dependent upon the traditional overseas centers of culture, artists in the New World were permitted and obliged by their relative isolation, and by the challenge of profoundly different social and natural conditions, to develop original perspectives and to invent new formal devices in which to express them. The greatest achievements of American art in the nineteenth century were landscape painting (Church and Cole) which expressed the immensity of the new continent, and the bold architecture which attempted to control it (Sullivan and the Chicago School). In the twentieth century, American art finally shed its provincial status (Armory Show) and entered into a dialogue with the major European modern art movements. First in architecture (Wright), and only decades later in painting and sculpture (Abstract Expressionism), its influence radiated abroad. *Prerequisite: none; Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**125B. Modernist European Painting, 1876-1914 (4)**

An intensive examination of the emergence and development of modernist tendencies in European painting, with particular attention to the work of late nineteenth-century artists such as: Monet, Manet, Renoir, Cezanne, Seurat, Van Gogh, Toulouse-Lautrec, Munch, Gauguin, Degas, and others, and, in the first decade of the twentieth century, the work of Picasso, Matisse, Duchamp, Kandinsky, and the schools of German Expressionists and the Italian Futurists. *Prerequisite: none; Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**125C. Matisse and Picasso (4)**

A study of two major artists of the early twentieth century: Matisse and Picasso. Matisse, the "conservative" modern, and Picasso, the "radical" modern. Particular emphasis will be placed on the sources and effects of their respective innovations within their contemporary context. *Prerequisite: Western Art II (VA 12) or Nineteenth- and Twentieth-Century Art (VA 14).*

**125D. Contemporary Art (4)**

After World War II, the relationship between America and Europe changed radically in the arena of both politics and art. American economic power supported the rise in prestige and fame of American art; witness the international success of the abstract expressionists Pollock and De Kooning. The course will examine the currents, complementary and contradictory, in American art since 1950; the ambiguous art of Johns, the chance inventions of Cage, the celebration, albeit often ironic, of popular culture and attitudes in Warhol, Marisol, and Oldenburg, the ambitions and restraints of minimalism, and the explosive, troubled art scene of the late 1960s. That time saw not only the emergence of art and technology, conceptual/process art, earthworks, and early performance/body art but also the artistic visions and painted, sculpted, and performed protests of the Third World and women's movements. The course will end with an examination of art of the 1970s — pattern and decoration, new image, etc. — and will finish with a look at the current reshifting of artistic power between Europe and America. *Prerequisite: none; Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**125E. History of Performance Art (4)**

The novel, perplexing, outrageous, and witty modes of performance by such contemporary artists as Acconci, Anderson, Antin, Beuys, Jonas, Kaprow, and Lacy will be examined in the critical framework of earlier twentieth-century experiments in music, theater, and dance as well as in the visual arts. The movements of futurism, dada and surrealism, the Russian avant-garde, the Bauhaus, abstract expressionism, and happenings provide antecedents for performance art. So do the fields of anthropology, sociology, and psychology as well as the theater practices and theories of Artaud, Brecht, Piscator, Meyerhold, and Stanislavsky, and the experimental dance of Duncan, Wigman, Laban, Graham, Cunningham, and Rainer. *Prerequisite: none.*

**125F. History of Twentieth-Century Sculpture (4)**

Sculpture reemerged as a major art form in the twentieth century. Beginning with the playful experiments of Picasso, the Readymades of Duchamp and the primordial purism of Brancusi, the notion of sculpture has been subjected to a continuous set of transformations. By the early 1920s, many new possibilities opened up: the comical constructions of the dadaists, the dream constructions of the surrealists, the utopian fantasies of the Russians, and the functional aspirations of the Bauhaus designers. Political developments in Eastern and Western Europe led to an ideological and fashion-driven resurgence of neo-representational sculpture in German and Italian fascist works and to applied art deco styles in America and France. At the end of the Second World War, the energies of sculpture were liberated once again to produce abstract expressionist and neo-dada sculpture: the work of David Smith, Jasper Johns, and Louise Nevelson. Styles and genres proliferated wildly in the late 1960s and early 1970s as sculptors drew upon a wide range of artistic and craft precedents. These new styles included minimal, site-specific and earthwork modes, and a variety of systems art bearing on technological, psychological, social, ecological, and political concerns. *Prerequisite: none; Nineteenth- and Twentieth-Century Art (VA 14) recommended.*

**125G. American Folk Art (4)**

This course will examine American folk arts which draw their strength from an amalgam of indigenous traditions and the personal vision of the artists. Limners, Shakers, the Santos of New Mexico, Afro-American folk artists, and quilt-makers will

be discussed, as well as the role women play in the tradition of folk art. Independent research will be required. *Prerequisite: none; Art Historical Methods (VA 112) recommended.*

**126A. African and Afro-American Art (4)**

The dynamic, expressive arts of selected West African societies and their subsequent survival and transformation in the New World will be studied. Emphasis will be placed on Afro-American modes of art and ceremony in the United States, Haiti, Brazil, and Suriname. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**126B. Polynesian Art (4)**

The arts, dance, and myths of Polynesia evoke romantic visions, perhaps because it was one of the last areas on earth to be inhabited, as well as being the last major culture to be rediscovered by the West. The course will study the aristocratic art systems that once flourished in the Society, Marquesas, and Hawaiian Islands. The "mysteries" of Easter Island will be discussed along with the continuing tradition of the tapa-process in Tonga, Samoa, and Fiji. The role of the Maori artist as *Tohunga*, the symbolic council houses and the significance of tattooing will also be given special attention. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**126C. Melanesian Art (4)**

This course will analyze the role of "Big Man"/artist in this splendidly rich and diverse region of the world. The relationship of art to ritual acts, myth, and dance will be explored in select areas of New Guinea (i.e., the Abelam, Arapesh, Iatmul people) and West Irian (the Asmat). The study of the art systems unique to New Ireland, the New Hebrides, the Solomons, and Australia will further our understanding of artistic practices and symbolic models. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**126D. Art of the Southwest American Indians (4)**

The American Southwest is a culturally diverse area with a rich and varied artistic continuum. The Hopi, Navajo, Zuni, and Pueblo Indians all have their own ceremonies, art, and architecture. The course will explore the ancient pueblos of Chaco Canyon and Mesa Verde's "cliff houses," analyze the kachinas and shalako, and examine the famous weaving and pottery-making traditions of the present. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**127A. Architecture, Myth, and Power (4)**

The extraordinary architectural structures of non-Western societies will be studied in relation to a gamut of activities concerning the comprehension and transformation of space and their symbolic and cosmic interpretations within the society presented. Emphasis will be placed on architectural forms found in West Africa, Melanesia, Polynesia, Suriname, and the American Southwest. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**127B. Western and Non-Western Rituals and Ceremonies (4)**

This course will examine the process of image making within specific ceremonies and/or rituals. Selected ceremonies from West Africa, Melanesia, Nepal and the United States, including both Christian and non-Christian imagery, will be considered. Performance art and masquerade will be analyzed within a non-Western framework. *Prerequisite: none; Non-Western Art (VA 13) recommended.*

**127C. Female Artists and Female Imagery (4)**

This course will analyze the equivocal role of women as artists in selected non-Western societies with a look at parallel phenomena in the West. It will also examine, within given cultural contexts, the significance of female imagery: what type of female images predominate (e.g., mother/child, splayed female, etc.) and who are the patrons and/or consumers of these images. *Prerequisite: one upper-division art history course; two recommended.*

**127D. Primitivism and Exoticism in Modern Art (4)**

At the turn of the century, the arts of Africa, Asia, and Oceania had a strong impact on modern art. European artists learned new formal and expressive devices, ways of animating the surfaces of sculpture and painting, of using volume free from the precision of classical proportions, and of evoking space without the single viewpoint. At the same time, their views of art and of themselves were shaped by a fervent — if misunderstood — image of exotic forms of life closer to nature and free of the stifling constraints of bourgeois society. Gauguin, the cubists, the German expressionists, the surrealists, and later artists as well responded deeply to the stimulus of these exotic cultures and their arts. *Prerequisite: none; non-Western Art (VA 13) recommended.*



## VISUAL ARTS

### 128A-E. Topics in Art History and Criticism

These lecture courses treat styles, movements, themes, and theories of art which are touched on only briefly in general survey courses but are not treated in our regularly scheduled upper-division lecture courses. As the courses under this heading will be offered less frequently than those of the regular curriculum, students are urged to check for availability and descriptions of these supplementary courses in the annual catalog listings. Like the courses listed under VA 129 below, the letters following the course number designate the general area in which the courses fall. Students may take courses with the same number but of different content more than once for credit, with consent of instructor and/or program adviser. *Prerequisite: none; courses in art history and criticism recommended*

### 128A. Topics in Art Criticism and Theory (4)

This course will treat topics such as: Art Theory in the Renaissance; Representation: The Realist Strategy; Views of Nature: Landscape Painting to Earthworks.

### 128B. Topics in Ancient Art (4)

This course will treat topics such as: High Classic Art, Hellenistic Art, Architecture of Ancient Rome and Its Empire.

### 128C. Topics in Medieval, Renaissance, and Baroque Art (4)

This course will treat topics such as: Romanesque Art, The Rise of the Gothic Style, Northern Renaissance Art, Baroque Architecture, Seventeenth-Century Painting in Spain and the Low Countries.

### 128D. Topics in Modern Art (4)

This course will treat topics such as Neoclassicism and Romanticism; Impressionism and Post-Impressionism; Cubism; Dada and Surrealism; Abstract Expressionism.

### 128E. Topics in Non-Western Art (4)

This course will explore such themes as: The impact of Polynesian art and society on the works of Paul Gauguin; art forms (i.e., tattooing, architecture, masks) as visual manifestations of social relationships; the enigmatic use of punning in the visual arts.

### 129A-E. Special Problems in Art History and Criticism

These seminar courses provide the opportunity for in-depth study of a particular work, artist, subject, period, or issue. Courses offered under this heading may reflect the current research interests of the instructor or treat a controversial theme in the field of art history and criticism. Active student research and classroom participation are expected. Enrollment is limited, and preference will be given to majors. The letters (A, B, C, D, or E) following 129 in the course number designate the particular area of art history or criticism concerned. Students may take courses with the same number but of different content more than once for credit, with consent of the instructor and/or the program adviser. *Prerequisite: Art Historical Methods (VA 112) or two upper-division courses in art history and criticism.*

### 129A. Special Problems in Art Criticism and Theory (4)

Specialized aspects of the theory and criticism of art will be examined in a changing series of courses designed for intensive student participation. Topics currently foreseen will include: Object and Image: A Structural Enquiry; Sources and Development of Formalist Criticism: The Eighteenth Century to the Present; Symbolist Ideology and Practice in the Arts; Problems in the Theory of Modernism.

### 129B. Special Problems in Ancient Art (4)

This course will investigate particular themes or areas of ancient art in greater depth than is possible in period surveys. Topics currently foreseen include: The Portrait in Antiquity; Aspects of Self and Society; Art and Ideology in Augustan Rome; Roman Historical Relief.

### 129C. Special Problems in Medieval, Renaissance, and Baroque Art (4)

This course will treat a particular artist or problem of interpretation in medieval, Renaissance, and baroque art. Issues of the style, function, meaning, sources, impact, practice, and theory of art are investigated by focusing on a given artist, group of artists, work or works, subject, or historical and critical approach. The topics currently foreseen include: Alberti, Mantegna, and Leonardo: The Theory and Practice of Renaissance Art; The Art of Andrea Mantegna; Nudity and Sexuality in Christian Art; The Classical Tradition and Its Transformations.

### 129D. Special Problems in Modern Art (4)

This course will study specialized historical periods and problems, and individual artists in the eighteenth, nineteenth, and twentieth centuries up to the present. The topics under consideration include: The Art of the Empires: Vienna and London in the Late Nineteenth Century; Art, Culture, and Politics in the Weimar Republic; The Crisis of the Later 1960s: New Movements and Re-directions in Art and Criticism; Marcel Duchamp; Twentieth-Century Environmental Painting; Twentieth-Century Women Artists.

### 129E. Special Problems in Non-Western Art (4)

This course allows students to pursue issues of meaning, interpretation, and methodology in relationship to specific non-Western societies. Topics under consideration include: Day of the Dead in Tijuana; Popular and Tourist Art in Tonga; Santos Tradition of Folk Art in New Mexico.

### 130. Special Projects in Visual Arts (4)

Specific content will vary each quarter. Areas will cover expertise of visiting faculty. May be repeated twice for credit. *Prerequisite: consent of instructor.*

### 131. Special Projects in Media (4)

Specific content will vary each quarter. Areas will cover expertise of visiting faculty. May be repeatable twice for credit. *Prerequisite: consent of instructor.*

### 150. History and Art of the Silent Cinema (4)

An intensive investigation into the form, history, and meaning of the silent cinema from its inception as a nineteenth-century optical toy to its fullest expression in the works of such masters as D.W. Griffith, Charlie Chaplin, Eisenstein, Vertov, Vigo and others, with particular emphasis on the interrelationships between film and the other visual arts of the period. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

### 151. History of the Experimental Film (4)

An inquiry into a specialized alternative history of film, consisting of experimental works made outside the conventions of the movie industry and which in their style and nature are closer to modernist painting, poetry, etc., than to the mainstream theatrical cinema. Works by such film artists as Man Ray, Salvador Dali, Maya Deren, Stan Brakhage, and Michael Snow will be examined in depth. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

### 152. Film in Social Context (4)

This collection of courses gathers, under one cover, films that are strongly marked by period, geography, and the culture within which they received their dominating local quality. These courses pay particular attention to the stamp of place — climate, dress, habitation, language, music, politics — as well as the filmic moves that helped color such works as environmental. The series takes in the following subjects: Third World films, the Munich films (the new wave of Germans who made their first features in Munich following 1967), Japanese movies, films of the American thirties and their relationship to current thought, American Westerns, ethnographic film, Brazil's Cinema Novo, etc. Specific topics to be covered will vary with the instructor. May be repeated twice for credit. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

### 153. The Genre Series (4)

A group of related courses exploring the conventions within such generic and mythic forms as the cowboy, shamus, chorus girls, and vampire films. May be repeated twice for credit. Materials fee required. *Prerequisite: none; VA 84 recommended.*

### 154. Hard Look at the Movies (4)

Examines a choice of films, selected along different lines of analysis, coherent within the particular premise of the course. Films are selected from different periods and genres among Hollywood, European, and Third World films. May be repeated once for credit. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

### 155. The Director Series (4)

A course that describes the experiences, looks, and structure of director-dominated films. A different director will be studied each quarter. The student will be required to attend the lecture in the course and to meet with the instructor at least once each week. May be repeated three times for credit. Materials fee required. *Prerequisite: VA 84 or consent of instructor.*

### 157. Video History and Criticism (4)

A lecture course that examines video as an art form, its relationship to the development from television and other art forms, and surveys current work in the medium. Students will develop a critical approach based on these relationships and explore this approach through short essays and a term paper. Topics include storytelling, performance and video, docu-art work, and video art on television. Materials fee required. *Prerequisites: VA 14, 84, and 111.*

### 158. Critical History of Twentieth-Century Photography (4)

The course will begin with a sketch of the early nineteenth-century background of the origins of photography and will articulate a number of the fundamental issues raised by it. It will then concentrate on the development of the medium from Stieglitz's Photo Secession to the present, emphasizing such critical issues as the factuality, truthfulness, or representation adequacy raised by the history of the genre, as well as its claims to art or craft status and the related questions of expressive capacity, relation to notions of taste, technical excellence, or stylistic significance. These will be studied in the context of the development of commercial and mass media uses of photography in the twentieth century. *Prerequisite: none.*

### 165. Camera Techniques (4)

An intermediate course involving refined control over different films, developers, papers, and other photographic techniques. Portfolio required for admission. Materials fee required. *Prerequisites: VA 60 and consent of instructor.*

### 166. Camera Techniques (4)

An advanced-level course involving new techniques and processes as well as refined control over different films, developers, papers, and other photographic materials. Portfolio required for admission. Materials fee required. *Prerequisites: VA 60, 165, 167, and consent of instructor.*

### 167. Photographic Strategies (4)

An introduction to the aesthetic problems in photography. Portfolio required for admission. Materials fee required. *Prerequisites: VA 60 and consent of instructor.*

### 168. Color Techniques in Photography (4)

Instruction in color photography and printing. Lectures on theory and demonstrations in shooting and printing color negatives. Portfolio required for admission. Materials fee required. *Prerequisites: VA 60, 165, 167 and consent of instructor.*

### 172. Studio Video (4)

A production course of video as a creative medium and the video studio as a production and post-production tool. Covers lighting, studio sound, the switcher and special effects, directing and editing in the controlled environment of the video studio. Assignments will be done collaboratively and/or individually and critiqued by the class and the instructor. Tapes by independent video artists will be shown and discussed in terms of technique and style. *Prerequisites: VA 60, 70, 71, 111, and 174.*

### 173. Field Video (4)

A production course emphasizing portable field video as a creative medium. Students will conceive, script, produce, direct, and edit short video assignments. This production and critique cycle is the basis of the course. Tapes by independent video artists will be shown and discussed. *Prerequisites: VA 60, 70, 71, 111, and 174.*

### 174. Media Sketchbook (4)

A first experience in formulating ideas and images for creative media production. Emphasis is upon original and inventive conceptualization and realization, as students perform in all aspects of video — planning, camera, performance, production — in their own works and crewing for each other. As the traditional artist uses his or her sketchbook to draw rapid, bold concretizations of ideas, this class encourages speed, clarity, originality, and taking chances. *Prerequisite: VA 1 or 2 or 3 or 4, 14, 60, 70, 71, 84.*

### 177. Scripting and Editing Strategies (4)

The aim of this course is to familiarize students with pre-production and post-production techniques (shooting script, storyboard, continuity notes, etc.), their relationship and their interdependence. Students will be given the task of developing at least three short narrative or documentary scripts (three minutes in length) from the writing stage to the shooting script and storyboard stage. They will be required further to shoot and edit one of these scripts and to present the in-

structor with organized notes taken during the editing process. Collaborative projects may be done. *Prerequisites:* VA 70, 71 and 174, and one production course (172, 173, or 186).

#### 178. Experimental Media (4)

A production course investigating a wide range of exploratory work in film, video, or photography. The course will concentrate on those works that fall outside the fixed genres of narrative and documentary or work on their boundaries. Several individual projects are required. May be repeated twice for credit. *Prerequisite:* one required but two recommended. VA 165, 167, 172, 173, 177, 186. VA 177 strongly recommended.

#### 179. Narrative Media (4)

A production course exploring narrative in film, video, or photography. Attention will be paid to the relations between "story" and narrative, to the difference between recording, reporting, and representing events and the creation for the viewer of the subjective experience of the unfolding of events. All students will be expected to complete several short narrative works, all of which will be critiqued in class. May be repeated twice for credit. *Prerequisite:* one required but two recommended. VA 165, 167, 172, 173, 177, 186; VA 177 strongly recommended.

#### 180. Documentary Media (4)

This is a production course investigating the concept of documentary. Studying examples from the documentary traditions of film, video and photography, this course will develop a critical discourse centering around the representation of 'truth', the concept of point of view, the objective/subjective paradox, the dynamic forces of context, and the overlap with the narrative and experimental traditions. Final project required. May be repeated twice for credit. *Prerequisites:* VA 165 and 167; or 172 and 173; or 186; VA 177 strongly recommended.

#### 181. Sound and Lighting (4)

An advanced course aimed at gaining a sophisticated control on the application of sound and lighting theory. Examples in film and video will be screened and discussed. The sonic portion of the course will trace the evolution of film and video recording and manipulation, emphasizing current practice and equipment. The areas of acoustics fundamental electronics, microphones and recording devices, and the general theories of sound image relationship will be covered. The second portion of the course will study the theory and practice of illumination for film and video production. The strategies, processes, and equipment for both studio and location lighting will be covered. Each student will produce a project for each section of the course. *Prerequisite:* one from either VA 172, 173, or 186.

#### 182. Advanced Editing (4)

Covering both film and video editing, this course is designed to study the problems of editing from both a theoretical and practical point of view. Films and tapes will be analyzed on a frame-by-frame, shot-by-shot basis. Students will edit stock material as well as generate their own materials for editing a final project. The aesthetic and technical similarities and differences of the film and video media will be a major topic. Course may be repeated twice for credit. *Prerequisite:* VA 177 and either 172, 173, or 186.

#### 186. 16mm Film Strategies (4)

This production course is designed to heighten the students' understanding of film theory and practice utilizing 16mm gauge film. The techniques of camerawork, lighting, editing, sound, printing, and processing will be covered. Students should anticipate spending large quantities of time outside class on their projects. A final project will be required. The supplies provided by the student for this course are more expensive than for other production courses. *Prerequisites:* VA 1 or 2 or 3 or 4, 14, 60, 70, 71, 84.

#### 187. Animation (4)

Founded in a historical context of personally produced work, beginning with Emile Cohl and continuing through contemporary work, this production course will cover both the theory and technique of film animation. Video animation will be discussed. Drawn, cell, object, and collage animation will be explored. Students should anticipate spending large quantities of time outside of class on their projects. Each student will be expected to complete several assignments as well as a three- to five-minute 16mm film. May be repeated once for credit. *Prerequisite:* consent of instructor.

#### 188. Optical Printing (4)

An intensive, hands-on 16mm production workshop utilizing the facilities of the Department of Visual Arts' special effects

lab. The course, which is moderately technical in nature, is fundamentally concerned with the meaning of filmic manipulation through time. Numerous class exercises. Enrollment limited to sixteen students. May be repeated once for credit. *Prerequisites:* VA 60 and 186 or consent of instructor.

#### 195. Teaching in Visual Arts (4)

Each student will meet with a section once a week under the direction of the instructor. The student will be required to attend the lecture in the course and to meet with the instructor at least once each week. May be repeated three times for credit. *Prerequisite:* consent of instructor.

NOTE: Only open to highly advanced upper-division students. Requires both instructor's and department chairperson's approval. Pass/Not Pass grades only.

#### 198. Directed Group Study (2-4)

Directed group study on a topic or in a group field not included in regular department curriculum, by special arrangement with a faculty member. *Prerequisite:* consent of instructor

NOTE: Only open to upper-division students. Requires instructor's, department chairperson's, and provost's approval. Pass/Not Pass grades only.

#### 199. Special Studies in the Visual Arts (4)

Independent reading, research, or creative work under direction of a faculty member. *Prerequisite:* consent of instructor.

NOTE: Only open to upper-division students. Requires instructor's, department chairperson's, and provost's approval. Pass/Not Pass grades only.

## Graduate

#### 204. Performance (4)

The class considers the performance aspect of much contemporary art. All graduate students, including those without a performance background, are welcome. Students will consider their own work within a process-oriented or performance context. The course will feature collaborative and critical participation, which is intended to offset the often isolated conditions under which most graduate students work. Talks given by visitors will offer an insider's view to the conditions, problems, and aspirations of practicing performance artists. Each student is responsible for a large project to be presented by the end of the term. May be repeated for credit.

#### 205. Graduate Studies in Drawing (4)

A studio course in drawing focusing on individual projects. May be repeated for credit.

#### 206. Graduate Studies in Painting (4)

A studio course in painting focusing on individual projects. May be repeated for credit.

#### 207. Graduate Studies in Sculpture (4)

A studio course in sculpture focusing on individual projects. May be repeated for credit.

#### 208. History of Performance (4)

This course will survey the origins and development of recent performance in the visual arts. Such movements as Gutai (Japan), Yves Klein's anthropometries, happenings, events, Fluxus (Europe and U.S.A.), earthworks, bodyworks, postal art, conceptualism and feminist performance comprise the broad range of activity in the last twenty-five years. The class will examine the theoretical bases and critical issues of performance as these may relate to the larger field of the arts today.

#### 214. Intentionality (4)

This course is concerned with an inquiry into the possibility and conditions of interpretation of works of visual art. How are the wider contexts of the work, the intentions — conscious or otherwise — of its author, the immediate psychic and material circumstances of its creation, its envisioned function, and the persona who is the fictional counterpart of the real-life viewer, encoded into its structure? Previous theoretical approaches to these issues will be examined, alternative analytical models suggested, and these tested in a detailed analysis of specific works of art.

#### 216. The Object (4)

An inquiry into the world of artifacts (some of them "works of art") by which human beings are surrounded, and the ways in which they function as agents of communication and modifiers of consciousness. Contemporary perspectives drawn from the fields of anthropology, sociology, contemporary art, and semiotics will be utilized alongside those derived from art theory, especially the structural-analytic tradition.

#### 218. Marcel Duchamp (4)

A critical examination of the work of the most radical of the twentieth-century artists. In Duchamp's four-dimensional perspective, the ideas of art-object, artist, and art itself are deconstructed. *The Large Glass* and *Étant Donnés* . . . are the twin foci of an oeuvre without boundaries to which the invention of most of twentieth-century's avant-garde devices (chance techniques, conceptual art, etc.) are only incidental.

#### 222. Communities and Art (The Shakers, William Morris & Co., and Bauhaus) (4)

A critical review of three communities which aimed to change the social and spiritual quality of life by aesthetic means. *Prerequisite:* graduate status or consent of instructor.

#### 230. Graduate Studies in Art Criticism: Theory (4)

Seminars for advanced students in art criticism and art history in relation to the problems set by the real phenomenon of art production. Specifically advanced, individual projects will be required of graduate students. May be repeated for credit.

#### 232. Tactics and Strategies (4)

A workshop-laboratory class involving a game-theory approach to the making of art in which attempts will be made to define a domain of interaction between a variety of possible players, the simplest of which is a two-person game involving art-audience.

#### 236. Graduate Studies in Art Criticism: Practice (4)

This course is largely for people who intend to write criticism. It will attempt to explore various approaches to criticism largely through the writings of contemporary art criticism, though literary and film criticism will also be considered. Each student will be expected to write and deliver several short critical papers on subjects within his or her competence. May be repeated for credit.

#### 237. Graduate Studies in Art (4)

This course provides the opportunity for in-depth graduate study in the practical, critical, ideological, or theoretical contexts and contents of art making. Courses under this heading may reflect current interests of the instructor or treat a controversial issue in the art world. In recent years, the course has been devoted to topics such as film history in Russia after the Revolution, exploration in subject matter and form, scripting (film, video), portraiture, art as editing, art and technologies. May be repeated for credit.

#### 244. Charting and Subject Matter (4)

This is a narrative-based course which uses various forms of storytelling. It focuses on a methodology for establishing autobiographical material, ordering it and presenting it in various media.

#### 278. Graduate Video Seminar (4)

The seminar will examine video as an art form, with particular emphasis on recent works of independent video artists. The specific expressive nature of the video image, questions of form and meaning, and the evolving relationship of video art to the other arts will be studied in depth.

#### 279. Graduate Video Workshop (4)

The course explores creative aspects of the video medium through various formats, styles and approaches in independent production, integrating elements into artistic form. Concept, development from script, shooting, editing, sound, etc., will be stressed. May be repeated for credit. *Prerequisite:* consent of instructor.

#### 288. Advanced Studies in Film (4)

A film course dealing with all aspects of film criticism and film writing, stressing individual problems. May be repeated for credit.

#### 289. Graduate Film Seminar (4)

Designed to deal with a wide variety of practical aspects of the film, including direction, script writing, criticism, and photography. *Prerequisite:* consent of instructor.

#### 290A. Graduate Seminar (4) Contemporary World Views

As products of a human mind, all works of art are conceived within the value system of their maker. Whether or not the artist is conscious of it, the world of art reflects a world view. Once produced, it becomes susceptible to interpretations which attach to it or find in it human values. Some of these values are ideological, such as "socialist realism," others are more a matter of artistic outlook or belief, such as "expres-



## WARREN COLLEGE

sivist," "idealist," "mimetic," and "realistic." This course will locate the world views implicit within contemporary works of art, including, when appropriate, those of the faculty and graduates. Required of first-year students.

### **290B. Graduate Seminar (4) Critical Approaches to Art Making: Context, Subtext, and Pretext**

This course is designed to encourage the development of a self-critical approach to art making. Key intellectual issues of contemporary art will be explored through the discussion of writings by artists and critics. Topics to be discussed include the concept of artistic tradition; art and politics and the politics of art and criticism; women's art and feminism; modernism and post-modernism as period concepts; representation, re-presentation and the textuality of art; the function and significance of quotation and appropriation in art; and media specific approaches to art. Required of first-year students.

### **290C. Graduate Seminar (4) The First-Year Review**

This course will focus on the students' work-in-progress in preparation for their First-Year Review exhibitions. Exhibitions will be planned as unified art works, that are energized by a cluster of related ideas within a particular context and scene, rather than as a space and time lent for the showing of pictures or sculpture. Professional decision making about publicity, space allocation, budget, etc., will also be considered. Required of first-year students.

### **290D. Graduate Seminar (4) Studio Critiques**

This course will be devoted to rigorous, in-depth critiques of the students' ongoing and previous work. A member of the class (but not the person whose work is being focused on) will take a turn leading the discussion each week. Offered during winter quarter of each year and required of all second-year students.

### **295. Individual Studies for Graduate Students (1-12)**

Individual research for graduate students in preparation for their comprehensive examinations for the M.F.A. degree.

### **298. Directed Group Study (1-12)**

Directed group study on specific topics not covered at present in the normal curriculum. Used as an experimental testing of courses that may be given regular course numbers if proved successful. Special arrangement with faculty member. *Prerequisite: consent of department.*

### **299. Graduate Research (1-4)**

Graduate-level research under the direct guidance of a faculty member. *Prerequisite: consent of instructor.*

### **500. Apprentice Teaching (1-4)**

Apprentice teaching in undergraduate courses given by the Department of Visual Arts. Graduate students are required to teach a minimum of one quarter (three units) within the department to fulfill degree requirement.

## WARREN COLLEGE

OFFICE: Building 302, Matthews  
Administrative and Academic Complex

### **The Writing Program**

OFFICE: Building 410, Matthews Administrative and Academic Complex

Warren College 10A-10B is required of every Warren College student and must be taken immediately following completion of the Subject A requirement. The purpose of the sequence is to teach students, through constant practice and coaching, to read carefully, to communi-

cate authentically in writing, and to criticize with a sense of the demands of varying contexts. Classes are very small and center on group discussion of student work.

The course emphasizes a variety of forms and aims of writing, and includes attention both to narrative and to analytical and argumentative writing based on sources. The readings focus on the general theme of the relation of the individual and society, with a marked emphasis on the American tradition. Thus, the readings help to prepare the students for work in the Ethics and Society course. Readings may include novels, essays, biographies, sermons, political documents, and book-length nonfictional treatments of the theme.

In both 10A and 10B, student papers are duplicated, distributed in class, and discussed by the class as a whole in a workshop setting. Each student also attends individual conferences with the instructor. Every student receives a mid-quarter evaluation and a final narrative evaluation which is placed in the student's file. The minimum writing requirement is 8,000 words per quarter. Warren College 10A-10B is offered P/NP only, and students may not test out of the requirement.

### **10A-10B. The Writing Course (4-4)**

A workshop course in reading and writing required of all Warren College students. The course emphasizes a variety of forms and aims of writing and includes attention both to narrative and to analytical and argumentative writing based on sources. *Prerequisite: satisfaction of the university Subject A requirement.*

## The Scholars Program

OFFICE: Warren Scholars Program,  
Building 405, Matthews Administrative  
and Academic Complex

Warren Scholars is a four-year program offering an interdisciplinary academic curriculum and special activities that foster close student-faculty interaction, promote a sense of community, and enrich undergraduate education and student campus life. The Scholars Program offers students educational, cultural, and social experiences designed to help students broaden their intellectual interests beyond their major. Throughout the program, recognition for outstanding scholastic achievement is given to students. An annual reception is held in their honor with participating faculty and key college staff. Juniors may each receive a small stipend to subsidize their required research project, and the Michael Addison Award is given to the junior scholar with the most distinguished research paper. Each scholar completing the program receives a transcript notation

on UCSD records certifying completion of the Warren Scholars Program and is given special honors during graduation ceremonies.

### **Eligibility Requirements**

Eligibility requirements that result in automatic admission of entering UCSD students to the program are a high school GPA of 3.8 and an SAT score of 650 in verbal and 650 in mathematics. To maintain status in the Scholars Program, all students must be on the Provost's Honor List at least one quarter per year. All students with outstanding academic credentials are encouraged to apply by writing to: Warren Scholars Program, Warren College, Q-022, UCSD, La Jolla, CA 92093.

### **Academic Program**

*Freshman Year* — The scholars will enroll in a Warren Scholars Seminar (Warren 11A-11B) in the fall and winter quarters. Each of the two seminars will focus on an interdisciplinary study. These courses will replace the required Warren College writing courses.

*Sophomore Year* — Scholars may elect a special section of another required Warren College course, Ethics and Society (Philosophy 27 or Political Science 27). Upon successful completion of WC11A and WC11B, Ethics and Society may be taken in the spring quarter of the freshman year.

*Junior Year* — Scholars may replace one upper-division course in a minor (program of concentration or area study) with an independent study supervised by a faculty member. Alternatively, they may write an honors research paper in conjunction with a course in a minor field. Book awards will be available to all junior scholars to support their research, and the college will award a scholarship prize for the most outstanding junior research paper.

*Senior Year* — The scholars may serve as teaching assistants in the Warren Scholars Seminar, for which they may receive academic credits for apprentice teaching.

*Special Activities* — Scholars participate in a wide range of activities that promote educational, cultural, and social experiences with faculty and key Warren College staff members. These informal extracurricular events provide opportunities for students to examine shared experiences from the diverse perspectives of their peers and faculty members. Typically, one informal special activity is held each quarter, and each one serves to

build and maintain a sense of community among the scholars.

**11A-11B. Warren Scholars Seminar (4-4)**

The purpose of the Warren College Scholars Seminar is to allow students to develop and refine their expressive and analytical skills by participation in a two-quarter sequence. The emphasis will be on an interdisciplinary approach to a group of texts chosen for this purpose. The texts will be selected in order to form a coherent and detailed investigation of issues central to the relation of man and society. The first quarter will explore topics relating to man's view of himself, and the second quarter will focus on man's view of society. Topics may vary and may include the function of evidence and observation in the formation of theories, the moral dimension of the theorist's role, and the economic implications of ideologies.

**Ethics and Society**

OFFICE: Interdisciplinary Programs,  
Building 405, Matthews Administrative  
and Academic Complex

Ethics and Society is an interdisciplinary course required of all Warren students entering fall 1985 and thereafter. It is cross-listed as Political Science 27 and Philosophy 27 (see departmental listings). A student may enroll in this course through either department, but not both. Ethics and Society is to be taken after the completion of Warren Writing 10A-10B (or Scholars Seminar 11A-11B), either in the spring of the freshman year or in any quarter of the sophomore year.

**Health Care — Social Issues**

OFFICE: Interdisciplinary Programs,  
Building 405, Matthews Administrative  
and Academic Complex

Health care — social issues is an interdisciplinary minor administered by Warren College but available to all UCSD students with a general interest in health care issues and to students considering a health care career. For more information, see listing under "Health Care — Social Issues."

**Law and Society**

OFFICE: Interdisciplinary Programs,  
Building 405, Matthews Administrative  
and Academic Complex

Law and society is an interdisciplinary minor administered by Warren College, but available to all UCSD students with a general interest in law as a social institution and to students considering law-related careers. For more information, see listing under "Law and Society."

**Academic Internship**

OFFICE: Building 406, Matthews  
Administrative and Academic Complex

The Academic Internship Program is developed and administered by Warren

College, but it is available to juniors and seniors with a 2.5 GPA in any college at UCSD. For more information, see listing under "Academic Internship."

**WOMEN'S STUDIES**

OFFICE: 2024 Humanities and Social  
Sciences Building, Muir College  
534-3589

**Professors:**

- Eleanor Antin, B.A. (*Visual Arts*)
- Abraham Dijkstra, Ph.D. (*Literature*)
- Michael Meeker, Ph.D. (*Anthropology*)
- Louis Montrose, Ph.D. (*Literature*)
- Carol Plantamura, M.F.A. (*Music*)
- Melford Spiro, Ph.D. (*Anthropology*)
- Marc Swartz, Ph.D. (*Anthropology*)
- Jacqueline Wiseman, Ph.D. (*Sociology*)

**Associate Professors:**

- Rae Blumberg, Ph.D. (*Sociology*)
- Page DuBois, Ph.D. (*Literature*)
- Thomas Dublin, Ph.D. (*History*)
- Suzanne Gearhart, Ph.D. (*Literature*)
- Helene Keyssar, Ph.D. (*Communication*)
- Susan Kirkpatrick, Ph.D. (*Literature*)
- Chandra Mukerji, Ph.D. (*Sociology*)
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- Jehanne Teilhet, Ph.D. (*Visual Arts*)
- Sandra Vehrencamp, Ph.D. (*Biology*)
- Cynthia Walk, Ph.D. (*Literature*)

**Assistant Professors:**

- Mounira Charrad, Ph.D. (*Sociology*)
- Susan G. Davis, Ph.D. (*Communication*)
- Stephanie Jed, Ph.D. (*Literature*)
- Rachel Klein, Ph.D. (*History*)
- Catherine Lowe, Ph.D. (*Literature*)
- Carol Padden, Ph.D. (*Communication*)
- Kathryn Shevelow, Ph.D. (*Literature*)

**Adjunct Associate Professor:**

- Mary Walshok, Ph.D. (*Sociology*)

The rapid and dramatic changes in the roles of women (and men) during the last two decades have generated great interest and given rise to the serious study of the origins and meanings of gender. In response to these changes and growing student interest, the faculty at UCSD has created a Women's Studies Program designed to promote teaching and scholarship in a wide range of disciplines — literature, sociology, psychology, history, and philosophy, to name just a few. The goal

of the program is to understand the social, historical, economic and biological dimensions of "women's place."

The centerpiece of the program is a women's studies minor open to undergraduates in all colleges. The minor consists of six courses, at least three of which must be upper-division, selected from a group of courses which have been approved by the Women's Studies Steering Committee and the Committee on Educational Policy. Students may enroll in individual courses as well.

Of the six courses offered for the minor no more than two may come from the same department. We include this provision to ensure that students take courses broadly from among those available and that they do not focus simply on the courses within their departmental major. To facilitate student advising there is a women's studies faculty member affiliated with each college. In addition, women's studies faculty will be working with counselors in each college and with students from the Women's Center to help students explore their interests within the minor, and to pursue independent projects of study and reading.

**Approved Courses for the Women's Studies Minor**

**Anthro. 114. Family, Childhood, and Society (4)**

A comparative and analytic study of the relationship between family structure and childhood experience, and their effects on social and cultural systems. Spiro

**Anthro. 115 The Family in Cross-Cultural Perspective (4)**

Sources of power, types of relationships, and the means by which family members seek goals will be examined in the context of the culture of the society in question. Family life in societies from various parts of the world, including the United States, will be considered. Swartz

**Anthro. 121. Women in Cross-Cultural Perspective (4)**

A comparative and analytic study of the ways women function in a variety of settings. Particular attention will be given to the cultural aspects of women's roles. *Prerequisite:* AN 22 or introductory anthropology at another university. Justus

**Anthro. 124. Sex, Love, and Culture (4)**

This course will deal with cultural and psychological factors in sexual behavior and sex-related roles both within and beyond the social context of the family. The course will have an evolutionary and cross-cultural perspective. The symbolic elaboration of sex and the replacement of "arranged" with "love" relationships will also be explored. *Prerequisite:* AN 22 or introductory anthropology at another university. Schwartz

**Anthro. 166. Family and Society in the Near East (4)**

An introduction to the historical and sociological study of societies with Islamic traditions and a discussion of the social and political problems associated with such societies. *Prerequisite:* AN 22 or introductory anthropology at another university. Meeker

**Chicano Studies 132. La Chicana (4)**

A critical perspective of the Chicana's present minority status through an exploration of relevant crucial issues (i.e., employment, education, health, family). *Prerequisite:* upper-division standing.

**Comm/Cul 108. Images of Women (4)**

An analysis of American stereotypes of women and their use in media images. Student involvement includes (1) reviewing

## WOMEN'S STUDIES

literature on the sociology of sex-roles; (2) developing media portraits of women to serve as data for class analysis; and (3) writing final paper on the stereotypes employed in generating these portraits. *Prerequisites: Comm/Cul 100 and Comm/Gen 100-VA 170, or consent of instructor.* Warren

### **Comm/Cul 115. The Theatre of Private Life: Family and Friends (4)**

(Cross-listed with Drama 146.) A close examination of theatre informed by a concern for the nature of human interaction and personal interplay, as revealed by conflict within families or small groups. *Prerequisites: Drama 42, 43, 44 or Comm/Cul 100 required. Comm/Gen 100/NA 170 recommended or consent of instructor.* Keyssar

### **History 29. Women in American Thought and Culture (4)**

An exploration of the relationship between changing popular attitudes about women and the emergence of feminist theories. Topics will include women in colonial America, the culture of domesticity, emergence of the women's movement, images of feminine beauty, women and progressive reform, women in the movies, the impact of World War II, contemporary feminist theories. Readings will be drawn from history and literature. Klein

### **History 128A-B. The History of Women in Europe (4-4)**

A lecture-discussion course focusing upon the history of women in Europe from the beginning of the Middle Ages to the present. 128A deals with changes in women's roles, status, and sexual taboos from the beginning of the Middle Ages to 1789. 128B covers the history of women from the Industrial Revolution to the present, focusing on the role of women in radical political movements, the evolution of women's work and feminism. History 128A is not a prerequisite to 128B. Norberg

### **History 163A-B. History and Social Role of Women in the United States (4-4)**

A two-quarter course examining the history of women in the U.S. as members of different ethnic, racial, and socio-economic groups from preindustrial times to the present. Emphasis is on the interrelationship between women's economic, social, and family roles. Each half may be taken separately. Dublin

### **History 163Q. Selected Topics in American Women's History (4)**

The specific content of the course will vary from year to year but will always analyze in depth a limited number of issues in American women's history. Preference in enrollment will be given to students who have already taken History 163A or B. Dublin

### **Lit/En. 149. Themes in English and American Literature (4)**

A consideration of one of the themes that recur in many periods of English or American literature; for instance, love, politics, the role of women in society. (May be taken for the women's studies minor when the theme of women is the course focus.)

### **Lit/Gen 131. Literature and Ideas (4)**

This course will center on writers or movements of international literary, cultural, or ideological significance. The texts studied, if foreign, may be read either in the original language or in English. (May be taken for the women's studies minor when the theme of women is the course focus.)

### **Lit/Gen 132. Women and Literature (4)**

This course will explore the relationship between women and literature, i.e., women as producers of literature, as objects of literary discourse, and as readers. Foreign language texts will be read in translation. May be repeated for credit as topics vary.

### **Phil. 126. Sex Differences: Origins and Implications (4)**

This interdisciplinary course focuses on the origins of sex differences and their political, social, and moral implications. Issues include: evolutionary, biological, cross-cultural, and sociological evidence for sex differences; legal, economic, social, and psychological effects of present differential treatment of the sexes; moral issues concerning the justification of present practices, preferential treatment, sexual role stereotypes, and family organization. *Prerequisite: upper-division standing or consent of instructor.*

### **Sociol. 118. Sociology of Sex and Gender Roles (4)**

(Numbered 173 prior to 1981-82.) An analysis of the social, biological, and psychological components of becoming a man or a woman. The course will survey a wide range of in-

formation in an attempt to specify what is distinctively social about gender roles and identities; i.e., to understand how a most basic part of the "self" — womanhood or manhood — is socially defined and socially learned behavior. Luker

### **Sociol. 129. The Family (4)**

(Numbered 173 prior to 1981-82.) An examination of the family as an institution in modern and premodern societies. This course will begin with a study of the principles of kinship and then investigate the relationship of the family to social structure and social change. Charrad

### **Sociol. 133. Comparative Sex Stratification (4)**

(Numbered 171 prior to 1981-82.) Utilizing a new theory of factors affecting female status, we examine topics including women in evolutionary perspective; Third World women and modernization; women's changing position in the USSR, Israeli Kibbutz, and especially the U.S.A.; and the political economy of sex stratification. Blumberg

### **Vis. Art 127C. Female Artists and Female Imagery (4)**

This course will analyze the equivocal role of women as artists in selected non-Western societies with a look at parallel phenomena in the West. It will also examine, within given cultural contexts, the significance of female imagery: what type of female images predominate (e.g., mother/child, splayed female, etc.) and who are the patrons and/or consumers of these images. *Prerequisite: one upper-division art history course; two recommended.*

# APPENDIX

## NONDISCRIMINATION STATEMENT

The University of California, in compliance with Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Age Discrimination Act of 1975, does not discriminate on the basis of race, color, national origin, sex, handicap, or age in any of its policies, procedures, or practices; nor does the university discriminate on the basis of sexual orientation. This nondiscrimination policy covers admission and access to, and treatment and employment in, university programs and activities, including but not limited to, academic admissions, financial aid, educational services, and student employment.

Inquiries regarding the university's equal opportunity policies may be directed to: Dr. Faustina Solis, Compliance Coordinator, Third College Administration Bldg., (619) 534-4002.

## NOTICE TO STUDENTS OF THEIR PRIVACY RIGHTS

In accordance with the Federal Family Educational Rights and Privacy Act of 1974 and campus procedures implementing the University of California Policies Applying to the Disclosure of Information from Student Records, students at the San Diego campus of the university have the right:

- To inspect and review records pertaining to themselves in their capacity as students;
- To have withheld from disclosure, absent their prior consent for release, personally identifiable information from their student records, with exceptions as noted in Section 10.70 of the university's policies (see also Directory or Public Information below);
- To inspect records maintained by the campus of disclosure of personally identifiable information from their student records;
- To seek correction of their student records through a request to amend the records or a request for a hearing; and
- To file complaints with the Department of Education regarding alleged violations of the rights accorded them by the Federal Act.

## POLICIES FOR REVIEWING RECORDS

The University of California has issued policies applying to the disclosure of information from student records. These can be found in Part B "Policies Applying to Campus Activities, Organization, and Students" issued October 1983. In brief, these policies permit students to review their respective records maintained at

UCSD and outlines the procedures for challenging any inaccurate or misleading information contained in the records. Copies of these policies are available free of charge in the Special Services Center Office in the Student Center, Bldg. B. The complete text of the Federal Family Education Rights and Privacy Act of 1974 as amended is also available for review in that office.

Questions about these rights should be referred to the Director, UA/Special Services, Nick Aguilar, in Bldg. B of the Student Center, telephone 534-6225. Copies of the Federal Act and the full text of the UC Policies are available at that office.

## The Regents of the University of California

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The term of office of appointed regents is twelve years, and terms expire on March 1 of the year indicated. The student regent (indicated with an asterisk) is appointed for a one-year term which expires on June 30 of the year indicated.

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## University Professors

The title University Professor is reserved for scholars of international distinction who are recognized and respected as teachers of exceptional ability. Appointments to this title are permanent, and may be made from among the distinguished tenured staff of the University of California, or from individuals outside the university.

University Professors are available for inter-campus travel for purposes of discussions with staff and students on subjects related to research, teaching, and other matters of interdisciplinary interest.

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La Jolla, CA 92093

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The UCSD Board of Overseers was established in 1973 to advise and assist in the university's continuing development. The board is asked to give independent advice on issues of its own choice as well as on those presented by the chancellor including the annual operating budget, capital projects, and various policy issues of importance to both the campus and the community. Board members are appointed by the chancellor to serve for two years.

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**Salary and Employment  
Information UCSD  
Bachelor's Degree Recipients**

The salary averages are figured according to occupational classifications.

| Occupation          | Average Salary |
|---------------------|----------------|
| Technical           | \$26,200       |
| Managerial          | \$18,400       |
| Sales/Marketing     | \$19,900       |
| Health/Life Science | \$16,600       |
| Financial           | \$19,300       |
| Communications      | \$16,900       |
| Educational         | \$15,700       |
| Social Services     | \$17,800       |

The employment status of the graduates who sought to enter the workforce is as follows:

|                    |     |
|--------------------|-----|
| Employed Full-time | 83% |
| Employed Part-time | 12% |
| Looking for work   | 5%  |

Source: *UCSD Graduates — A Summary of 1985 Survey Results*. Information based only on those who sought to enter the workforce immediately after graduation. Survey conducted of June 1985 graduates in December, 1985.

**UCSD FACTS AND FIGURES  
(as of Fall 1986)**

On-campus student enrollment

|   |        |
|---|--------|
| Undergraduate   | 13,094 |
| Muir  | 3,477  |
| Revelle   | 3,284  |
| Third   | 3,033  |
| Warren  | 3,300  |
| Graduate  | 1,896  |
| Medical School (excluding 435 Medical Center residents and interns) | 515    |
| Total Students  | 15,505 |

On-campus teaching faculty members

|  |    |
|--|----|
| Fellows, National Academy of Sciences          | 45 |
| Fellows, American Academy of Arts and Sciences | 51 |
| Nobel Prize laureates                          | 5  |
| Fields Medal                                   | 2  |

Total land area — UCSD

|                |       |
|----------------|-------|
| Main campus    | 1,191 |
| Outlying areas | 745   |
| Total Acres    | 1,936 |

|                             |           |
|-----------------------------|-----------|
| Books in library collection | 1,760,614 |
| UCSD Extension enrollment   | 9,200     |

Grade-point averages

|                              |      |
|------------------------------|------|
| Lower-division undergraduate | 2.88 |
| Upper-division undergraduate | 2.83 |
| Graduate                     | 3.72 |

Number of undergraduates in most popular majors

|  |       |
|--|-------|
| Biology                                      | 2,317 |
| Electrical Engineering and Computer Sciences | 1,921 |
| Applied Mechanics and Engineering Sciences   | 1,225 |
| Economics                                    | 1,076 |
| Psychology                                   | 739   |
| Communication                                | 652   |
| Political Science                            | 557   |
| Mathematics                                  | 543   |
| Physics                                      | 499   |
| Literature                                   | 366   |
| Visual Arts                                  | 323   |
| Chemistry                                    | 215   |

Based upon previous three years' experience, approximately 92 percent of all undergraduates enrolled at UCSD in the fall quarter will also be enrolled for the spring quarter. Questions or requests for more detailed information should be directed to the Office of the Associate Vice Chancellor, Planning.

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| Accounting                                    | O-6  | Biomedical Library   | M-7  | Aquarium-Museum (Vaughan Hall)               | B-14 | Old Scripps Bldg.                            | A-14 |
| Administrative Complex                        | N-5  | Central University Library                                     | O-4  | Benthic Laboratory                           | A-14 | Physical Oceanography & Space Sciences Bldg. | D-12 |
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## Academic Offices

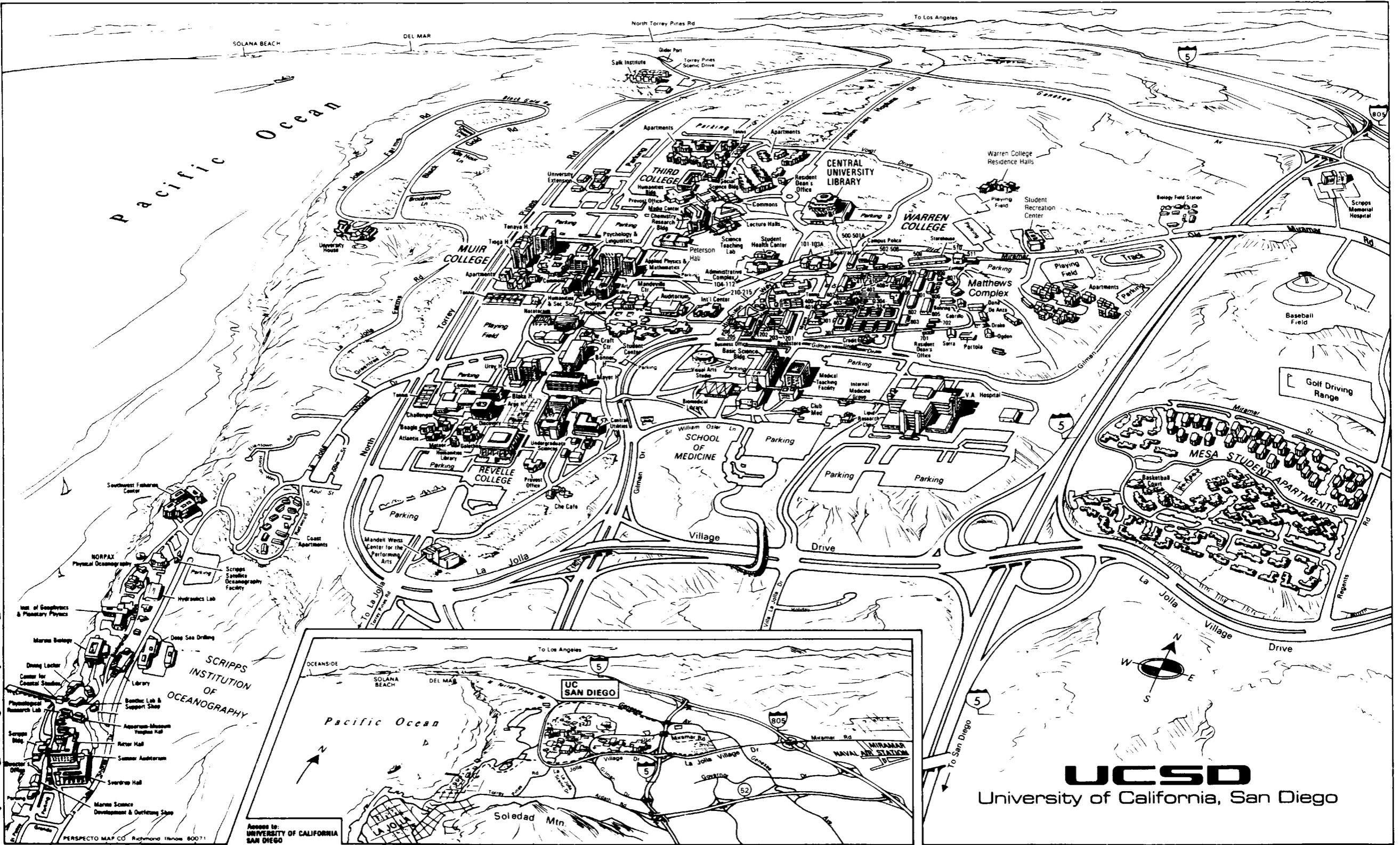
Academic Internship Program, Building 302, Warren College  
 Academic Support and Instructional Services (OASIS), Student Center  
 Anthropology, room 8012 Humanities & Social Sciences Bldg.  
 Applied Mechanics and Engineering Sciences (AMES), room 5202 Urey Hall  
 Biochemistry, room 4422 Mayer Hall  
 Biology, room 2130 Bonner Hall  
 Biophysics, room 3430 Mayer Hall  
 Chemistry, room 2112 Urey Hall  
 Chicano Studies, room 243 Humanities Bldg.  
 Chinese Studies, room 8004 Humanities & Social Sciences Bldg.  
 Classical Studies, room 5016 Humanities & Social Sciences Bldg.  
 Communication, room 127 Media Center/Communications Bldg.  
 Comparative Studies in Language, Society and Culture, room 1532 Humanities-Library Bldg.  
 Contemporary Black Arts, rooms 239/240 Humanities Bldg.  
 Contemporary Issues, room 2024 Humanities & Social Sciences Bldg.  
 Cultural Traditions, room 2024 Humanities & Social Sciences Bldg.  
 Drama, room 2550 Humanities-Library Bldg.  
 Earth Sciences, room 1512 Humanities-Library Bldg.  
 Economics, room 225 Social Science Bldg.  
 Education Abroad Program, International Center  
 Electrical Engineering and Computer Sciences (EECS), room 3216 Applied Physics & Mathematics Bldg.  
 Engineering, Division of, room 7202 Urey Hall  
 Frontiers of Science, room 1512 Humanities-Library Bldg.  
 Health Professions Program, Building 405, Warren College  
 History, room 5024 Humanities & Social Sciences Bldg.  
 Humanities, room 1512 Humanities - Library Bldg.  
 Judaic Studies, room 2024 Humanities & Social Sciences Bldg.  
 Language, Language Center, room 2125 Psychology & Linguistics Bldg.  
 Linguistics, room 5237 Psychology & Linguistics Bldg.  
 Literature, room 115 Humanities Bldg.  
 Mathematics, room 7313 Applied Physics & Mathematics Bldg.  
 Muir Writing Program, Provost's Office, Muir College  
 Music, room 110 Mandeville Center for the Arts  
 Natural Sciences, Provost's Office, Revelle College  
 Neurosciences, room 3034 Basic Science Bldg.  
 Philosophy, room 3112 Humanities-Library Bldg.  
 Physical Education, Gymnasium  
 Physics, room 3426 Mayer Hall  
 Physiology and Pharmacology, room 1046 Basic Science Bldg.  
 Political Science, Building 412, Warren College  
 Psychology, room 5217 Psychology & Linguistics Bldg.  
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 Science, Technology and Public Affairs, Building 412, Warren College  
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 Sociology, room 7001 Humanities & Social Sciences Bldg.  
 Subject A, room 2346 Humanities & Social Sciences Bldg.  
 Teacher Education Program, room 113 Social Sciences Bldg.  
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 Urban Studies and Planning, room 235 Humanities Bldg.  
 U.S.-Mexican Studies, Institute of the Americas  
 Visual Arts, room 214 Mandeville Center for the Arts  
 Warren College Writing Program, Building 410, Warren College



# CAMPUS MAP

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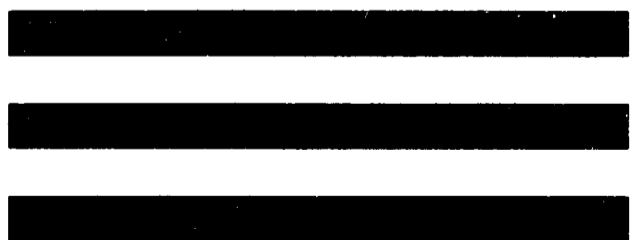
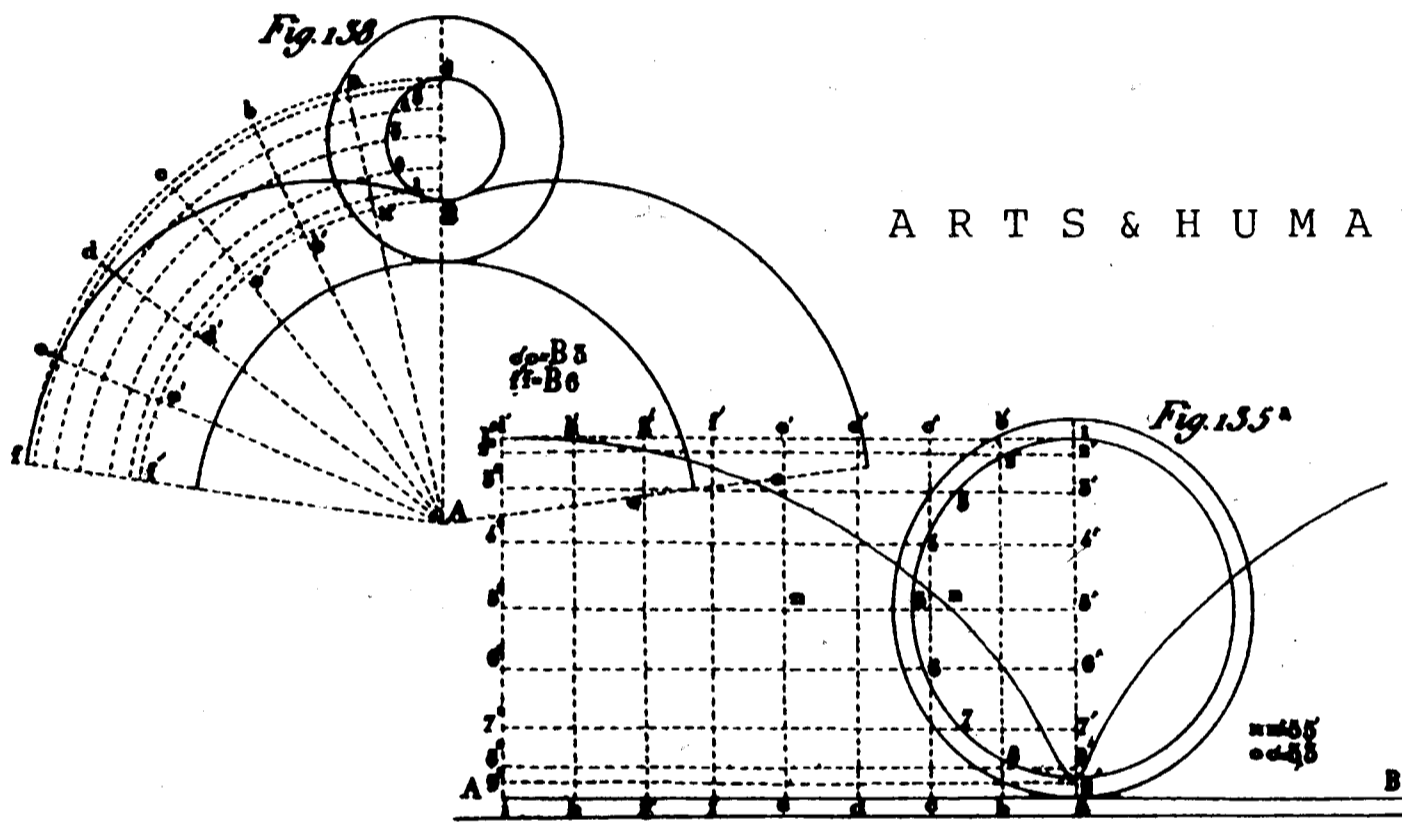
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