San Diego State

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# San Diego State 

Gemeral Catalog 1971.72

San Diego, California



## Academic Calendar 1971-72

September 13-17
September 20
October 11
October 25
November 25-26
December 20-January 1
January 3
January 17-18
January 19
January 28
January 31-February 4
February 7
February 12
February 21
March 27-31
April 3
May 29
May 29-30
May 31
June 4
June 9
June 26-August 4
August 7-25

Orientation
Classes begin
Columbus Day, holiday
Veteran's Day, holiday
Thanksgiving recess
Winter recess
Classes resume
Study and consultation
Finals begin
End, fall semester
Orientation
Classes begin
Lincoln's birthday, holiday
Washington's birthday, holiday
Spring recess
Classes resume
Memorial Day, holiday
Study and consultation
Finals begin
Baccalaureate ceremony
Commencement
Summer Term I
Summer Term II

## The California State Colleges

Academic year 1971-72 marks for the California State Colleges the beginning of their second decade of service to the people of California as a unified system of public higher education-the largest such system in the Western Hemisphere and one of the largest in the world. Brought together as a system under an independent Board of Trustees Brought together as a system under an independent Board early 1960's,
as a result of the Donahoe Higher Education Act in the the California State Colleges now number nineteen, covering the state from Humboldt State College in the north to San Diego State College in the south. Current enrollment exceeds 244,000 full- and part-time students, with a faculty of approximately 14,000 .
Responsibility for the California State Colleges is vested in the Board of Trustees, whose members are appointed by the Governor, and the Chancellor, who is the executive officer of the system. The Trustees and the Chancellor develop systemwide policy, with implementation taking place at the campus leyel. The Academic Senate of the California State Colleges, made up of elected representatives of the faculty from each college, recommends academic policy to the Board of Trustees through the Chancellor.
Each college in the system has its own unique geographic and curricular character, but all emphasize the liberal arts and sciences. Programs leading to the bachelor's and master's degrees are master-planned to anticipate and accommodate student interest and the educational of Cate of California. A limited number of and professional needs are also offered. Although there is increasing joint doctoral programs are also offered. Although there is imper of quality teaching, the primary responsibility of the faculty continues to be the instructional process.

While San Jose State College, the oldest, was founded over a century ago, prior to World War II only seven State Colleges were in existence, with a total enrollment of 13,000 . Since 1947, twelve new colleges have with established, and sites have been selected for additional campuses
been in Ventura, San Mateo, and Contra Costa counties. California State College, Bakersfield, the newest, was opened to students only last year. Enrollment in the system is expected to pass 300,000 by 1980.

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## The Colleges

$S=$ on semester system; $Q=$ on quarter system.
California Sate College,
Bakersfield (Q)
9001 Stockdale Highway Bakersfield, California 93309 Paul F. Romberg, President
California State College, Dominguez
Hills (Q)
1000 East Victoria Street
Dominguez Hills, California 90247
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California State College, Fullerton (S) 800 North State College Boulevard fullerton, California 92631
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25800 Hillary Street
Hayward, California 94542
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California State College, Long
Beach (S)
6101 East Seventh Street
Long Beach, California 90801
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California State College, Los Angeles ( Q )
5151 State College Drive
Los Angeles, California 90032 John A. Greenlee, President

California State College, San Bernardino (Q)
5500 State College Parkway
San Bernardino, California 92407
John M. Pfau, President
California State Polytechnic College,
Kellogg-Voorhis (Q)
3801 West Temple Avenue
Pomona, California 91766 Robert C. Kramer, President

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San Luis Obispo, California 93401
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Chico, California 95926
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Arcata, California 95521 Cornelius H. Siemens, President
Sacramento State College (S) 6000 J Street
Sacramento, California 95819 Bernard L. Hyink, President
San Diego State College (S) 5402 College Avenue
San Diego, California 92115
Malcolm A. Love, President
San Fernando Valley State
College (S)
18111 Nordhoff Street
Northridge, California 91324
James W. Cleary, President

The California State Colleges
San Francisco State College (S) 1600 Holloway Avenue
San Francisco, California 94132
S. I. Hayakawa, President

San Jose State College (S)
125 South Seventh Streef
San Jose, California 95114
John H. Bunzel, President

Sonoma State College (S)
1801 East Cotati Avenue
Rohnert Park, Cotati, California 94928
Thomas H. McGrath, President

Stanislaus State College ( $Q$ )
800 Monte Vista Avenue
Turlock, California 95380 Carl Gatlin, President

## Introducing San Diego State

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## President

Assistant to the President

## Executive Dean

Administrative Analys
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Facilities Planning Assistant
Manager, ADP Services
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Dean of Activities
Coordinator of Aztec Center
Dean of Admissions and Records
Admissions Officer
Evaluations Officer
Registrar
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Coordinator of Advising
Coordinator of Counseling Test Officer
Test Officer
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Director of Career Planning and Financial Aid Coordinator of Career Planning and Placement Coordinator of Financial Aid and Scholarships
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Department Chairmen and Coordinators

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Economics, Robert E. Barckley English, Lowell Tozer (Acting) French and Italian, Hilda B. Nelson Geography, Richard D. Wright German and Russian, Harry W. Paulin

Introducing San Diego State

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Sociology, Thomas L. Gillette
Spanish and Portuguese, James L. Walsh

## School of Engineering

Martin P. Capp, Dean; Fredrick T. Quiett, Associate Dean

Aerospace Engineering, John F. Conly
Civil Engineering, Iraj Noorany

Electrical and Electronic Engineering, Vincent R. Learned
Mechanical Engineering, Richard A. Fitz

## School of Social Work

Kurt Reichert, Dean; Joseph B. Kelley, Associate Dean

## Imperial Valley Campus

Joseph A. Rodney, Director; Elmer D. Baldwin, Associate Director Alan C. Smith, Coordinator, Extended Services

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President, San Diego State Alumni Association

## Imperial Valley

## Faculty

Professors: Ikeda, H., Rodney (Director)
Associate Professors: Baldwin (Associate Director), Smith, A.
Assistant Professors: Ayala, Burton, J., Duling, Franklin, Harmon,
Hill, R., Ikeda, M., King, Polich, Rice, Spencer, Story, Wilson, G.
Lecturers: Feldman, Hinshaw, Holland, Jucknath, Nadeau, Ortega, Tsiaperas
The Imperial Valley campus is a division of San Diego State. As such, it is fully accredited. Operating as a separate campus, its primary function is to provide collegiate instruction for the desert area of Southeastern California.
The campus is located at Seventh Street and Heber Avenue in Calexico, adjacent to Rockwood Plaza, a park near the center of the city. The buildings housing this campus are of early Spanish style architecture, complementing the geographic location which is within walking distance of Mexicali, Baja California, Mexico, a city of approximately 500,000 population. The campus is 120 miles east of San Diego via U.S. Interstate Highway 8. Its buildings are fully refrigerated in the summer.

The program at this campus is an integral part of San Diego State and is under the general jurisdiction of the Vice President for Academic Affairs. The curriculum includes the recommended upper division and postgraduate program of courses leading to a bachelor's degree and the Standard Teaching Credentials with specializations in elementary, secondary, and special education. In addition to its regular program, the campus assists in the administration of extension courses for the area
A major function of this campus is to foster better understanding and relations between Mexico and the United States. Since the campus is located within walking distance of the Mexican metropolis of Mexicali, the student has a unique opportunity frequently to visit a foreign country and enjoy its educational, cultural, and recreational attractions. Mexicali is linked by highway, bus, trains and airplane to the rich cultural heritage of Hermosillo, Guaymas, Mazatlan, Guadalajara, and Mexico City.
The climate of Imperial Valley is dry and mild most of the college school year, with dune buggying, water skiing in the nearby Salton Sea and Gulf of California and golfing and hiking the year around.
The full-time faculty and many of the part-time faculty are regular members of the San Diego State instructional staff. Serving at the Imperial Valley campus are full-time resident faculty members in the areas of anthropology, art, drama, English, geography, history, mathematics, political science, psychology, sociology, Spanish, elementary education, secondary education, and special education. More than fifty per cent of the full-time faculty possess the doctoral degree. Part-time faculty, selected from outstanding educators of Imperial Valley, augment the instructional programs of the Imperial Valley Campus.

Since the student-faculty ratio is low, personal student counseling can be provided. Each student is assigned a faculty adviser who assists him in arranging his program so that he is better able to realize his educational and occupational plans.

## Program

The program at the Imperial Valley campus is restricted to upper division and postgraduate courses applicable to a bachelor's degree and the Standard Teaching Credential. In general, the programs are similar to those described in this catalog for elementary and secondary teaching; however, not all majors and minors are available at Imperial Valley campus. Presently, the campus offers major programs in Spanish, English, social science, fine arts, history, and Latin American studies. Authorized programs to be added include mathematics, sociology, art, music, political science, and economics.

The Imperial Valley campus is designed to serve the needs of the following: (1) community college graduates, (2) transfer students who have satisfactorily completed two or more years of college work with an accredited college, (3) persons now teaching, but who want to complete requirements for a bachelor's degree and/or a teaching credential, (4) inservice teachers holding either a provisional credential or a partial fulfillment of requirements credential, and (5) college graduates who wish to complete the requirements for a regular teaching creden-
tial.

For those transfer students needing certain lower division college work in connection with their work at this campus, there is available in the area the Imperial Valley College, College of the Desert, Mt. San Jacinto College, Palo Verde College, and Arizona Western College. These are public community colleges offering the first two years ( 60 units) of college work.

A schedule of classes, with instructions for registration, is published each semester and can be obtained on request from the Director approximately six weeks before the dates of registration. All tests required for the programs offered at this campus are given there.
This campus has a limited experimental student exchange with the two Mexican higher educational institutions in Mexicali, Baja California. Qualified students may be selected to attend classes for elective credit at either CETYS or Universidad Autonoma de Baja California.

## Registration and Commencement

Registration for all classes offered at Imperial Valley Campus is held at the beginning of each semester (Fall, Spring, and Summer) at the Calexico Campus. Students who are continuing, or have been admitted or readmitted by the college, will be mailed detailed instructions for registration. Any student who is not a continuing student (i.e., was not officially enrolled the previous semester, fall to spring or spring to fall, or is seeking admission after having attended another college) must file the appropriate application for admission forms with the Director's

office at Calexico. Students in previous attendance at the San Diego Campus should notify both the Director's office and the Registrar's office of their intention to enroll for courses at Calexico.

Commencement exercises are held once a year in Calexico at the end of the spring semester. Those students who were graduated at midyear, plus those graduating at the end of the spring semester, and students who expect to complete requirements for graduation in the summer session are encouraged to attend.

## Physical Facilities: Offices, Classrooms, Student

## Union, Bookstore, Library

The campus consists of a cluster of four large buildings set in a six acre landscaped area in the center of the city of Calexico. The buildings are of early traditional Spanish architecture, with thick plastered walls and red tiled roofs.
The administration offices are located to the east of the central building. Classrooms are located in all buildings on the campus. All are large, comfortable, and equipped with refrigerated or heated air conditioning to fit the season. All resident faculty members maintain offices on campus.
Facilities are provided for student use in the student union consisting of a building entirely separated from the office and classroom areas. The building is furnished with television, sofas, lounge chairs, small tables, and easily movable chairs and can be used for conferences and meetings. Snack facilities are also available to students. The Associated Student Body Offices are located in the administration office building.
Books and other materials may be purchased at the start of each semester at the campus bookstore. In addition to class textbooks, paperback books on a variety of topics and supplies are available to students.
The Imperial Valley Campus library is housed in the south wing of a three building complex. It contains over 20,000 books, 2,500 pamphlets, and 200 periodicals. Stacks are separated from the study-reference area. Additional loan privileges are available to students and faculty through the library at the San Diego Campus and the Southeastern California area public and school district libraries. Books and reference materials are also available from the two Mexican collegiate institutions located in Mexicali, Baja California, Mexico.
A basic collection of audio-visual equipment is available for classroom use. Films and other instruction materials are available to the staff and students through the Audio-Visual Departments of the San Diego Campus and of the Imperial County Education Center. Films are also rented from outside sources as needed.

## Placement, Employment, and Information

The college provides a centralized placement service in cooperation with the School of Education. Students are aided in securing part-time and full-time positions and in obtaining information concerning occupational trends. Staff members maintain contact with schools for teacher
placement. Present conditions result in more elementary teaching position vacancies than the campus has graduates.
Further information on admission, registration, programs, and classes may be obtained by writing the Director, Imperial Valley Campus, San Diego State, 720 Heber Avenue, Calexico, CA 92231, or calling $357-$ 3721.

## San Diego State

San Diego State began in 1897 as a two-year normal school housed on the second floor of a downtown office building. That first year it had a faculty of seven and an enrollment of 91. Soon thereafter it moved to its own campus at Park Avenue and El Cajon Boulevard. It occupied these quarters until 1931 becoming meanwhile in 1931 a four-year teachers' college under the State Board of Education.

By 1931 it had grown beyond its facilities and moved to a new campus in what was then the far eastern outskirts of the city. What are now Arts and Sciences, the Women's Gymnasium, the Power Plant, and the central parts of the (old) library, Life Sciences, Speech, and Physical Sciences were the original buildings, erected in Spanish mission style with arches, an open-faced bell tower, covered walks, thick concrete walls, and red tile roofs. The motif of the architecture has been preserved in the new buildings so that the campus has unity.

In 1935, the college dropped "Teachers'" from its title and in 1960, it became part of the California State College system with a state-wide Board of Trustees and a chancellor. Because of its varied offerings both undergraduate and graduate, its professional schools, its accreditation, its fine library, and its distinguished faculty of over 1500 members, $68 \%$ of whom have the doctorate, many friends of San Diego State consider it of university caliber.
In recent years many new buildings of modern design have been added. Especially well equipped and spacious are Business Administration and Mathematics, Chemistry-Geology, Dramatic Arts, Engineering, Fine Arts, Home Economics, Industrial Arts, Life Sciences, the Malcolm A. Love Library, Music, Physics, Social Sciences, and gymnasiums for men and women. In addition, dining facilities, the student store, the student recreation center, and a large outdoor auditorium in the form of a Greek amphitheatre are all noteworthy. Two heated pools are available for year-round swimming, when school is in session.

The present site consists of 300 acres on the south mesa above Mission Valley, eleven miles from the Pacific Ocean. On crisp days, the forested Laguna ridge to the east and the high ground of Point Loma to the west are visible.
The natural sciences are housed in a $\$ 25$ million complex of fully equipped laboratory buildings on the northeast rim of the campus plateau. Astronomy is served by observatories on campus and in the nearby 6,000 -foot-high Laguna Mountains. The university operates a computer center, seismology and weather stations, and two wind tunnels. Two biology field stations (one of 2500 acres) are maintained in forest and chaparral country. Specially designed laboratories also serve students in foreign languages, international relations, and public administration, as well as in the natural sciences.

## Malcolm A. Love Library

A large new central library, named in honor of San Diego State's fourth president, was opened to the students and faculty scholars early in 1971. It provides ideal facilities for study and research. At the heart of the expanding campus, it is readily accessible from all directions. The five-floor building seats 3,700 readers and has an ultimate volume capacity of a million.
Its structure, contemporary in design, has a direct and simple impact on the viewer, free as it is of clutter. Because of the view through the large tinted glass windows enclosing the library on all sides, one is conscious that he is at the focus of the campus. The unusual arched coutdoor pillars are repeated indoors, giving one a sense of continuity outdoor pillars are
with nature. Generously carpeted and adorned with quality paneling, the library invites study and reflection.
The library's resources and services are noteworthy. Major services provided are: a central reference room, a specialized lower division library, a special collections room for rare books and archives, and areas for documents, educational resources, current periodicals, and microforms. It has a listening room for phonorecords.
Its collection is substantial. It has 700,000 volumes, including books, bound periodicals, and government documents. Additional resources include: 600,000 microcards, 200,000 microfiches, 20,000 reels of microfilm, 30,000 college catalogs, 50,000 curriculum materials, 22,000 scientific reports, 180,000 archival papers and manuscripts, and many other information media including phonorecords, sound tapes, prints, maps, pamphlets, and other graphic items.
The library receives 8,300 periodical and other serial titles excluding government documents. It is a depository for United States, California, Illinois, New York, and Texas government publications. It receives all United Nations and Organization of American States publications, and those of other national and international bodies.
Highly trained reference librarians assist students and faculty in their reading, study, and research. To aid the student in developing his powers in critical, independent thought through wide acquaintance with books, the library has an open shelf arrangement which gives direct access to nearly all books. Inexpensive copying machines are available throughout the building.
Several research centers on campus have collections not included in the library's holdings. Among them are: Public Administration and Urban Studies Laboratory, 50,000 items; Economics Research Center, 32,000 items; Geography and Geology Departments, 90,000 maps; International Relations Research Center, 14,000 items.

## Accreditation

San Diego State is a member of the following educational associations:
American Association of Colleges for Teacher Education
American Association of Collegiate Schools of Business
American Dietetic Association

Council of Graduate Schools in the United States
Council on Social Work Education
Engineers' Council for Professional Development
National Association of Schools of Music
National League for Nursing
Western Association of Graduate Schools
Western Association of Schools and Colleges
Through membership in these associations, San Diego State is fully accredited. It is also accredited by the National Council for Accreditation of Teacher Education and by the California State Board of Education. It is on the approved list of the American Chemical Society and is approved by the Veterans Administration.

The university has four professional schools: business administration, education, engineering, and social work. See the descriptions of their programs in the section, Professional Schools. In addition, it provides high quality preparation for many other professions, among which might be mentioned: actor, artist, author, biologist, chemist, coach, dietician, geographer, geologist, journalist, linguist, mathematician, medical technologist, musician, nurse, philosopher, physicist, pilot, psychologist, public administrator, recreation leader, speech pathologist, stage designer, and zoologist. It offers the bachelor's degree in 64 areas, the master's degree in 48 areas, and three Ph.D.'s. Some of its recent noteworthy innovative programs are in Afro-American studies, Asian studies, ecology, Jewish studies, Mexican-American studies, religious studies, and women's studies.

## Summer Sessions and Extension Courses

San Diego State conducts two summer sessions which offer credit applicable to graduation and residence requirements.
During the six-week Term I Summer Session, six units of academic credit may be earned; during the three-week Term II Summer Session, three units may be earned. The tuition for the summer sessions is based upon the cost per semester unit. Write to the Dean of Summer Sessions for information concerning course offerings, special workshops, and requirements for admission. The Summer Sessions Bulletin is available about the first of April and is mailed free of charge upon request.
In order more adequately to serve the educational needs of the community, San Diego State cooperates with off-campus organizations and groups in arranging extension classes in response to expressed needs when the enrollment is sufficiently large to finance the instruction. Offerings are made each semester in a number of departments including education, business administration, and the arts and sciences. Classes may be organized at various locations within San Diego, Riverside, and Imperial Counties. A minimum of 16 to 20 students is usually required in order to maintain a class. The usual class carries three units of credit and meets once a week, either in the late afternoon or evening. These
courses are listed in a special Bulletin of Extension Courses published each semester.
For limitations on extension credit, see the section of this catalog on Credit for Extension Courses. Refer to the index for page number. For information on organization of classes, current offerings, and eligibility for registration, communicate with the Extended Services Office.

## Graduate Division

All graduate work leading to advanced degrees is under the jurisdiction of the Graduate Division and responsibility for all graduate curricula is delegated to a Graduate Council under the chairmanship of the Dean of Graduate Studies who also serves as the administrative of ficer of the Graduate Division.
Under the provisions of Section 41001 of the Administrative Code (see the section of this catalog on Admissions), the Graduate Council, through the Graduate Office, admits all students to authorized graduate degree curricula, determines their eligibility to continue in such curricula, and, in the cases of unsatisfactory performance, requires students to withdraw from all graduate curricula.
The Graduate Council is the appropriate college authority for the administration of all matters related to graduate degree curricula, requirements for which are specified in Section 40504 of the Administrative Code.
All master's degrees are conferred by the Trustees of the California State Colleges upon recommendation of the faculty of San Diego State. These degrees are designed to provide instruction for graduate students in the liberal arts and sciences, in applied fields, and in the professions, including the teaching profession.

Joint doctorates are awarded by the Board of Regents of the University of California and the Board of Trustees of the California State Colleges in the names of San Diego State and the cooperating campus of the University.

## Honors Program

The Honors Program at San Diego State provides opportunities for superior students to use and develop their talents in a variety of ways, both all-college and departmental.

Those who have taken the Advanced Placement Examinations should refer to the section of the catalog so titled:
Prior to entrance, freshmen who have superior high school records may, on the basis of their college aptitude test scores, be invited to participate in a special advising program. Here attention is given to individual needs and interests. Students in this program are given Honors at Entrance. Later, as sophomores, such students are eligible for the Honors Colloquium (Humanities 66).
Some departments offer Honors sections of selected courses. Normally, admission is by invitation, but any student interested should consult the Class Schedule for the name of the faculty member in charge
and consult with him to establish eligibility. Currently honors sections are offered in English 5, 6; Mathematics 50, 51, 52; Physics 4A-4B-4C; Political Science 1, 2; and Psychology 1, 167A-167B. Chemistry 10A10 B is an honors course.

Upon completion of the sophomore year a student who has maintained a superior scholastic record may be eligible for admission to the upper division Honors Program of his major department. Specific requirements and details of these programs vary with the different departments. To apply, a student should consult his major adviser or the chairman of his major department.
The purpose of the San Diego State Honors Program is, within practicable limits, to meet the individual needs of the most capable students. Credit by examination, release from regular attendance, modification of curriculum requirements in the major and minor, and individual study are other opportunities available with the consent of the major adviser or other authorities. See also the section of this catalog titled "Graduation with Honors."

## International Programs

The California State Colleges offer programs of study for a full academic year at a number of distinguished universities abroad, Students study and live under the same conditions as students at the cooperating universities, but remain enrolled in the California State Colleges, where they may apply their work toward degree requirements in accordance with college regulations. The programs, which are voluntary, cooperative and systemwide in nature, are designed as bona fide academic undertakings with clearly defined educational and professional objectives.
For 1970-71 the cooperating universities are: University of the Andes, Bogota, Colombia; University of Aix-Marseille, France; Free University of Berlin and University of Heidelberg, Germany; University of Ghana; The Hebrew University of Jerusalem and Tel Aviv University, Israel; University of Florence, Italy; Waseda University, Tokyo, Japan; University of Granada and University of Madrid, Spain; University of Stockholm and University of Uppsala, Sweden; National University, Taiwan.
Students are selected on the basis of academic, linguistic and personal qualifications. The criteria are:
a) Upper division or graduate standing by the beginning of the academic year abroad;
b) Academic achievement;
c) Proficiency in the language of instruction;
d) Faculty recommendations.

Programs in Ghana, Israel, Italy, Japan, Sweden, and Taiwan do not require previous linguistic preparation; applicants for all other programs must demonstrate adequate facility in the language of instruction at the host university.

Cost to the student covering round trip transportation from San Franranges from and board for the academic year, and medical insurance ranges from $\$ 2,000$ to $\$ 2,500$, depending upon the specific country.
Application should be made early in the fall Application should be made early in the fall.
Detailed information may be obtained from the Dean of the College California State Colleges, 1600 Director, International Programs, The $94132 . \quad 1600$ Holloway Avenue, San Francisco, Ca

## Research Bureaus

## Asian Studies <br> Alvin D. Coox, Director

The Center for Asian Studies is an interdisciplinary organization in the College of Arts and Letters. Drawing upon faculty members from grants and other support for services as (1) securing and administering (2) coordinating and publicizearch and development in Asian Studies Asian-centered Studies; (3) developing activities of faculty engaged in Studies Program and relevant curricula and administering the Asian ate level; (4) responding to campus and comdergraduate and graduformation and services; (5) fostering and community requests for in in Asian Studies

## Business and Economic Research <br> James W. Walker, Director

The Bureau of Business and Economic Resear
search activity serving the needs of the Scearch is an organized re tion. Operationally, it is a part of the School of Business Administration, with a director and staff. Fiscal matters of Business Administrathe San Diego State Foundation.

The principal objectives of the
in the areas of economics and business, wire to (1) conduct research and regional problems; (2) facilitate rese special reference to local faculty and students; (3) seek cooperative arrangemese areas by the individuals and organizations for conducting arrangements with outside (4) analyze and interpret local and regional dpecific research projects; of its investigations and aid the faculty in publication (5) publish the results
Graduate students and faculty are encouraged to make their research. facilities. The bureau is a member of the Associatike use of bureau Business and Economic Research.

## Counselor Education Emery J. Cummins, Director

The Center for the Study of Counselor Education is an interdiscipli nary task force under the administrative jurisdiction of interdiscipli-

Education; fiscal matters are coordinated through the San Diego State Foundation. The Center is designed to draw together faculty members from relevant disciplines such as anthropology, economics, education, psychology, social welfare, social work, sociology, and the college counseling center for such purposes as (1) securing and administering grants and other support for research and development in counselor education and guidance and (2) conducting programs or rendering services related to counselor education and guidance through contractual agreements with public or private agencies or organizations

## Economic Education Joseph McClintic, Director

The Center for Economic Education works with the public schools to promote better economic education. The functions include (1) research, (2) the development, evaluation, collection, and dissemination of appropriate materials, (3) in-service and pre-service instruction, and (4) service. The development of more effective strategies and the evaluation of teaching at all levels is involved.

## Economics Research

Arthur E. Kartman, Coordinator
The Economics Research Center collects research materials, and publishes occasional monographs. The research facilities are available to advanced students for their research reports and to faculty members in economics, and in other fields, for the purpose of aiding research projects. The regular faculty senninars of the Economics Department, meetings of the local chapter of Omicron Delta Epsilon, and special economics conferences are held in this Center.

## Educational Services and Research <br> David H. Ford, Coordinator

The Bureau of Education Services and Research operates within the School of Education. The objective of the bureau is to improve the quality of education through research by (1) assisting with research activities of individual faculty members who wish to make use of its services, (2) cooperating in community and service studies, (3) serving faculty graduate advisers as a resource in research design and statistical techniques, and (4) engaging in the dissemination of educational research information.

## Labor Economics

## Adam Gifford, Coordinator

The Institute of Labor Economics is an activity of the Economics Department with its administration under a director. The Institute, located with the Economics Research Center in SS-338, provides materials
and direction for research in labor problems, collective bargaining, labor legislation, and social security.

## Latin American Studies <br> Philip F. Flemion, Director

The Center for Latin American Studies seeks to encourage teaching and research related to Latin America. It has primary responsibility for the administration of the Latin American undergraduate and graduate degrees and the Mexican Summer School programs. The center sponsors a Latin American Lecture Series which provides the campus with public lectures given by guest speakers and members of the San Diego State faculty who discuss a variety of Latin American topics. The center also assists in the development of the university library's Latin American holdings and has created a special collection of Latin American materials.

## Marine Sciences <br> Glenn A. Flittner, Director

The Bureau of Marine Sciences has been established to facilitate interdisciplinary education and research activity in the Marine Sciences at San Diego State. The Bureau is administered by a director, and operated under the guidance of a Faculty Committee. Fiscal operation is coordinated through the San Diego State Foundation.

> Paleobiology Council
> Jason A. Lillegraven, Chairman

An interdisciplinary research and teaching agency to explore the
fossil record.

## Public and Urban Affairs <br> W. Richard Bigger, Director

The Institute of Public and Urban Affairs is an agency of San Diego State, organized to conduct research into community and of Savernmental
problems. It also sponsors institutes and nity and governmental activities. It is staffed by belated to commuulty of San Diego State. Closely associated with members of the facPublic Administration Center with a specialized with the institute is the of research materials. The institute engages in coopewing collection research efforts with the various departments in cooperative or joint and research centers of the university.

## Public Economics <br> George Babilot, Director

The Center for Public Economics is a facility of the Department of Economics to encourage research by students and faculty in all phases of non-market economic decision-making, encompassing the following
areas: (1) the functioning of federal, state, and local fiscal systems, including the provision for and financing of public goods at each level; (2) the economic factors involved in environmental changes, in particular, their bearing on urban and local economic problems; (3) the economic dimensions of social decision-making. The center is designed to complement the curricular and degree programs in the Department of Economics and to be of service to related disciplines. It maintains research materials and facilities to assist research and publications in the area of public economics.

## Research in Economic Development <br> Murugappa C. Madhavan, Director

The Center for Research in Economic Development is part of the Economics Department's effort to encourage research by students as part of their education and by the faculty. The Center, temporarily located in the Economics Research Center in SS-340, provides material and aid for research in problems related to less developed countries.

## Social Research <br> Aubrey Wendling, Director

The Social Research Center is a facility of the Department of Sociology. It provides physical equipment and space for the planning and processing of sociological research in such areas of investigation as urban growth and development, demographic factors, and social surveys. Current plans include expansion of the center to include laboratories for experimental studies of social organization. The center is administered for the Department of Sociology by a director and an assistant director, whose duties include consulting assistance in the designing and execution of studies and in the preparation of proposals to funding agencies.

## Survey Research Oscar Kaplan, Director

The Center for Survey Research has been established to encourage nonprofit research in the sample survey field. The Center is prepared to undertake surveys requested by government or nongovernment organizations, and to do field work on a local, state, or national basis. Faculty members who wish to submit applications for off-campus support in survey research in the name of the Center may do so, upon approval of the project by the Center's Advisory Committee. The Center is administered by a Director.

## Computer Center

The Computer Center is established to encourage and support the use of computers in all instructional, research and administrative activities of San Diego State. The Center is a cooperative venture by the San

Diego State Foundation, Aztec Shops and the College. The present equipment includes a medium size electronic digital computer-an IBM 360 Model 40 with 131,072 bytes of core storage, disks, tapes, a card reader, a card reader-punch, and a printer. The supervisor is the Disk Operating System which supports the Assembler, COBOL, FORTRAN, PL/I and RPG languages. Remote job entry terminals are located in two buildings on campus. These terminals, consisting of a card reader and printer, are connected to the main computer in the Computer Center via telephone lines. A smaller digital computer, an IBM 1130 , supports the APL and FORTRAN languages and has a plotting capability. Additional facilities include all necessary peripheral equipment to permit computer operation in the fields of scientific computation and commercial data processing. Programming and data processing courses, and courses related to some specialized applications of computers are offered by several departments at San Diego State.

## Research and Project Administration

Research in all academic areas is carried on at San Diego State, consistent with the Master Plan of Higher Education. San Diego State also actively engages in projects such as federal educational contracts and institutes (both on the campus and in foreign countries) as well as other projects related to community and national goals. All research and project activities at San Diego State are administered through the San Diego State Foundation. Under general policies set down by San Diego State administration, San Diego State has attempted successfully to maintain the balance, as envisioned in the Master Plan, between teaching and research, each supplementing the other.

## Audio-Visual Center

The Center provides: (1) student operators to handle all types of A-V equipment for the instructional staff; (2) a comprehensive library of motion pictures, filmstrips, and tape recordings; (3) facilities for cies; (4) a pool of audio-visual cies; (4) a pool of audio-visual equipment for use by individual instruc-
tors. In addition, complete photographic, services are available for photographic, graphic and audio recording sional staff of media specialists is available for consultus. A profespurchases, production, and appropriate instructional urition regarding

## Admission and Registration

Requirements for admission to San Diego State, as to all the California State Colleges, are in accordance with Title 5, Chapter 5, Subchapter 2 of the California Administrative Code as amended by the Trustees. A prospective applicant who is unsure of his status under the requirements is encouraged to consult the counselor at his school or college, or the admissions officer at a state college.
The prospective student should first secure from the Dean of Admissions and Records and fill out completely the following official forms: application form, accompanied by a $\$ 20$ check or money order made out to San Diego State, a health history record, and a residency statement. A letter from an applicant indicating that he wishes to enroll does not suffice as an application. He must file the official forms. He may file only one application for any one term within the California State College system. The application should be obtained from, and filed with, the state college of his first choice. Second, third, and fourth choice campuses should be listed on the application.

## Filing Periods

Depending on the semester or quarter in which he wishes to enroll, he should file his application within the periods as specified:

$$
\text { Initial Filing Period } \quad \text { Late Filing Period }
$$

Summer Quarter 1972 Jan. 3-31, 1972
Feb. 1-April 28, 1972
(or earlier if quotas are filled)
Fall Semester $1972 \quad$ Nov. 1-30, 1971 Dec. 1-June 30, 1972 (or earlier if quotas are filled)
Fall Quarter 1972 Nov. 1-30, 1971

Winter Quarter 1973 _._June 1-30, 1972 (or earlier if quotas are filled) July 3-Oct. 13, 1972 (or earlier if quotas are filled) Spring Semester 1973 __Aug. 1-31, 1972 Sept. 1-Nov. 30, 1972 (or earlier if quotas are filled) Spring Quarter 1973 Aug. 1-31, 1971 Sept. 1, 1972-Jan. 31, 1973 (or earlier if quotas are filled)
San Diego State is on the semester system. Consult the catalog section, The California State Colleges, for information about the other state colleges.
All applications received during the initial filing period will receive equal consideration within the colleges' established enrollment categories and quotas, irrespective of the time and date they are received.
Applicants who can be accommodated within enrollment quotas will receive confirmation of space reservation. Although the space reservation is not a statement of admission, it is a commitment on the part of the college to admit a student once eligibility has been determined. When the student receives notice of the space reservation, he should initiate action to have transcripts of any college and high school work sent to the state college where space has been reserved. The college will
inform him of the number of copies of transcripts required, dates for submittal, and where they should be sent. The student should not have his transcripts sent until requested to do so by the state college where space has been reserved for him.
Applications of students who cannot be accommodated at their first choice college will automatically be forwarded to their second choice on they cannot be accommodated there, to their third choice, and would be faced consideration may be given to qualified applicants who would be faced with an extreme hardship if not admitted. Such applicants should consult the Dean of Admissions and Records.
eriod will eges not filling enrollment categories during the initial filing quotas are filled. Enrollment prioritations during the late period until granted in chronological order of applicith with the last period will be

It is unnecessary to apply in application receipt by the colleges.
the applicant time and is more convenient for the aplication by mail saves

## Filing of Records

File Official Transcripts. The applicant must file the following oft transcripts with the Admissions Office:
(1) Transcript fron lis
(not required of the graduate graduation or last in attendance degree from an accredited institutiont who holds a bachelor's dent who holds a bachelor's degree from a required of the stutution).
(2) Transcripts from EACH college attended insticorrespondence, summer session, or evening (including extension, Graduate students must file transcripts in courses).
to enter the master's degree program.
(3) Photostat or true copy of program.
(or equivalent) if applicant has had active seation form DD-214 required of graduate students.)
An official transcript is one sent directly between schools. The appli-
ant must request the school or college to send the transcript to the Admissions Office, San Diego State. All record the transcript to the by the college become the property of the college transcripts received released nor will copies be made.

## Completion of Required Tests

## Admissions Tests

(1) College Aptitude Test. The American College Test (ACT) or the Scholastic Aptitude Test (SAT) is required for matriculation of entering freshmen and transfer students with less than 60 units. Applicants should consult the high school counselor
for dates and places where tests are given.

college believes his promise of academic success is equivalent to that of eligible California high school graduates.
High School Students. A student still enrolled in high school will be considered for enrollment in certain special programs if he is recommended by his principal and his preparation is equivalent to that required of eligible California high school graduates. Such admission is only for a given program and does not constitute the right to continued enrollment.
Recommended Preparation. Overall, excellence of performance in high school subjects and evidence of academic potential provide the basis for admission at San Diego State. While no specific course pattern is required, to prepare himself properly for a full program of university studies, the applicant is urged to include the following subjects in his high school career: college preparatory English (four years), foreign language (three or four years in the same language), college preparatory mathematics (algebra and geometry for all, two additional years for prospective science majors), college preparatory science with laboratory (one year of a life science, one year of chemistry, and a year of physics), a year of United States history, a year of senior civics, and a third year in the general area of social studies. In addition, the student should take classes in speech, music, art, and other subjects contributing to a general academic background. Prospective science majors should acquire skill in the use of the slide rule and in mechanical drawing. All students would find the ability to type useful in college.

## Admission of Undergraduate Transfers

Applicants for admission to San Diego State as undergraduate transfer students must qualify under one of the provisions specified below.
Applicants with 60 or more semester units. An applicant who has if he has achieved more semester units or the equivalent will be admitted if he has achieved a grade point average of 2.0 (C) on all college work attempted and was in good standing at the last college attended. Nonresident applicants must have earned a grade point average of 2.4
$(\mathrm{C}+)$ or more.
Applicants with fewer than 60 semester units. An applicant who has completed fewer than 60 semester units or the equivalent may be adcurrently in effect for first-time freshents and he meets requirements currently in effect for first-time freshmen. If he has been in full-time he is eligible if he meets the requirements in effect for first-time school, men at the time of his high school graduation. He too must time freshor ACT scores.

An applicant whose education has been in a language other than English must take the Test of English as a Foreign Language (TOEFL). This test is administered in most foreign countries and test scores must be received by the college before admission to the college can be granted. Information as to the time and place at which this test is given may be obtained by writing to: Educational Testing Service (TOEFL), Princeton, New Jersey, 08540, U.S.A. Upon arrival at San Diego State, a further test of English will be given for the purpose of placing students in an English language program commensurate with their linguistic ability in English, and for use by advisers to assist students in planning an appropriate course of study. All students, undergraduates and graduate, are required to take one or more of the following courses, depending upon performance on the placement test: English 1X, English 1Y, English 5. These English courses must be taken in consecutive semesters, with first required course being taken during the student's first semester at San Diego State. Foreign students transferring from another U.S. college may be required to take an English placement test.
Arrangements for housing should be completed before the student's arrival on the campus. Detailed information regarding housing may be obtained from the Director of Housing, San Diego State. Scholarship aid for entering students is limited; no scholarships are specifically reserved for students from another country. Further information regarding scholarships will be found elsewhere in this catalog.
Upon arrival at San Diego State the student should obtain an appointment as early as possible with the Coordinator of Foreign Student Admissions.

## Limitation of Enrollment

Admission to a state college must be restricted in relation to the number of students for whom an adequate college education can be provided by the staff and facilities available. The Trustees have authority on the matter.

## Registration

Students who receive notice that they are eligible for admission to San Diego State must complete additional requirements for registration, such as clearance of residency status, payment of fees, and the keeping of other designated appointments as outlined in the Class Schedule, a publication issued prior to the beginning of each semester and sold at the campus bookstore.


## Residency Status Clearance

The laws of the State of California require this college to determine the residency status of each student enrolling prior to the payment of fees and tuition (if required).
Tuition is free to every student who has been a legal resident of the State of California for a period of one year immediately preceding the residence determination date announced by the Board of Trustees. Every student who has not been a legal resident of the State for said period is classified as a nonresident and is subject to payment of a nonresident tuition fee in addition to fees paid by California residents. (Exemption from payment of the nonresident tuition fee may be granted to an unmarried minor whose parent is in the active military service of the United States and is stationed in California on the residerice determination date of the semester during which the minor proposes to enroll.)
Residence is acquired through the combination of physical presence in California together with the intention of remaining in the state. As a general rule, the residence of an unmarried minor student is determined by the residence of his father. The residence classification of each student is determined in accordance with the California Government Code and the California Education Code.
The attention of the prospective alien student is directed to the fact that he is a nonresident unless, in addition to the general residence requirements for tuition purposes, he has been admitted to the United States for permanent residence in accordance with all applicable laws of the United States. The attention of the prospective student who has not attained the age of twenty-two and whose parents are not California residents and the attention of the Veteran who was not a resident of California at the time of his entrance into the Armed Forces is directed to the fact that presence in California for more than one year does not, of itself, entitle the student to classification as a resident.

The residency classification received by any student is subject to review and change. Every student who is classified as a resident but who becomes a nonresident of California is held responsible for notifying the Residency Office at once. Application for change of classification with respect to a previous semester will not be received under any circumstances.

A person incorrectly classified as a resident student is subject to reclassification as a nonresident if the incorrect classification resulted from concealed facts or untruthful statements made by him. The student then shall be required to pay all tuition fees which would have been charged to him as a nonresident student.

Information concerning the waiver of the nonresident tuition fee for graduate students is available from the office of the Dean of Graduate Studies.

Registration Priority and Advising
Each student is assigned a priority number which determines the order in which he registers and pays fees. The schedule for registration and payment of fees is published in the Class Schedule. Priority numbers appear on the Notice of Admission for entering students, and on the permanent identification cards for students continuing their uninterrupted enrollment in the regular semesters.

Provision is made at the time of registration for each new student to obtain assistance from a faculty adviser in arranging a program. The faculty adviser is assigned at the time of registration. Each student should thereafter schedule a conference with his adviser at least once during each semester.


## Fees and Financial Aid

At the time of registration every student must pay a graduated fee varying with the number of units for which he registers. (Auditors pay the same fees as students taking courses for credit.) The fee per semester is as follows:

| Units | Fees |
| :--- | ---: |
| $0-3.9$ | $\$ 58.50$ |
| $4-7.9$ | 63.50 |
| $8-11.9$ | 68.50 |
| 12 or more | 78.50 |

This fee covers materials and services and includes a student activity fee of $\$ 9.50$, a student union fee of $\$ 7.00$, and a facilities fee of $\$ 3.00$. For fee-paying purposes, zero unit courses count as one unit.

Other fees are as follows:
Administrative

| lateness | $\$ 2$ | Late registration |
| :--- | :--- | :--- |

Application for Lost library book cost
admission
admission 20

Bad check
Change of Program
Damaged equipment

| Lost library book | cost |
| :--- | :--- |
| Organ practice | 10 |
| ROTC deposit | 10 |
| Transcript | 1 |

For a parking permit, the fee is $\$ 13$ for the first car, $\$ 1$ for each additional car used for a car pool, and $\$ 3.25$ for a two-wheeled motor vehicle.
The miscellaneous fees are payable when the service is rendered. The first transcript of record is free; the fee stated applies only to subsequent copies.
In addition to the fees already specified, nonresidents must pay tuition of $\$ 37$ per unit per semester, to a maximum of $\$ 555$ per semester. Foreign visa students enrolling for the first time spring 1971 and thereafter pay this same tuition, but foreign visa students who were enrolled prior to then pay $\$ 20$ per unit per semester to a maximum of $\$ 300$ per semester.
For fees for the summer sesssions and for extension courses, consult the respective bulletins.

All fees and tuition charges are subject to change by the Trustees without prior notice.

## Refunds

If a student withdraws from the university by the beginning of the third week of classes, he may receive a partial refund of the fee for materials and services. Tuition is refundable on a sliding scale, depending on the time of withdrawal. The student begins the process by filling out a withdrawal card at the Registrar's Office.
Some portion of the parking fee can be refunded on a sliding scale up to three months after classes have begun. The student applies for the refund at the security office in the Administration Building, bringing with him his receipt and the remnants of his parking sticker.

## Cost of Living

Each student should plan his budget based on individual needs. The wide range of financial resources of students in a university as large as ours makes it difficult to give specific information on costs. At San Diego State it is possible to live simply and participate moderately in campus life on a modest budget. The following table may serve as a guide.

Estimated Expenses for the Academic Year

| Living on <br> Campus | Commuting |
| :---: | :---: |
| $\$ 157$ | $\$ 157$ |
| 180 | 180 |
| 450 | 360 |
| 1250 | - |
|  | 400 |
| $\overline{\$ 2037}$ | $\underline{\$ 50}$ |
| 1627 |  |

In addition, foreign students and out-of-state students pay an annual tuition of $\$ 1110$. Typical expenses for married students without children average $\$ 3,400$ for a nine-month period.

## Financial Aid

San Diego State makes every effort to see that students who wish to attend are not prevented from doing so because of inadequate resources. Funds available to the college, however, are not unlimited and applications are considered on the basis of greatest financial need. Financial aid in the form of loans, grants, and part-time employment on or off the campus is made available to qualified applicants. In the majority of cases, a student will be offered a package financial aid plan which may include one or more of the types of aid.

In addition to the scholarships granted to students directly by organizations and individuals, the following scholarships are awarded through the Scholarships Committee.

Ackley Scholarship
Alpha Epsilon-Brenda Beitner
Alvin Morrison Memorial
American Business Women's Assoc.
American Society of Military
Comptrollers
American Yugoslav Woman's Club
Amsden Memorial
Baranofsky, Dorothy, Memorial Biehl, Martha S. Memorial Bowman, Mrs. Elton Memorial Brown, Dr. Leslie P.
Burgener, Clair W.
California Congress of Parents \& Teachers
California Society CPA's California State Fireman's Assoc. Cap \& Gown
Cooper, Daniel William
Copley Press
Country Friends
Del Cerro Women's Club
Delta Kappa Gamma
Dorado Foundation
Downtown Optimist Club Ellis, George William, Memorial Executive Secretaries, Inc. Faculty Dames
Fleet Foundation
Fontaine, Amelic Memorial Fontaine, Amelic M
General Dynamics General Dynamics
Jones, Sybil Eliza
Junior Charity League

Kappa Pi
KOGO-TV
La Mesa Dialogue for Action Las Meninas Junior Women's Club Linkletter, Art
Lodge, Catherine Yuhan National Council of Jewish Women Pacific Beach Jr. Women's Club Perry, Fay Van Ness Pfaff, Paul Memorial Phi Alpha Theta Phi Epsilon Phi Pi Lambda Theta Post, Dr. Lauren C. San Diego City Schools Guidance San Diego Gas \& Electric
San Diego State College Alumni San Diego Women's Club-Home and Garden
Senn, Percie Belle
Shields, Robert Patterson, Foundation Sigma Alpha-Gamma Upsilon Chapter Sigma Alpha Iota Alumnae
Silvergate Lions Club
Silverman, Anna \& David
Silverman, Anna \& David
Society of California Accountants
Society of Manufacturing Engineers Solar
Stott, Dorothy C. \& Kenneth W.
Thompson, Terry Lynn, Memorial
Trott, Wilmia Tyler
Whitney, Guilford H., Foundation
Williams, DeWitt Bisbee

## Student Services

## Staff

Activities: Judy Haller, Stephen Ironhill, Bruce Meador, Dorothy Simpson, Gary Solbue
Career planning and placement, and financial aid: Judy Gottlieb Gumbiner, Richard B. Haines, E. Biddle Heg, J. Franklin Jonasson, James Kelly, Nancy Leonard, Jesse Martinez, James R. Murphy, Nancy J. Olsson, Susan E. Ramsey, Nancee B. Williamson

Counseling and testing: Samuel Gange, Jack Graham, David Hostetler, Mary Hubbard, Mike Irwin, Richard Morril, David Nesvig, Donald Neuman, Gwen Onstad, Judy Osgood, Earl Peisner, Herman Roemmich, Steven Sherr, Marguerite Strand
Health service: Mary Bradford, M.D., James Crawford, M.D., James Firoved, M.D., John J. Killion, M.D., Patricia Peterson, M.D., Robert Vinton, M.D., Betty Zak, M.D.; Gertrude Anderson, R.N., Elizabeth Bandt, R.N., Verna Brooks, R.N., Betty Chohan, R.N., Ethel Erickson, R.N., Virginia LeBlanc, R.N., Juanita Lichtenfeld, R.N., Dorothy O'Carroll, R.N., Joan Simcox, R.N., Arlene Thompson, R.N., Frances Woodiwiss, R.N.

## Counseling and Testing

These services are performed in the Student Counseling Office and in the Test Office in the Administration Building. The university makes them available to help students gain the greatest benefit from their college experience. Mature and well trained counselors are available for help in the solution of problems of a personal, social, or occupational nature. In addition, the program of student advising is coordinated in the Counseling Office. Students wishing to set up a special major or who have questions about the undeclared or special major can receive guidance in the Counseling Office.

## Health Service

As a part of the program of student personnel services the college provides health services for the protection and maintenance of student health. These services are administered under the supervision of a medical director-administrator. A full-time physician staff is available to the students when school is in regular session for consultation, treatment of minor physical conditions, emergencies and counsel as to follow-up procedures. Full-time nurses and technologists are also on duty when school is in regular session.
As a part of the admissions procedure a health history is required of all students. On the reverse side of the health history is a physical examination form to be completed as a condition to matriculation in accordance with Title 5, California State Colleges, Paragraph 41200. Careful attention is given to students undergoing private remedial

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Alvin Morrison Memorial
American Business Women's Assoc.
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American Society of Military
American Societ
Comptrollers
American Yugosla
Amsden Memorial
Baranofsky, Don Bichl, Martha S. Memorial Bowman, Mrs. Elton Memorial Brown, Dr. Leslie P.
Burgener, Clair W.
California Congress of Parents \& Teachers
California Society CPA's
California State Fireman's Assoc, Cap \& Gown
Cooper, Daniel William
Copley Press
Country Friends
Del Cerro Women's Club
Delta Kappa Gamma
Dorado Foundation
Downtown Optimist Club Ellis, George William, Memorial Executive Secretaries, Inc.
Faculty Dames
Fleet Foundation
Fontaine, Amelic Memorial
General Dynamics
Jones, Sybil Eliza
Junior Charity League

Kappa Pi
KOGO-TV
La Mesa Dialogue for Action Las Meninas Junior Women's Club Linkletter, Art
Lodge, Catherine Yuhan
National Council of Jewish Women Pacific Beach Jr. Women's Club
Perry, Fay Van Ness
Pfaff, Paul Memorial
Phi Alpha Theta
Phi Epsilon Phi
Pi Lambda Theta
Post, Dr. Lauren C.
San Diego City Schools Guidance San Diego Gas \& Electric
San Diego State College Alumni San Diego Women's Club-Home and Garden
Senn, Percie Belle
Shields, Robert Patterson, Foundation
Sigma Alpha-Gamma Upsilon Chapter
Sigma Alpha Iota Alumnae
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Whitney, Guilford H., Foundation Williams, DeWitt Bisbee

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As a part of the admissions procedure a health history is required of all students. On the reverse side of the health history is a physical examination form to be completed as a condition to matriculation in accordance with Title 5, California State Colleges, Paragraph 41200 . Careful attention is given to students undergoing private remedial
treatment, and those for whom a modified study load or limited participation in physical education activities seems advisable.
A student health insurance program sponsored by the Associated Students is currently in effect. This insurance, which covers hospitalization and specified medical and surgical services, may be purchased by the semester or the year through Aztec Shops, with enrollment open the first thirty days of each semester. Refund will be made to students graduating or dropping out of school on a prorated basis.

## Career Planning and Placement Center

The college provides a centralized placement service in cooperation with the various departments of the college. Undergraduate students are aided in securing part-time and full-time positions and in obtaining information concerning occupational trends. Liaison is maintained with the Personnel Services Center on matters relating to senior vocational counseling. Staff members maintain constant liaison with schools, businesses, and industries. Early in his university career, the student should seek out a counselor at the center appropriate to his academic and vocational goals, and establish a Placement File. Special counselors to serve Chicano and Black students have recently been added to the center staff. The center is located in the College Annex, 5870 Hardy Avenue.

Going to college is regarded as a full-time job. Students are normally expected to spend in class and study a total of three hours per week for each unit of college work attempted. A normal 16 -unit load therefore represents a 48 -hour week. Students are strongly advised to take this into consideration before accepting any part-time job.
When registering for his last semester, the student should fill out an Early Match System data card. With the information he thus provides, the center staff can better assist him in seeking out rewarding and challenging full-time employment.

## Vocational Rehabilitation Services

A student who has a physical or emotional disability which handicaps him vocationally may be eligible for the services of the State Department of Rehabilitation. These services include vocational counseling and guidance, training, and job placement. He may qualify also for financial assistance for educational and medical needs and to meet living expenses.
For further information, students should apply to the department at its district office, 1350 Front Street, San Diego, or call 232-4361

## Study Skills Center

Standard English, free from flagrant errors in grammar and spelling, is required on written assignments throughout the college; moreover, passing of the Writing Competency Test or satisfactory completion of designated courses or remedial programs is a requirement for gradu-
ation.


## Study Skills

To help students attain a reasonable degree of proficiency, the English Department offers several courses in composition, beginning with the freshman year. In addition, the department maintains a Study Skills Center, offering a semitutorial service to those wishing to improve writing or reading ability or to get help with study problems or writing projects, either remedial or advanced. The service is open to all students at any level of college work. If interested, enroll in English R or W , or simply come to the center without registering.

## Audiology Diagnostic Center

The Audiology Diagnostic Center is a facility of the Speech Pathology and Audiology Department with its administration under a director. The center is located on the lower floor of the Education Building, adjacent to Health Services. The principal objectives of the center are: 1) to provide complete diagnostic information regarding the hearing loss for faculty, students, and staff free of charge; 2) to provide the same service to the community for a minimal fee administered through the College Foundation; 3) to provide hearing assessment of all freshmen and transfer students as part of their health examination; and, 4) to foster research in the area of hearing function and pathology. This center operates throughout the school year and in Summer Session I.

## Speech and Hearing Clinic

A speech and hearing clinic in which college students are trained in the application of speech and hearing pathology techniques, speech, lipreading and auditory training and language development for the hard of hearing and deaf, is held throughout the academic school year and in Summer Session I. The clinic admits those with speech and hearing problems, ages three to adult. Because of limitations in staff, not all who apply can be admitted. A minimal fee is charged for diagnostic evaluation and therapy for outpatients but not for students enrolled at San Diego State.

## Clinical Training Center

The Clinical Training Center prepares college students to identify and diagnose children's and young adults' physiological and psychological difficulties, to teach and give remediation, and to test and counsel. Students from the departments of Education, Psychology, Social Work and Speech Pathology and Audiology receive a variety of carefully planned experiences, including an opportunity to work with children and youth under supervision on a one to one ratio or in very small groups. In addition, they take part in frequent staff meetings which utilize the interdisciplinary approach toward solution of children's problems. Meetings with parents of the children with whom they work is a regular function of the training program.

While the primary purpose of the Center is to train teachers and clinicians, a community service is offered to those who have problems with school achievement, speech, hearing, educational and vocational
planning, and school adjustment. Referrals are ordinarily made by schools, other agencies, or individuals. Parents, for example, may make a referral either directly to the Center or through their child's school. In general, preference would be given to the child who might profit best by specialized help and who meets the needs of training college students. There are specific criteria of selection of children for each strand of the total program.

## Student Activities

A rich field of extracurricular activities is available to San Diego State students. The Student Handbook, available at the time of registration, gives information concerning the nature and scope of these opportunities. The Dean of Activities, Mrs. Margery Warmer, and her staff are available to students desiring advice and assistance in planning appropriate participation.
A multitude of opportunities are offered through musical and dramatic performing groups, programs of intercollegiate athletics, newspaper, magazine, radio, television, film, and theater productions. Among the approximately 200 student organizations offering membership are national service, honorary and professional fraternities, recreational, religious, special interest and departmental organizations, national social raternities, and national social sororities.
There are twelve national sororities at San Diego State. Housing accommodations for approximately 300 women are available. in sorority houses. Only one formal rush period is held during an academic year, Rush will be held continues throughout the entire year. Formal Fall wush will be held during the second week of September. Registration with the Panhellenic Office early in August is encouraged. Although certification of admission to the university is not a prerequisite for articipate in the program.

## Aztec Center

San Diego State was the first of the California State Colleges to build and operate a permanent college center. The Aztec Center story started in the mid-1930's when students and faculty began accumulating funds
for construction. In 1956, the Associated Students Counch for construction. In 1956, the Associated Students Council set aside a
permanent portion of the Activities Fee permanent portion of the Activities Fee for the building fund. Students
voted to assess themselves a mandatory fee for the further of the project in 1963. Two years later the U.S. Der further development and Urban Development extended a 40 -year loan of $\$ 0$ of Housing enable construction to begin. The student union of $\$ 2.9$ million to retire this indebtedness; no public tax money is involved be used to ings and equipment were paid for with student involved. The furnishfrom Aztec Shops, Ltd. From inception to the final contributions furnishings, students and faculty have shared alike inalities of interior planning and development. Financed by a student in all phases of its non-profit, self-sustaining, self-liquidating, non-tax union fee, it is a non-profit, self-sustaining, self-liquidating, non-tax supported, student-
financed operation.

## Aztec Center

Use of the center is the privilege of San Diego State students, faculty, staff, alumni, and their guests. It provides a pleasant background for many cultural, social, and recreational activities. Its name reflects its unifying nature: a dynamic, enriching focal point for the social life of members of the campus community.
The 110,000 square foot structure houses a portion of the activities program and includes several lounges, conference rooms, bowling lanes, and space for billiards, table tennis, an information booth, a U.S. Post Office branch, ticket office, lost and found, barber shop, student government center, a snack bar (Monty's Den), and a large hall (Montezuma Hall) for lectures, movies, and concerts.

## Alumni Association

The purpose of the association is to promote interest in the university on the part of alumni, students, faculty, and the general community. Cooperating with student and faculty committees, it participates in Founders' Day, Commencement, and other campus events. It publishes a monthly Alumni News and twice a year El Campanario to distribute news about the university to its members. Membership in the association is open to any former student who was in regular attendance for at least a semester, as well as to past and present members of the faculty. Alumni House, at 5721 Lindo Paseo, is attractively furnished and has a garden area for outdoor events. Alumni are invited to use its facilities.

## Residence Halls

Accommodations for 1668 single students are available in six residence halls on campus. Each of the buildings is fireproof and air-conditioned throughout. Five halls (two for men and three for women) accommodate 209 students each, with sleeping and study facilities on a twostudents per room basis. The sixth residence, which is co-ed, accommodates 623 students with 221 spaces for men. Adequate provision for study hours will be made, as well as an opportunity for participation in campus activities. Student government in each residence, working through the Associated Students of San Diego State, sets standards for basic behavior in these residence halls. Each of the smaller residence halls is staffed by one Head Resident and five Assistants, with two Head Residents and appropriate staff in the larger hall.

Currently, the cost for room, health and accident insurance, and linens is approximately $\$ 250$ to $\$ 345$ per semester. Food service ( 19 meals per week) is available in The Commons on an optional basis.
To apply for housing, the student should ask for an application and deposit $\$ 98$ with the cashier in the Campus Laboratory School. A student may apply as early as a year in advance. Applications are taken in order of date received. Though consideration will be given to a student's request for an individual hall and roommate, he cannot be guaranteed a specific room.

No application can be honored if the student is not accepted for admission into San Diego State by August 18 (January 24, spring semester). Clearing residency is not the same as being fully admitted to the university. Nor does receipt of a housing contract mean that the university is committed to admitting the student. The deposit will be refunded if a student, after having submitted his housing application, is denied admission to the university,

During the Summer Sessions, rooms are available on a receipt-ofcheck date priority. A $\$ 20$ refundable security deposit should accompany a request for reservation.
Adjacent to the campus is a nine-story privately owned and operated coeducational residence hall, approved for SDS students. Room and board are available for over 500 students. For information apply directly to El Conquistador, 5505 Montezuma Road, San Diego.
Information on other off-campus housing may be obtained from the Director of Housing, 5860 Hardy Avenue.

## Transportation and Parking

Bus line transportation to the college, connecting with all areas of the metropolitan area, is available daily, except Sundays and holidays. Route Soperates north-south on College Avenue, between the campus and the College Grove Shopping Center at Ryan Road. Transfer points for connecting east-west bus lines are at El Cajon Boulevard with Route E, at University Avenue with Route 7, and at Streamview Drive with Route 5 . On-campus parking areas are provided for students, faculty and staff. A visitor information booth is located at the entrance to the campus on
Campanile Drive.

## Educational Opportunities Program

This program is designed to assist capable young people from minority or low income groups who wish to acquire a college education but are various EOP offices, high schools, and factors. In cooperation with various EOP offices, high schools, and community organizations, the
program recruits students, helps them program recruits students, helps them enroll, and advises them con-
cerning scholastic and financial through the Financial Aid office according Financial aid is disbursed need.

Through the EOP Supportive Services, counselors for help with personal problems so that each sturs are made available opportunity to reach his fullest potential.

## Veterans

The university maintains an office to serve veterans who are pursuing their higher education at San Diego State. The office staff provide information, help in the establishment of benefits, and seek to facilitate regis-
tration. The service is under the administration sions and Records.

C's in two five-unit classes, he has earned 18 plus 20 grade points or a
total of 38 .
To compute the grade point average, one divides the total number of grade points earned by the number of units attempted. Thus, in the example cited, the student's GPA is 38 divided by 16 or $2.3+$. The minimum GPA for a bachelor's degree or recommendation for transfer to another college is 2.0 (C); in other words the student must have earned at least twice as many grade points as units attempted.

## Auditing

A student who does not wish to take a course for credit may, with the consent of the instructor, enroll as an auditor. An auditor must meet all admissions requirements and pay the same fees required of students taking the course for credit. No change from regular registration to audit, nor from audit to regular registration will be permitted during the semester. An auditor is not held for examinations and does not receive credit or a final grade in the course.

## Repeated Course

A student may repeat a course in which he has received a grade of $D$ or F, but may not receive credit for the course more than once. A repeated course is counted as units attempted and is credited with the grade points earned, the effect being an averaging of the grades. If a student repeats a course in which he has received a grade higher than D , the repeated course will not be counted as units attempted nor will
grade points be counted in the studenter grade points be counted in the student's record.

## Final Examinations and Credit

No final examination shall be given to individual students before the regular time. Any student who finds it impossible to take a final examination on the date scheduled must make arrangements with the instrucfinal examination withine grade reported and must take the deferred grades.

## Credit for Upper Division Courses

## Normally, only juniors, seniors, and

division courses (numbered 100 and graduate students enroll in upper sophomore who demonstrates to the satisfe). However, a freshman or partment that he is qualified may enroll in an of the appropriate dethe instructor consents. He may get upper division division course if addition he secures the approval of the chairman of credit for it if in of the dean of the school or college concerned, and department and of Admissions and Records of their approval. He begins the process
by obtaining a Request for Adjustment of Academic Requirements (a "waiver") form from the Evaluations Office.

## Community College Credit

A maximum of 70 semester units earned in a community college may be applied toward the degree, with the following limitations: (a) No upper division credit may be allowed for courses taken in a community college; (b) no credit may be allowed for professional courses in education taken in a community college, other than an introduction to education course.

## Concurrent Master's Degree Credit

A senior who is within seven units of completing requirements for the bachelor's degree and whose overall grade point average is 3.0 or above may petition the Graduate Council to take approved 100 -numbered courses for concurrent master's degree credit with the remaining requirements for the bachelor's degree. Enrollment in 200-numbered courses is not permitted. The bachelor's degree must be completed at the end of the semester in which the concurrent credit is earned and not more than six units of such credit will be accepted on the minimum unit requirements for the master's degree. (For further information, refer to the Graduate Bulletin.)

## Concurrent Postgraduate Credit

A senior who is within seven units of completing requirements for the bachelor's degree and who has been admitted to teacher education may petition the Dean, School of Education, to take a maximum of 12 units of 100 -numbered courses for concurrent postgraduate credit with remaining requirements for a bachelor's degree to apply toward the minimum unit postgraduate requirements for a teaching credential. The bachelor's degree must be completed at the end of the semester in which the concurrent postgraduate credit is earned. Enrollment in 200numbered courses is not permitted. Extension courses are not acceptable for postgraduate credit.

## Credit for Extension Courses

The maximum amount of extension and correspondence credit which may be accepted toward the minimum requirements for the bachelor's degree is 24 semester units, not more than 12 of which may be transferred from another college or university, except that courses taken through the United States Armed Forces Institute, or other official military correspondence schools, shall not be included within these limits. Extension and correspondence credit do not count in satisfaction of the minimum residence requirement. A maximum of six units in extension courses at San Diego State may be accepted as part of the requirements for the master's degree, subject to limitations described in the Graduate Bulletin.

Students desiring to enroll concurrently in extension courses and in the regular college program are subject to the regulations on excess study load. Such students should obtain approval from the Dean of Admissions in advance of registration.

## Credit by Examination

Approval to receive credit-by-examination is granted at the discretion of the appropriate college authorities and under the following condi(1)
(1) The student must be matriculated, in good standing (not on probation), be registered in at least one regular course (not Extension) at the time credit-by-examination is authorized, and pay for additional units if cost exceeds fees already paid. Application for credit by exam ination must be made within the time limits for filing a change of program as listed in the Academic Calendar each semester. In summer ses-
sions the total units earned for sions the total units earned for courses and examinations can not exceed the limit authorized by the Education Code examinations can not exceed
(2) Concurrent approval of Code.
cerned and the Dean of Undergraduate Studies the department contaking the examination. Forms for appre Studies is required prior to Registrar.
obtained from the courses listed in the genera is restricted to regular undergraduate 300 -numbered, or Extension courses; does not include 200-numbered,
cable to graduation; and does not count exceed 30 units as appli-
(4) Credit-by-examination is not count as residence credit. study load and, therefore, is not considered as part of the student's poses or by the Veterans Administration in fer Selective Service purrespective regulations; and is seldom accepted as application of their collegiate institutions.

## Credit for Advanced Placement and College Level Examination

 to high school students grant advanced placement and advanced credi of the College Entranse who take the Advanced Placement Examinedit of the College Entrance Examination Board prior to the Examination and attain scores of 3,4 , or 5 . A maximum prior to their enrollment no more than three units in any one field of 15 semester units, with examinations upon completion of one semester be awarded for theseHigh school students who intend to particip this institution. should indicate at the time they take the Adripate in this program nations that their test scores be sent to the Advanced Placement Examior advanced placement, the student should university. To obtain credit graduate Studies. San Diego Stat
who have attained a score consider the granting of credit to those students of the General Examinations of the the 25th percentile on each test gram. Scores should be forwarded to the Adege Level Examination Proation.


## Credit for Military Service

The university is guided by the recommendations of the American Council on Education in granting undergraduate, credit toward the bachelor's degree for military service. Postgraduate credit is not granted.
To obtain credit for military service, the student must be fully matriculated and enrolled in the college. The military form DD-214 must be filed with the Admissions Office if military credits are to be counted toward the bachelor's degree or used to shorten the time needed for the degree. This form, or equivalent records verifying active military service in the United States armed forces, should be submitted at the time of applying for admission to the university.

## Student Classification

A matriculated student is one who has complied with all requirements for admission to the university and has received his official Notice of Admission. All students taking courses in any regular semester must be matriculated students. Only in summer sessions or in extension courses may a student who has not matriculated be accepted for enrollment.
Each student who enrolls in one or more summer session classes shall be classified as a summer session student. Each student who enrolls in one or more extension classes shall for his extension class work be classified as an extension class student. Such students need not be matriculated students as a prerequisite for enrollment in classes.
Freshman. A student who has earned a total of fewer than 30 semester units.
Sophomore. A student who has earned a total of 30 to 59 semester units, inclusive.
Junior. A student who has earned a total of 60 to 89 semester units, inclusive.
Senior. A student who has earned a total of 90 semester units or more.
Graduate. A student who has completed a four-year college course with an acceptable baccalaureate degree from an accredited institution. For information on classification of graduate students, see the Graduate Bulletin.

## Student Program and Records

## Transcripts of Record

A student may obtain an official transcript of his record by filing an application at the Registrar's Office. A fee of $\$ 1$ is charged (first copy free). One week should be allowed for the processing and mailing of
the transcript. Transcripts sent from one coll General Regulations sidered as official. Transcripts presented by allege to another are conconsidered to be unofficial and are from other schools or colleges become the property accepted. Transcripts will not be released nor will copies be made.

## Evaluation

An evaluation is a sum
quirements to be completed for a college work completed and of rebe eligible for an evaluation, a student murs degree or credential. To 60 units of acceptable college work and be quave completed at least tion. Authorization for more than and be qualified for full matriculamester or one evaluation in nine weeks of evation during any one sespecial permission of the Board of Admissions summer session requires A student who has earned 60 semester units and Evaluations. official eval evaluation, should apply at the Evar more, who has not at the time the sture evaluation is made on the regus Office for an vided in the California entered this college, excert regulations in effect Election of Regornia Administrative Code, except as otherwise proon Graduat Regulations. (Further information Chapter 5, Section 40401, on Graduation Requirements.)
After an interval of After an interval of five yea
courses in education to be applied toward an evaluation is made, subject to re-evaluation.

## Change of Program After Registration

A change of program after regista Registration
drawal from a class; adding a class; adding indes the following: with for which the student is already radding or reducing units to withsame course.
; changing a section of the Forms for the change of program made or before the published dates Office. A fee of $\$ 1$ is charged for may be obtained at the Red dates. registration. The effective ded for each change of protar Registrar's the date on which the completed withdrawal or change made after student at the Registrar's Office.

Change of Major or Curriculum
At the time of admission to the curriculum is assigned to a major field or curriculege, each un clared major. After registr curriculum, or is undergraduate student major or curriculum, must mate, any student wishing to as an undeVeterans using veteran benef application at the Evato change his from the Veterans Administrefits must obtain appratuations Office. from the Veterans Administration for necessary changes in approvalite
eligibility.

If the student is passing in courses at the time of withdrawal from college, partial credit may be granted in undergraduate courses at the rate of one-third credit for completion of the first six weeks of the to influence the studsert for the first 12 weeks. The college does not wish of fees; however, it should be pointed between partial credit and refund may not satisfy some specific requirement for which credit in a course be needed, and if the course is later repent for which that course may credit will be lost as "repeated" work.
Readmission. A sudent who work.
application for readmission if a full semester the university must file drawal and his return. A $\$ 20$ application elapses between his withquired if the applicant was not regularly enrolled for readmission is resemesters immediately preceding the semester for in either of the two is submitted, or if the student was enrolled for which the application sequent to the last attendance at San Diego State.

## Speech Competency

A Speech Competency Test is given to all entering undergraduate students at the time of registration. Taking the test fulfills the univerin the test will be advised to enroll incy. Students who do not do well 3, Oral Communication Laboratory, or to Pathology and Audiology Completion of the course gives one unit of credit.

## Credit and Study List Limits <br> A unit or credit hour represents

combined with two hours of preparanutes of lecture or recitation semester of 18 weeks. Two hours of activity per week throughout one or three hours of laboratory (as in the sciences) are considered equation)
lent to one hour of lecture lent to one hour of lecture. than $171 / 2$ units. However, beginning with be permitted to enroll for more of classes, a student may exceed this limit Wednesday of the first week outside of college he is strongly advised to though if he is employed program. Going to college is properly a full-time a modest college per week for each unit spend in class and study a tot job. Normally a per week for each unit of college work sttempted. A of three hours

$$
\text { ( } 16 \text {-unit }
$$

Scholastic Probation and Disqualification
An undergraduate student whoses schollifictation
C average (2.0) for all college work attempted record falls below a at San Diego State will be placed on probation all work attempted probation. Probation may be
(n) For purposes of this Article, the following terms are defined
(1) The term "member of the college community" is defined as meaning state college Trustees, academic, non-acadenic and administrative personnel, students, and other persons while such other persons are on state college property or at a state college function.
(A) real or personal property in the possession of, or under the control of, the Board of Trustees of the California State Col
(B) all state operated by a college or by retail, or residence facilities whether zation.
(3) The term "deadly weapons" includes any instrument or the kind commonly known as a blackjack, slung shot, billy, sandclub, of or metal knuckles, any dirk, dagger, switchblade knife, pistol, revolver or any other firearm, any knife having a blade longer than five inches, any oo be used as a club. (4) The term "
1302. Expulsion tehmavior" includes conduct and expression

The President of the state college may place on Students; Fees and Notification. student for one or more of the causes enumerated in Srobation, suspend, or expel a tuition paid by or for such student for the semester Section 41301. No fees or in which he is suspended or expelled shall be refunded. If the student is rer session before the close of the semester, quarter, or summer session in which readmitted pended, no additional tuition or fees shall be required of the student on he is sushis suspension. In the event that a student who has not reached his account of of the action by registered mail to the President shall notify his parent or guardian

Standards and procedures of mined by these regulations.
f a student beli infair or that a professor's a professor's treatment of him is grossly bring his complaint to the proper college clearly unprofessional, he may ing bodies by following the Procedures for Hans and official reviewances Against Members of the Faculty, ador Handling Student GrievA copy of the procedures may be obtained fred by the Faculty Senate. (AD 201).


## Degrees and Programs

## Degrees Available

" A " indicates a degree in applied arts and sciences, " L " in liberal arts and sciences.

Accounting, B.S.
Aerospace Engineering, M.S.
Afro-American Studies, A.B. (L)
$\dagger$ American Studies, A.B. (L), M.A.
Anthropology, A.B. (L), M.A.
Art, A.B. (A, L), M.A.
†Asian Studies, A.B. (L), M.A.
Astronomy, A. B. (A, L), M.
Astronomy, A.B. (A, L), M.S.
Miology, A.B. (A, L), B.S. (A)
Botany, B. S.
Botany, B.S. (A), A.B. (L)
M.B.A., M.S.
$\ddagger$ Chemical Physics, B.S. (A) Chemistry, A.B. (A, L), B.S. (A) M.A., M.S., Ph.D.
tChild Development, B.S. (A)
${ }^{\text {§ City }}$ Planning, M.C.P.
Classics, A.B. (L)
+Comparative Liter
\#Counseling M.
${ }^{5}$ Criminal Justice A
B. S (A), M.S.

Drama, A.B. (A)
**Ecology, Ph.D.
Economics, A.B. (L), M.A.
Education, M.A.
Electrical Engineering, M.S.
Elementary Education, B.E.
Engineering, B.S.
Engish, A.B. (L), M.A.
HEEnvironmental Health, B.S. (A)
*Finance, B.S.
French, A.B. (L), M.A.
**Genetics, Ph.D.
Geography, A.B. (L), M.A.
Geology, B.S. (A), M.S.
German, A.B. (L), M.A.
Health Science, B.S. (A), M.A
History, A.B. (L), M.A.
Home Economics, A.B. (A), M.S
Industrial Arts, A.B. (A), M
"Information Systems, B.S.
-Insurance, B.S.
Journalism, A.B. (L)

Latin American Studies, A.B. (L), M.A.

Linguistics, M.A.
Management, B.S
Marketing, B.S.
Mass Communications, M.S.
Mathematics, A.B. (A, L), M.A.
M.S.

Mechanical Engineering, M.S.
(L)
M.S.
Music, A.B. (L), B.M. (A), M.A

Music, A.B. (L), B.M. (A), M.A.
Nursing, B.S. (A)
Philosophy, A.B. (L), M.A.
Physical Education, A.B. (A),
M.A.

Physical Science(s), A.B. (A),
Physics, B.S. (A), A.B. (L), M.A.,
Political Science, A.B. (L), M.A
Psychology, A.B. (A, L), M.A.,
M.S.

Public Administration, A.B. (A) M.P.A.
$\ddagger \ddagger$ Radio-Television, A.B. (A), B.S (A), M.A.

Recreation Administration, A.B.
(A)

Religious Studies, A.B.
Russian, A.B. (L), M.A
$\dagger$ Russian Area Studies, A.B. (L)
tSocial Science, A.B. (A, L), M.A.
\#\#Social Welfare, A.B. (L)
Social Work, M.S.W., M.S.S.W.
Sociology, A.B. (L), M.A.
Spanish, A.B. (L), M.A.
+Special Major, A.B. (A, L)
$\$ \$$ Speech, A.B. (A) M.A.
Speech Pathology and Audiology,
**Statistics, M.S.
\#Vocational Arts, B.V.E.
Zoology, B.S. (A), A.B. (L)

[^0]section so titled. The Air Force Reserve Officers' Training Corps program, leading to a commission in the United States Air Force as well as to the bachelor's degree, is described in "Aerospace Studies" in the section Courses and Curricula.

## Graduation Requirements

To qualify for graduation with a bachelor's degree from San Diego State, the student must fulfill all of the following requirements.

1. Competency: in mathematics and composition, as demonstrated by tests or by satisfactory completion of designated courses.
Mathematics competency may be demonstrated either by successfully completing Mathematics 3,10B, or 18, or a higher level mathematics course, or by satisfactorily passing the Mathematics Competency Test. Transfer students with 60 units completed take the competency test as a part of their entrance tests. Other students, not planning to take one of the mathematics courses listed above, must take the test at the times listed in the class schedule, published each semester.

Students failing to make a satisfactory score on the test, and not including one of the courses listed above in their degree program, must do individual remedial work, and make a satisfactory score on a second test, which will be administered on an individual basis by the Test Office. Tutorial help is available in the Mathematics Department on a scheduled basis.
The Writing Competency Test may be taken at the first scheduled date for the test following the student's completion of 45 units of college work. All students transferring to this university with 45 units or more of advanced standing credit may take this test before registration. Passing of this test or the retake, which includes the writing of an essay, or satisfactory completion of English W, English 100, or remedial programs prescribed for the student by the College Committee on English fulfills the requirement.
Candidates for the B.E. degree are exempt from this requirement, since special regulations, described under "Education" in the catalog section, Professional Schools, apply to them.
2. Units. For the A.B. degree, a total of 124 units is required; for the B.S. in engineering, a total of 132 ; for all other B.S. degrees, the total is 128 . Of the total, 36 units must be upper division for the B.S. and B.M., 40 for the B.V.E., and for the A.B. in applied arts and sciences, and 45 for the A.B. in liberal arts and sciences. Twenty-four units must be earned in residence at this university, 12 of which must be among the last 20 units ( 24 for the B.E.) applicable to the degree. For the A.B. in liberal arts and sciences, no more than 48 units in one department can apply to the degree. In the School of Business Administration, at least 52 units of the total must be in business and economics, at least 52 outside those areas.
3. Major. Every student must complete a departmental or interdisciplinary major and, if his major calls for it, a minor as well. A major is defined as a required block of upper division courses.
4. Grades. In all courses attempted, in all courses at this university and in all courses in the major, the student must achieve an average
grade of $C$ (2.0).
5. American Institutions. This requirement may be satisfied by any one of the following pairs of courses:

History 17A and 17B;
History 172A and 172B;
History 184A and 184B;
Mexican-American Studies 20A and 20B
Mexican-American Studies 41A and 41B;
Political Science 1 and 2;
Political Science 105 and 115 ;
Political Science 105 and 117 ;
Political Science 105 and 118;
Political Science 115 and 117;
Political Science 115 and 118
Alternatively, this requirement may be met by satisfactory completion of comprehensive examinations in each of the following areas: American history, institutions, and ideals; the United States Constitutainable at the Test Office in local government. A bibliography is obtainable at the Test Office in the Administration Building. The examnations are administered every semester and during Term examisummer.

The requirement may also be met by satisfactory completion of combination of courses and examinations. Relevantory completion of a

## American History

History 8 A and $8 \mathrm{~B} ; 176 \mathrm{~A}$ and $176 \mathrm{~B} ; 177 \mathrm{~A}$ and $177 \mathrm{~B} ; 179 \mathrm{~A}$ and 179 B
81 A and 181 B . .

## U.S. Constitution

History 17A; 172A; 177A and 177B; Political Science 2; 115; 139A
139B.

## California Governmen

History 8B, 17B, 172B, 189B, Political Science 2, 115, 117, 118
6. General Education. A minimum of 40 semeter units 118 . education must be completed. Courses taken in satisf units in general ments for the major and minor may not be counted taction of requireeral education requirement, and not more counted toward the genfor the major may be applied to general education requirements.

## Graduation/General Education

For all bachelor's degrees except the A.B. in liberal arts and sciences, the requirements are as follows:

## A. Natural Sciences

At least two courses (minimum of 6 units) to include at least 1 unit in a laboratory course

1. One course (minimum 2 units) in life sciences-biology, botany, microbiology, or zoology
2. One course (minimum 2 units) in physical sciences-astronomy, chemistry, geology, meteorology, physical geography, physical science, or physics.
3. Electives in any of the above or in oceanography or general psychology.

## B. Social Sciences

1. At least two courses (minimum 3 units for each course) taken in two departments selected from anthropology, economics (except 2), geography (except 1 or 3 ), public administration, or sociology (except 35 or 60 ).
2. Electives in any of the above.
C. Humanities
3. At least two courses (minimum 6 units) taken in two departments selected from comparative literature, religious studies, humanities, philosophy (excluding logic), literature in English or literature in a foreign language.
4. Electives in any of the above or in art, music, drama, semantics, rhetorical theory, or history (western civilization, Asian civilization, or ancient history).
D. Basic Subjects

One course (minimum 2 units) from each of three of the five areas:

1. written communication in English
2. oral communication
3. logic
4. mathematics or statistics
5. foreign language (excluding courses in literature or civilization)
Total units in Parts A, B, C, and D must be not less than 32 units; courses which satisfy the requirement in American Institutions may be counted in the 32 units total but may not apply to the 6 -unit minimum in either Part B or Part C.
E. Physical Activities, minimum of 2 units

A minimum of four semesters of physical activity in courses or equivalent monitored activity, to be fulfilled by

1. Completing four $1 / 2$ unit physical education activity courses over a period of at least four semesters
2. Completing four satisfactory semesters of regular monitored physical activity for credit
3. Combinations of 1 and 2 to give the equivalent of four semesters of physical activity
F. Electives to complete 40 units

Additional units may be elected from the above, from courses specifically excluded above, or from any other courses listed in this catalog.
For students whose A.B. is to be in liberal arts and sciences, the requirements are as follows:
A. Natural Science

Either

1. Seven units

Life science with laboratory
Choose one:

$$
\begin{array}{ll}
\text { Biology } 1 \text { and 2 } & \text { Microbiology } 1 \\
\text { Biology 4 } & \text { Zoology } 8
\end{array}
$$

Physical science with laboratory
Choose one:
Astronomy 1 and 9
Chemistry 1A
Chemistry 2A
Chemistry 10A
Geology 2 and 3
Geology 4
Physical Science 1 and 3
Physical Science 2 and 4
Physical Science 3 and 5
Physics 4A
Physics 2A and 3A
Physics 5
Or
2. Nine units selected from Geography 1 or 3, or any courses in astronomy, biology, botany, chemistry, geology, microbiology oceanography, physical science, physics, zoology. At least units must be in a life science, and at least 3 units must be in a physical science; at least one course must be a laboratory course.
B. Mathematics and Foreign Language

Mathematics 18 or higher numbered mathematics course, or satisfactory performance on the placement examination of the
Department of Mathematics. Department of Mathematics.
Foreign Language-4 units
The requirement may be met by two years of one foreign language in high school
foreign language.
C. Social Sciences

Any two 3 -unit courses in anthropology
(except Geography 1 or 3), political economics, geography

## Graduation/General Education

(except Sociology 35). One of the courses may be MexicanAmerican Studies 50. However, no more than 6 units of Mex-ican-American Studies or political science may be used to fulfill the requirement in social sciences. The two courses must be in different departments. If the entire requirement in American Institutions is met by examination, add another 3-unit course in anthropology, economics, geography (but not Geography 1 or 3), political science, or sociology (except Sociology 35).
D. Humanities and Fine Arts

Either

1. The Scope of Civilization

History 4A-4B or 9A-9B
and
Two courses taken in two departments selected from humanities, literature, philosophy (except logic), or religious studies.
Or
2. The Scope of Civilization

Comparative Literature 52A-52B, or
English 52A-52B, or
Humanities 59A-59B, or
Humanities 150 and 151
and, in a different department,
One additional course (minimum 3 units) in humanities, literature, philosophy (except logic), or religious studies. and
One additional course (minimum 3 units) in art, humanities, literature, music, philosophy (except logic), or religious studies.
E. Other

1. English 5 or 6 or Mexican-American Studies 2B
2. Eight or nine units from any three of the following groups: a. English 5 or 6,
b. Health Science and Safety 21,
c. Mathematics 155 or Philosophy 20,121 , or 122 ,
d. Mexican-American Studies 2A or Speech Communication 3 or 4,
e. Psychology 1
3. Physical Education

A minimum of four semesters of physical activity in courses or equivalent monitored activity, to be fulfilled by:
a. Completing four $1 / 2$-unit physical education activity courses over a period of at least four semesters, or
b. Completing four satisfactory semesters of regular monitored physical activity for credit, or
c. Combination of $a$ and $b$ to give the equivalent of four semesters of physical activity.
The total of 40 units may be reduced by examination on approval by the Dean of Undergraduate Studies and by the chairman of the departto satisfy more than one requirement taken. No course may be used a more than one requirement.
A student who is certified by another collegiate institution as having empleted the General Education-Breadth requirements will be exthat for such completion not morescribed by San Diego State, provided tion to the 40 units applied to fulfillmen 23 units are required in addiBreadth requirements. Of the total of 63 of the General Educationwaived in proportion to that part of 63 units, up to 12 units will be completed in high school or by examinariogn language requirement fulfill all the recommended by examination. If the student cannot should present early in his first sern within the 63 units required, he of Undergraduate Studies, a proposed here, at the office of the Dean approved, this becomes the required plan of courses to be taken. If proposed plan will not excuse the student. Late presentation of the which was possible at the time of admission.

Any student with a minimum of admission
tution, with a declared major, and with 15 average of 3.25 at this insti45 units of college work may submit to the Der more but not over Studies an alternate program, with supporting Dean of Undergraduate general education-breadth requirements, compatible with for fulfilling ments listed below. If approved, the proposed prible with the requirestandard provisions. A student with suroposed program will replace the his option, elect to revert to the standard programed program may, at of his graduation; any student who changes his major shall rect at the time standard program or seek approval of a new proposal.
A. Natural Sciences, minimum of two courses
B. Social Sciences, minimum of two courses
C. Humanities, minimum of two cours
D. Basic Subjects, minimum two courses

For a total of 32 units two courses
E. Electives, maximum of 8
F. Additional requirement, 5 upper division a total of 40 units in the area of the student's major and minor
Within the proposal, no courses in the student
apply to the requirements, and not more than major or minor may to preparation for the major.

Application for Graduation. Grad
completion of requirements. The studention is not automatic take the initiative. Whents. The student who intends to graduate the take the initiative. When he believes that he is eligible, he shoute must

## Graduation

an application with the Evaluations Officer, Administration Building, not later than the end of the third week of classes in the fall if he wants to graduate in midyear, and not later than the end of the eleventh week of classes in the fall if he wants to graduate in June or at the end of a summer session. The Class Schedule each semester specifies the exact date.

## Election of Regulations for Graduation

A student remaining in continuous attendance in regular sessions and continuing on the same curriculum may, for purposes of meeting graduation requirements, elect to meet the graduation requirements in effect either at the time of his entering the curriculum or at the time of his graduation therefrom, except that substitutions for discontinued courses may be authorized or required by the proper authorities.

## Graduation with Honors and Distinction

With the approval of the faculty, graduation with honors is granted to those students in each graduating class who have achieved high grade point averages by the beginning of the fall semester for mid-year graduates and by the end of the fall semester for June and summer session graduates.
The grade point average is computed on work done at this institution, except that if the grade point average for work at other collegiate institutions is lower, those grades are included in the computation.
To be considered for computations relevant to honors or distinction, grades for removal of Incompletes and all other grade changes must be received in the Registrar's Office no later than the end of the fifth week of the semester in which the student plans to graduate and the student must file an application for graduation prior to the published deadline.
Upon recommendation of his major department and with the approval of the faculty, a student doing superior work in his major field may be graduated with distinction in that field.

## Commencement

Commencement exercises are held once a year at the end of the spring semester for students who were graduated at midyear, those graduating at the end of the spring semester, and students who expect to complete requirements for graduation in the summer session. The president of the university, by the authority of the Trustees and on recommendation of the faculty, awards the degrees.

## Second Bachelor's Degree

A second bachelor's degree may be earned if the sțudent has an excess of 24 units beyond the minimum requirements for the first bachelor's degree, makes a complete change in major or degree, fulfills all requirements for the degree as required by this college, and has approval of the Dean of Undergraduate Studies.

3-81517

## Interdisciplinary and Preprofessional Programs

## Africa and the Middle East

See Social Science, below.

## Afro-American Studies

With the A.B. Degree in Liberal Arts and Sciences
Preparation for the major. Sociology 1, English 5, and 12 additional units in courses prerequisite to upper division courses to be taken in the Mal 1 are recommended.
Major. A minimum of 30 upper division units, to be selected from the adviser in Afrom other suitable courses, in a program approved by Comparative Literature 180; Hen studies. Required courses, nine units: selected from the followis; History 183; Sociology 124 or 125; 15 units Music 151D; Political Science 118, 130. So 185; History 173A-173B; Sociology 157, 124 or 125; and 118, 130; Social Welfare 100A-100B; adviser.

Foreign language requirement. Twelve units in a foreign language administered by the foreign languratedge in a reading examination

## American Studies

## In Liberal Arts and Sciences

The major in American Studies is offered by the College of Arts and Letters.

Preparation for the major. History 17A-17B, and English 53A-53B (12 units.)

Major. A minimum of 30 upper division units to include Humanitie 180, History 179A-179B (may be used for group B), and two groups of 9 to 12 upper division units chosen from Group A, Group B groups of C and approved by the adviser.
The remainder of the courses needed to fulfill the 30 unit requp may be taken in courses listed in Groups A, B, C, and D, except that no re than 12 of the 30 units may be taken from any one group that no
Group A: American Litera
138, 139, 198 (when relevant to American Studies). 133, 134, 135, 136,
Group B: American History
173B, $174,175 \mathrm{~A}-175 \mathrm{~B}, 175 \mathrm{C}, 176 \mathrm{~A}-176 \mathrm{~B}, 177 \mathrm{~A}-177 \mathrm{~B}, 172 \mathrm{~A}-172 \mathrm{~B}, 173 \mathrm{~A}-$ 179B, 180 (when relevant to American studies), 181 $178 \mathrm{~A}-178 \mathrm{~B}, 179 \mathrm{~A}-$ 184A-184B.

Group C: Social Sciences. Economics 111A-111B, 135, 138, 173, 174; Geography 121, 155; Political Science 105, 115, 116, 120, 123S, 127A127B, 139A-139B; Sociology 124, 125, 157; Journalism 117, 121.

Group D: Electives. Art 157; Music 151D; Philosophy 164; Anthropology 171.

Foreign Language Requirements. Choice of foreign language should be made in consultation with adviser.

## Asian Studies

With the A.B. Degree in Liberal Arts and Sciences
The major in Asian Studies is offered by the College of Arts and Letters.

Preparation for the major. Six units in History 4A-4B, 9A-9B, or Philosophy 1A-1B; six units in Anthropology 1B-1C, Economics 1A-1B, Geography 1 and 2, or Political Science 1 and 3; and Humanities 59A59B. (18 units.) Art 52A-52B and Comparative Literature 70A-70B are recommended.

Major. A minimum of 30 upper division units to include: From the Humanities not less than 12 units from at least two departments chosen from Comparative Literature 152A, 152B, 170; History 190A, 190B, 191A, 191B, 192, 193, 194, 195, 196A-196B, 197A-197B; Philosophy 135 (when appropriate); Religious Studies 121A-121B, 126A-126B; and from the social sciences not less than 12 units from at least two departments chosen from Anthropology 175, 177, 178, 186; Economics 102, 115; Geography 131, 133, 134, 150; Political Science 183, 187, 191. Recommended: Business Administration 165.

Foreign language. Asian language recommended.

## Child Development

## With the B.S. Degree in Applied Arts and Sciences

Preparation for the major. Anthropology 1A; Home Economics 4A; Home Economics 70 (or Psychology 106 or Education 111 in upper division); Home Economics 35, Social Welfare 30 or Sociology 35; Psychology 50; Sociology 1; Sociology 60 or Psychology 70 (20 units).

Major. A minimum of 36 upper division units to include Psychology 131, and 175 or Education 112; Sociology 135 or Home Economics 135; Education 111 or Psychology 106 (or Home Economics 70 in lower division); Sociology 140 or Psychology 145; Home Economics 171; and Biology 159; and an additional 18 units to be selected with the approval of the adviser, at least 12 and not more than 15 units of which must be in an area in which the student wishes to concentrate.

## Comparative Literature

## With the A.B. Degree in Liberal Arts and Sciences

## Preparation for the major. Comparative Literature 52A-52B.

Major. A minimum of 24 upper division units to include at least 12 units in comparative literature courses, at least six units in a foreign literature (in original language), at least six units to be chosen, with
adviser approval adviser approval, from one of the following: comparative literature courses, foreign literature courses, and courses in related fields.

## Dental Hygiene

See Predental, below.

## European Studies

## With the A.B. Degree in Liberal Arts and Sciences

This major is offered by the College of Arts and Letters.
Preparation for the major. Twenty-two units to include Art 50A or
5B; Economics $1 \mathrm{~A}-1 \mathrm{~B}$, or Geography 50B; Economics 1A-1B, or Geography 1 and 2, or Political Science 1
and 3 ; History $4 \mathrm{~A}-4 \mathrm{~B}$; and 12 units 1 . and 3; History 4A-4B; and 12 units in one of the major European languages (French, German, Italian, Russian, Spanish) beyond the
minimum of four units required in liberal
Major. Thirty upper dived in liberal arts and sciences.
adviser and distributed as follows: six units in Hisen with approval of the Humanities $150 \mathrm{~A}-150 \mathrm{~B}$ or $151 \mathrm{~A}-151 \mathrm{~B}$; six units foreign language; nine units in economics political science; six units in art, comparative edugraphy, history, or literature, music, or philosophy; three units of elecctives, comparative

## Humanities

## In Liberal Arts and Sciences

The Humanities curriculum is offered by the College of Letters.
The intensive program in hats and which gives a comprehensive view of the develos a course of study rary civilization, with practice in critical thevelopment of contemposion. The program encourages extensive reading in thareful expresand philosophy, with oral and written discussion.

## Specific Requirements and Recommendations

I. A major in one of the departments of the College of Arts and Letters, consisting of 24 upper division units and the required introductory courses, plus a minor if required by the major department. Knowledge of one foreign language is required, as specified in the departmental major.
II. Twelve or more upper division units in related fields, selected with approval of the faculty adviser for the curriculum. (May include courses in the minor, if appropriate.)
III. The adviser will assist the student who undertakes this program to distribute his course work among the following areas:
(a) The origins of Western Civilization: Greek and Roman, Hebrew, Medieval.
(b) Western Civilization, 1500-1900; Continental, British, and American.
(c) Contemporary Civilization.
(d) Type courses concerned with more than one period; comparative study of Asian Civilization; linguistics and composition; theory.
IV. Humanities 198, Integration in the Humanities ( 3 units).

The student will file with the Evaluations Office a master plan approved by the adviser for the humanities curriculum.

## Latin American Studies

## With the A.B. Degree in Liberal Arts and Sciences

The major in Latin American Studies is offered by the College of Arts and Letters. The major provides (1) a basis for a more effective understanding of the cultures and governments of the western hemisphere; and (2) a basic education and training for a business or professional career involving understanding of Latin America.
High school students preparing to enter this program should include in the high school course of study not less than three years of study in one foreign language, preferably Spanish or Portuguese. Proficiency in either of these languages is indispensable to a successful career in this area of study.

## Requirements

Preparation for the major. Portuguese 1 and 2; Spanish 1, 2, 3, 4, 10, 11, and 41; 12 units selected from Anthropology 1C, Economics 1A, 1B, Geography 1, History 8A, 8B, Political Science 1, and 3.

Major. A minimum of 36 upper division units to include Spanish $104 \mathrm{~A}-104 \mathrm{~B}, 106 \mathrm{~A}-106 \mathrm{~B}$; and 24 units in social science courses. At least 21 units must be from courses of Latin American content. The student should file with the Evaluations Office-preferably early in his first viser for the Latin Aision work-a master plan approved by the adviser for the Latin American Studies curriculum.

## Predental

The preprofessional programs described here may all be pursued in conjunction with a degree program. The recommended courses listed do not by themselves constitute a bachelor's degree, but they may
serve to fulfill some the dental profession graduation requirements. A student interested in requirements of the specific dinform himself regarding the entrance courses specified by that college. For additional to attend and choose is invited to consult the predental advisers on car guidance, the student
The curriculum for dental hygiene is ars on campus.
dentistry.
Student
zoology with a major in one and a minor in in chemistry, biology and Many dental schools request that linor in another.
cants be prepared by a predental council rather than thation for applifessors. Such a council exists on this cather than by individual proschools have been so informed. In order to cil, it is essential that each applicant provide letters from the couninformation. Obtain the form and provide the council with certain Department of Biology. This form must be submitted the office of the Department of Biology. This form must be submitted to the Biology
Department office by April 1 of the year during which being made.

## \section*{Recommended Course of Study} <br> Fresbman year: Biology 1 and 2, Chemistry

lish 6 or other literature course, Health Scient 1A-1B, English 5, Engmatics 3 and 4, physical education activities, 3. Sophomore year: Biology 15, Chemistry 4 or Speech Communication 21, physical education activities, Physics 1A-1B 4 , and 12, Mathematic Psychology 1, social science (American history, or 2A-2B and 3A-3B U.S. Constitution, California state and loctory, institutions, and ideals, 60. Recommended for the junior year: Art 119A, Biont), and Zoology Chemistry 112, Psychology 106, 107, and various Biology 140, 141, 156, courses.


## Interdisciplinary Programs

## Prelegal

See the first paragraph under Predental.
The following curriculum is designed to meet the requirements of standard American schools of law for a broad and liberal education, while at the same time providing desirable flexibility in the individual programs. There are two patterns of concentration which will usually be indicated for the prelegal student, either of which may be selected, in consultation with the adviser, to fit best the interests of the student. These are the major-minor pattern and the special major pattern. Subject to individual variation, the fields of economics, history, and political science should receive first consideration when choosing the pattern of concentration as being the most effective background for later professional study in law and for possible activities in the field of business.

## Recommended Course of Study

Lower division. Business Administration 1A-1B, Economics 1A-1B, Political Science 1 and 2, and a year course in history. Upper division: In the junior and senior years the student will plan his course with the counsel of his adviser in terms of the field of law in which he plans to work, but keeping in mind the entrance requirements and examinations for admission to schools of law. The recommended list below should receive prime consideration by all prelegal students in the selection of courses, though it is to be thought of as flexible in accordance with student needs.
Recommended: Business Administration 127; Economics 131, 135, 170; History 152A-152B, 175B-175C; Political Science 111A-111B, 138, 139A. Additional: Economics 150, History 179, Political Science 139B.
In addition to the courses taken in the fields of concentration, upper division electives in English, philosophy, psychology, sociology, and speech communication are recommended. A mastery of English is essential. The approval of a prelegal adviser is required for all master plans. If the special major pattern of concentration is chosen, a copy of the master plan is to be filed with the Evaluations Office.

## Premedical

See the first paragraph under Predental.
The completion of entrance requirements for admission to medical colleges requires three years of undergraduate study. However, four years of undergraduate study is usually completed before admission. The premedical student is strongly advised to select a major in a department leading toward an A.B. degree in liberal arts and sciences. This is most readily accomplished by majoring in biology, chemistry, or zoology, although other departmental majors are acceptable. Specific requirements for these majors are described for each department.

High school students planning to enter medicine should include in the high school program the following subjects: elementary algebra, plane geometry, intermediate algebra, chemistry, physics, and two or three years of German or French

## Recommended Course of Study

The following is a list of courses which will satisfy the entrance requirements of most medical colleges. These courses should be included in the program of the premedical student regardless of his selected maand specific raquirequirements for medical colleges differ somewhat wishes to apply should be obtained dical school to which the student For additional information obtained directly from that medical college. viser on campus.

Lower division. Bi
5; six units of English, to include English 5; Biolory 1A-1B and 12, and 4 or man; Physics $1 \mathrm{~A}-1 \mathrm{~B}$, or $2 \mathrm{~A}-2 \mathrm{~B}$ and $3 \mathrm{~A}-3 \mathrm{~B}$; 12 units of French or Ger-

Upper division: Biology 155, 156;
emistry 112. 106.

Preparation for the major. A six-unit sequence in each of three of the following fields: (1) anthropology, (2) economics, (3) geography, (4) history, (5) political science, and (6) sociology. (18 units.) Courses recommended for these sequences are as follows: Anthropology $1 \mathrm{~A}-1 \mathrm{~B}$ or $1 \mathrm{~A}-1 \mathrm{C}$ or $1 \mathrm{~B}-1 \mathrm{C}$, Economics $1 \mathrm{~A}-1 \mathrm{~B}$, Geography 1 and 2, History 4A-4B or 8A-8B, Political Science 1 and 2, Sociology 1 and 10.
Major. Thirty upper division units to include 15 units from any field named above; six units from each of two additional fields named above; and three units of electives from any of the fields named above Courses covering four fields named above, must be completed either in lower division prerequisites or in the major.

## Emphasis in Africa and the Middle East

Preparation for the major. Anthropology 2; Economics 1A-1B; Geography 1; History 4A-4B or Political Science 1. Recommended: Comparative Literature 52A-52B and 80A (15-18 units).

Major. Thirty upper division units from the departments of anthropology, economics, geography, history, political science, and sociology, chosen with the consent of the adviser and including not less than 15 units in any one of the above departments except sociology. Required: Anthropology 185; Economics 119; Geography 125 or 130; History $157 \mathrm{~A}-157 \mathrm{~B}$ or $158 \mathrm{~A}-158 \mathrm{~B}$; Political Science 188, 189, or 192. Additional recommended courses: Anthropology 152, 153, 154, 156, 164, 176, 184; Economics 189, 190, 192, 195; Geography 150; History 155A-155B, 183A-183B; Political Science 176, 191, 192; Sociology 104.
Foreign language. French 1,2, and 3; or German 1,2, and 3; or Portuguese 1,2 , and 3 . An equivalent level of competence in any other language judged appropriate by the Committee on Africa and the Middle East is acceptable. Competence will be determined by examination.

## Special Major

With the A.B. Degree in Applied Arts and Sciences and in Liberal Arts and Sciences

The special major, consisting of three fields, instead of the usual majorminor pattern, offers a general type of education leading to objectives not otherwise provided in the regular programs of the college. Assistance in arranging the special major may be obtained at the Personnel Services Center in the Administration Building. The plan for the major must be cleared with the Evaluations Office for appropriate use of courses, approved by the department chairman in each of the three fields selected, and finally approved by the Dean of Counseling and Testing. Forms are provided for this purpose.

Preparation for the major. A minimum of a year course in each of the three fields selected in the major must be completed in the lower division as foundation for upper division courses.

Major. Thirty-six upper division units chosen from three fields, with not more than 15 nor fewer than nine units from any one field. If two of the three fields selected are from majors offered only in liberal arts and sciences, the special major is governed by the regulations required by that program. If two of the three fields are selected from those not exclusively in the liberal arts and sciences program, the special major is governed by the regulations in applied arts and sciences. The three fields selected are subject to approval by the Dean of Counseling
and Testing.

## Courses and Curricula

## Course Identification

Courses numbered 1 through 99 are lower division courses, intended primarily for freshmen and sophomores; those numbered 100 through 199 are upper division and are intended primarily for juniors and seniors. Those numbered 200 and above are open to graduate students orly. For special circumstances under which lower division students may take upper division courses, see "Credit for Upper Division Courses," under General Regulations, above.
The Arabic numeral following the course indicates the number of units the course carries. A Roman numeral I following the units designation indicates that the course is normally offered in the fall, a II that it is normally offered in the spring, and an S that it is given usually in the summer.
Not all the courses listed here are offered every semester or even each year. The frequency is determined by the department in response to anticipated demand and availability of a qualified faculty member to teach a given class. The Class Schedule issued each semester will indicate what classes will be offered by whom and at what time during a given semester, though it too is subject to modification as the need arises, sometimes without prior notice.
The course description frequently states prerequisites: if none is stated, there is none. Equivalents for those stated may be accepted at the discretion of the instructor. A student should not enroll in a class for which he is not prepared.
In general, a graduate level (200-numbered) course is open to classified graduate students only. Unclassified graduate students may enrol in such a course with permission of the instructor and the Dean of Graduate Studies. Under no circumstances may an undergraduate student enroll in a graduate level course.

## Common Courses

Certain courses are common to all departments. Hence, to avoid repetition, they are listed and described only here. They are Experimental Topics 99, General College 99 and 199, the Honors Course 166, and Special Study 199.
Experimental Topics 99, is intended to provide departments opportunity for innovation and experimentation. Generally a department offers a course under this rubric to gauge student interest. If there is good response to the specific topic, the course may, with the approval of the University Curriculum Committee, become part of the standard offering of the department. In the absence of such approval it may be offered no more than three years with the same title and content. A particular topic requires the approval of the dean of the school or college concerned. A student may apply no more than nine units in

## Aerospace Studies <br> In the College of Professional Studies

Faculty
Professor: Schwab (Chairman)
Assistant Professors: French, Powers

## Offered by the Department

A.F.R.O.T.C. curriculum.

Minor in Aerospace Studies

## A.F.R.O.T.C. Curriculum

The department offers a two-year Air Force Reserve Officers' Training Corps program designed to develop officers who have broad understanding and highgrowth potential. Cadets participate in dialogues, problem solving, and other planing activities designed to develop leaders and managers. All course work is done Air Force base and the Flying Instruction Program conducted at a local civilian flying school. Summer training is required of all students, other than veterans, prior to enrollment in on-campus courses.
Upon completion of the program and all requirements for a bachelor's degree, cadets are commissioned second lieutenants in the Air Force and serve a minimum of four years active duty. Graduates who are qualified may apply for pilot or navgator training immediately upon graduation. Other graduates go on active duty in specialty consistent with their academic major and existing Air Force needs. Graduates may request a delay from entry on active duty to continue their edurce sponsored gradute study after entry on active duty.

## Applying for the Program

Any student or prospective student may take the Air Force Officer Qualifying Test and the physical examination during the year preceding entry into the program.
When selected, applicants attend a six-weeks field training course at an Air Force base in the summer prior to their last two years of college. No further summer raining is required. (Note: Veterans who are granted credit for prior military ervice may enter the program as juniors and attend a four-week field training解 physical training and participate in competitive sports. They are trained in the use of weapons, drill and ceremonies, and observe selected Air Force units perform of weapons,
everilay operations of the Air Force.

Flight Instruction and Pay
The Flight Instruction Program (FIP) is offered to qualified senior cadets who have elected to enter pilot training when reporting for active duty. The cost of the flight training is paid by the Air Force. Instruction is divided between class work taught on the campus and flying training conducted by a civilian contractor in the area.
Cadet retainer pay of $\$ 50$ per month is given for twenty months of the program. Cadets receive approximately $\$ 135$ during the Field Training Unit and are reimbursed for the cost of travel to and from the unit.

Minor
The minor consists of 15 units in aerospace studies.

## 131A-131B. Growth and Development of Aerospace Power (3-3)

Three lectures and one hour of leadership laboratory.
Semester I: The nature of war; development of air power; and Air Force
doctrine. octrine.
Semester II: Astronautics and space operations; United States space programs

## 33. Field Training Unit (3)

Required for advanced cadets; military orientation and flight familiarization Credit granted through the Extension Division on basis of individual student appli cation with approval of the Aerospace Studies Department Chairman
141A-1418. The Professional officer (3-3)
Three lectures and one hour of leadership laboratory.
Prerequisites: Air Science 131A and 131B.
Semester I: The professional officer; the Military Justice System; leadership
theory and practice. Semester II: Ma
for commissioned service.

## 151. Flight Instruction (2) I

Available only to qualified senior AFROTC students
Ground school is provided by the Aerospace Studies Department. Flight instruc-
tion is given by a contracted civilian flying tion is given by a contracted civilian flying school. Students may qualify for the
FAA private pilot certificate.

## Afro-American Studies

Administered under the direction of the Dean of

## Undergraduate Studies

For a description of the requirements for the A.B. in liberal arts and sciences with an Afro-American Studies major, see Interdisciplinary and Preprofessional Programs, above.

## 4. Urban Law (3) I, II

Legal problems of residents of urban societies, especially the urban poor. Social burdens, including juvenile and criminal processes. Social benefits and welfare sumer problems.
not open to students with credit in 1C. Anthropology 100A-100B may not be used to fulfill minimal upper division requirements in the anthropology major or minor or the special major.

## 101. Human Paleontology (3)

Prerequisite: Anthropology 1A or 100A.
Comparative anatomy of fossil man and other primates; evolutionary relationships and'cultural associations.

## 102. Physical Anthropology (3) I

Prerequisite: Anthropology 1A or 100A.
Primate comparative anatomy and human paleontology. Physical measurement of the living subject and skeletal specimens. The statistical treatment of data in physical anthropology. Applications of physical anthropology in industry and medico-legal problems.

## 103. Principles of Archaeology (3) II

Prerequisite: Anthropology 1B or 100B.
The historic background and basic techniques of archaeological excavation. Methds of site excavation with particular emphasis on California and the Southwest. Principles of culture dynamics utilized in archaeological interpretation.

## 15. Primatology (3) I

Prerequisite: Anthropology 1A or 100A.
Description, taxonomy, and comparative anatomy of the anthropoid apes, monkeys, and lesser primates. Primate behavior as a basis for the reconstruction of prehistoric human behavior. Extensive use of the primate collections of the San Diego Zoo.
120. Introduction to Anthropological Linguistics (3) I

Prerequisite: Anthropology 1A or 1B or 1C or 100 A or 100 B .
The structural nature of language. How languages differ, change, and influence ach other. The language families of the world. The significance of language for human social life in a variety of cultures.

## 122. Language in Culture (3) il

The full range of anthropological interests in the study of language, and of linguistic interests in the socio-cultural context of language. Designed for students in language and other departments as well as in anthropology.
124. Descriptive Linguistics (3) II

Prerequisite: Anthropology 120
Principles and techniques of descriptive linguistics. Problems and methods in the honetic transcription and analysis of unwritten, non-Indo-European languages Emphasis on articulatory phonetics, field techniques, and work with informants

## 48. Cultures of Europe (3) I, I

Prerequisite: Anthropology 1C or 100B.
The study of society and culture in contemporary Europe, utilizing current thnographic materials. The relationship of such studies to European culture growth and to the definition of European sociocultural regions.

## 149. Kinship and Social Organization (3) I

Prerequisite: Anthropology 1C or 100B.
Comparison of kinship systems and the structure of social relationships throughout the world. The methodological orientations and theories relating to social organization with emphasis on non-Western societies.

## 150. Ethnological Field Methods (3) I

Prerequisite: Anthropology 152.
The problems and techniques of obtaining data in ethnological and social anthropological field work; preparation, gaining and maintaining rapport, evaluating data, participant-observation. A review of literature followed by work with informants.
1515. Ethnographic Field Research Project (6) S

A six-week course. No other course may be taken concurrently. Supervised collection of ethnographic data in the field and in a subculture or
culture that is foreign to the students.
152. World Ethnography (3) I, It

Prerequisite: Anthropology 1C or 100B.
The cultural patterns of representative aboriginal peoples. Industries, arts, social organization and supernaturalism considered with a view to environmental adjust-
ment, historical development and function ment, historical development and functional interrelation. Ethnological theories reviewed and applied in interpreting illustrative aboriginal societies.
153. Primitive Religion (3) II

Prerequisite: Anthropology 1C or 100B.
Beliefs and ritual of primitive man. Magic and religion. Forms of animism and polytheism. Primitive

## 154. Social Anthropology (3) II

Prerequisite: Anthropology 152
The development of social anthropology as a distinct subfield of cultural anthropology. Readings and analysis of functionalism as theory and methodology in the
explanation of social and cultural processes.

## 155. Peasant Society and Culture (3) II

Prerequisite: Anthropology 1C or 100B.
The social organization and culture of present-day small agricultural communiy modernization.
156. Cultural Change and Processes (3) I

Prerequisite: Anthropology 1C or 100B.
The individual and the culture pattern: The acquisition of culture, innovation
and invention, direction of cultural development and invention, direction of cultural development, diffusion and interpenetration of Southwest, Eskimos, aboriginal groups of Australia, Africa and Oces: Indians of the
157. Mesoamerican Ethnohistory (3) II

Prerequisite: Anthropology 1B or 1 C or 100 B .
Aboriginal pre- and post-Conquest civilization of Mexico with emphasis on the in Colonial Mesoamerica; stress on appropriate texts
158. Economic Anthropology (3) I

Prerequisite: Anthropology 1C.
Social relationships and
Deasant societies. Cross-cultural comparisons made of the economies of primitive and peasant societies. Cross-cultural comparisons made of various means by which goods
and services are acquired and distributed in non-Western societies.
159. Cultural Ecology (3)

Prerequisite: Anthropology 1C.
Examination and comparison of the relationships which exist between the ne notionment and the socio-cultural prose 160. Primitive Technology (3) I

Prerequisite: Nine units of anthropology. of non-industrial peoples.
161. The California Indians (3) I

Prerequisite: Anthropology 1C.
Native California Indian cultur
Native California Indian cultures with stress on the Indian groups of Souther
California. The industries, arts, social organization, California. The industries, arts, social organization, folklore and religion will be
considered as revealed through the study of living peoples evidences.
162. Cultures of South America (3) It

Prerequisite: Anthropology 1B or 1C or 100B.
Indian cultures in terms of origins, migration, relation to habitat, cultural variaeffects of the Spanish contemporary trends. Development of Inca civilization, the effects of the Spanish conquest and its aftermath.

## 163. Contemporary Latin American Cultures (3) I

Prerequisite: Anthropology 1C.
A social anthropological approach to the structure and dynamics of contemporary Includins and problems, especially as revealed in studies of particular communities Included are such topics as ethnic and regional differences within national societies population change, social consequences of economic changes, changing stratifica-
tion systems, values, institutional change.

## 164. Urban Anthropology (3) I

Prerequisite: Anthropology IC or 100B.
Cultural roles of urban centers and processes of urbanization in non-Western non-industrial, societies of past and present. Urban influence on traditional peasant

## 165. Culture and Personality (3) 1 , II

Prerequisite: Anthropology 1C or 100B.
The relationship of individual personality to culture in a variety of cultures. A consideration of various theories and studies in the social and personality sciences.

## 167. History of Anthropological Theory (3) II

Prerequisite: Anthropology 1A or 1B or 1C or 100 A or 100 B
The development of theories which lie behind the modern sciences of ethnology nd archaeology. Applications of the theory of culture to field methods and interpretation of findings.

## 68. Evaluative Procedures in Culture and Personality (3) II

Prerequisite: Anthropology 165.
Methods of eliciting and evaluating cross-cultural information about patterns of ehavior. Such field methods as the interview and participant observation will be
eviewed and evaluated.

## 69-S. Backgrounds of Mexican Civilization (3) S

Mexico's archaeological past and its bearing on historic and recent peoples and cultures. Conflicts between Aztec and Mayan cultures and western civilization. The relationship of Mexican civilization to other Latin American cultures.

## 170. Archaeology of North America (3) I

Prerequisite: Anthropology 1B or 100A
Origin of the American Indian and survey of the main prehistoric cultures of the
North American continent. .
171. Ethnology of North America (3) il

Prerequisite: Anthropology 1C or 100 B
Native cultures and the role of environmental and historical factors in North

## 172A. Southwestern Prehistory (3) I

Prerequisite: Anthropology 1B or 100A.
Prehistoric Indian cultures in the American Southwest; ecological adaptations
172B. Southwestern Ethnology (3) in
Prerequisite: Anthropology 1C or 100B.
Indian cultures of the American Southwest in historic times; ecological adaptations, responses to white contact, adaptations to modern American life.
173. Advanced Archaeological Field Methods (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Anthropology 4.
Advanced projects in excavation and stabilization of ruins, archaeological surveys, laboratory analysis and preparation of reports. (Formerly numbered Anthropology
173B.)
174. Prehistoric Archaeology of Europe (3) II

Prerequisites: Anthropology 1A and 1B, or 100A and 100B
The Stone Age, Bronze Age, and Iron Age cultures of Eu
the Middle East. Industries, habitations, and art of peoples antece North Africa, and history. Methods of investigation used in reconstructing prehistoric civiliecorded 175. Cultures of Southeast Asia (3) II

Prerequisite: Anthropology 1C or 100B
Prehistory, races and cultures of Indonesia, Philippines and nearby mainland
Southeast Asia. Includes both primitive and respect to environmental, historical and peasant societies and r
76. Early Near and Middle Easter

Prerequisite: Anthropology 1B.
Anthropological foundations of historic primary civilizations of the Near and and other sources.
177. Cultures of East Asia (3)

Prerequisite: Anthropology 1C or 100B.
Peasant and primitive peoples of main.
of cultural traditions, social organization, and and insular East Asia. A comparison nawa, and Korea.
78. Culfures of Oceania (3) it

Prerequisites: Anthropology 1C or 100B.
The aboriginal cul
Polynesia in pre-historic, historic, and modern times. Australia, Micronesia, and
179. Applied Anthropology (3) II

Prerequisites: Anthropology 154 and 156, and consent of instructor
The application of anthropological concepts
The application of anthropological concepts to the solution of pralture change in industry,
culture change in industry, corporate organization solution of practical problems
180. Preclassic Cultures of Mesoamerica (3) II

Prerequisite: Anthropology 1 B or 100 B (
The development of in or 100 B
antecedent to the Tolteca, Classic Maya, and related cultures,
181. Classic Pre-Columbin Civirations

Prerequisite: Anthropology 1B or 100A Midale Ameriea (3)
Aboriginal Mexican
Exploration and Conquest. Aztecs, Mixtecs, Zapotecs, Mans through the Age of
182. Post-Conquest Cultures of Middle Americe (3) Mayas, and related cultures.

Prerequisite: Anthropology 1C or 100B
Aboriginal and mixed cultures of Mexis
and recent epochs. Aftermath of Conquest and exploitation. America in Colonial
183. Archaic Hellenic, Aegean, and Italian Cultures (3) It

Prerequisite: Anthropology 1B or 100A
Anthropological foundations of primary
other sources.
184. Archaeology of Sub-Saharan Africa (3) I

Prerequisites: Anthropology 1A and 1B or 100A.
A chronological review of the major archaeological cultures in Sub-Saharan Africa will be presented in a conjunctive the evolution of man and his culture in
conjunctive approach.
Cuifures of Sub-Saharan Africa (3)
Prerequisite: Anthropology 1C or 100B.
Indigenous peoples and cultures of Africa south of the Sahara. A comparison of cultural traditions, social organization, and modern trends in newly emergent na-
186. Cultures of India (3) II

Prerequisite: Anthropology 1C or 100B.
Indigenous peoples and cultures of India and contiguous areas of South Asia. The development of cultural traditions; social organization; and modern trends.
187. Political Anthropology (3) II

Prerequisite: Anthropology 1C or 100B.
Political processes, institutions, and ideologies in primitive and peasant societies.
188A-188B. Archaeological Laboratory Methods (3-3) I, II
Two lectures and three hours of laboratory.
Prerequisites: Anthropology 173. Anthropology 188A is a prerequisite to 188B.
Semester I: Application of palynology, paleontology and technologies. Semester II: Practical applications of materials from 188 A . Individual laboratory research project required.
189. Topics in Arctic Archaeology (3) I

Prerequisites: Anthropology 1B and 103.
Discussion of selected areas, periods or problems in the context of broad considerations of prehistoric cultural development and human ecology throughout the Arctic and subarctic regions of North America.

## 90. Archaeology of East Asia (3)

Prerequisite: Anthropology 1B.
A chronological review of prehistoric cultural development and human ecology
197. Investigation and Report (3) I, II

Prerequisite: Consent of instructor
Analysis of special topics in anthropology and preparation of reports on the
results of the study.

## 200. Seminar (3)

201. Seminar in Physical Anthropology (3)
202. Seminar in Archaeology (3)
203. Seminar in Ethnology (3)
204. Seminar in Linguistics (3)
205. Seminar in Regional Anthropology (3)
206. Seminar in Topical Anthropology (3)
207. Historical Linguistics (3) I
208. Social Structure (3)
209. Culture and Society in the Nahua Area (3)
210. Cultures and Societies in Southern Mesoamerica and Central America (3)
211. Classical Nahuatl (3) I
212. Ethnoscience (3)
213. Contemporary Theory in Cultural Anthropology (3)
214. South Asian Society (3) I, II
215. Research (3)
216. Special Study (1-3)
217. Thesis (3)

## Art

## In the College of Professional Studies

For purposes of exhibition and reference, the department reserves the right to retain for a limited period some of each student's work produced in class.

## Faculty

Emeritus: Andrews, Jackson, Ruocco
Professors:
Swiggett, Tanzelow, Dirks (Chairman), Fisch, Hopkins, Lingren, Longenecker Swiggett, Tanzer, Wallace
Associate Professors: Baker, K., Baxter, R., Berg, Covington, Higgins, Miller, Rogers, J.
Assistant Professors: Austin, Bowne, Childress, Frick, Groover, Hodge, Hunter,
L., Moaney, Orth, Papworth, Peeterson, L., Moaney, Orth, Papworth, Peterson, T., Ray

Lecturers: Fabo, Haxton, Smith, C. L., Smith, Larry
Offered by the Department
Master of Arts degree in art.
Major in art with the A.B. degree in liberal arts and sciences.
Major in art with the A.B. degree in applied arts and sciences.
Minor in art.
Teaching major in art, with specialization in both elementary and secondary teaching. Teaching majors in fine arts, fine arts and humanities and secondary and social sciences, requiring a concentration in art, are also offered. See Curricula. Curricula.
Teaching minor in art, with specialization in secondary teaching.

## Major

## With the A.B. Degree in Liberal Arts and Sciences

A major in art may be planned with an emphasis in studio arts or art history.

## Emphasis in Studio Arts

Preparation for the major. Art 1A, 1B, 2A, 2B, 5, 15A, 16A, 17A, 50A, 50B;
Philosophy 1A. ( 31 units.)
156 A Mor. A minimum of 24 upper division units to include Art 100A, 115A, 116A 156A, 190; Philosophy 141; and six units selected with the approval of the adviser from: Art $106 \mathrm{~A}-106 \mathrm{~B}, 112 \mathrm{~A}-112 \mathrm{~B}, 116 \mathrm{~B}, 117 \mathrm{~A}-117 \mathrm{~B}, 117 \mathrm{C}, 120 \mathrm{~A}-120 \mathrm{~B}, 153,154$,
$155 \mathrm{~A}, 155 \mathrm{~B}$, and 99 . $155 \mathrm{~A}, 155 \mathrm{~B}$, and 99.

## Emphasis in Art History

Preparation for the major. Anthropology 1B; Art 50A-50B, 52A-52B; French or German, or a reading knowledge of either language ( 13 units).
Major. A minimum of 24 upper division units to include Art 151, 153, 154, 155A of the department from are , approval philosophy
With the A.B. Degree in Applied Arts and Sciences
The major in art may be planned with an emphasis on art education, crafts, environmental design, graphic communication, painting and printmaking or sculpture. The programs in environmental design and in graphic communication have a preprofessional orientation supplemented by a strong liberal arts background Environmental design can lead to interior design or city planning. Graphic communication prepares the student for the areas of environmental graphics, art direc-
tion, visual design for the contemporary media of advertising, fashion illustration or editorial illustration. The areas of painting and printmaking, and sculpture prepare students for professional attitudes toward the fine arts and the continuance of their educational experience in graduate schools with the goal of teaching at instiutions of higher learning. The preprofessional program in art education prepares the student for teaching in either elementary or secondary schools. The crafts program can be developed to specialize in ceramics, furniture or industrial design, jewelry, textile design and weaving.
A minor is not required with this major. However, in graphic communication
an English minor is recommended.

## Emphasis on Crafts

Preparation for the major. Art 1A, 1B, 2A, 2B, $50 \mathrm{~A}, 50 \mathrm{~B}, 61$, and six units of art electives. ( 25 units.)
Maior. A minimum of 24 upper division units in art to include nine units selected from three of the following areas: Fiber, metal, clay, wood; three units of extended work in one of the selected areas; six units of art electives; and six units of art history. Twelve units of advanced work in one area are strongly recommended.

## Emphasis on Graphic Communication

Preparation for the major. Art 1A, 1B, 2A, 2B, 14A, $50 \mathrm{~A}, 50 \mathrm{~B}$; and six units selected from Art 7, 14B, 15A, 16A, 18A. ( 25 units.)
Major. A minimum of 24 upper division units in art to include Art 114A, 114B$107,114 \mathrm{D}, 191 \mathrm{~A}, 191 \mathrm{~B}, 193 \mathrm{~A}-193 \mathrm{~B}, 194 \mathrm{~A}-194 \mathrm{~B}, 196 \mathrm{~A}-196 \mathrm{~B}$, and 197 .

## Emphasis on Environmental Design

Preparation for the major. Art 1A, 1B, 2A, 2B, 8, 13, 33A, 33B, $50 \mathrm{~A}, 50 \mathrm{~B}$, 95 A . ( 31 units.) Recommended: Art $14 \mathrm{~A}, 17 \mathrm{~A}, 18 \mathrm{~A}, 19 \mathrm{~A}, 61,80 \mathrm{~A}$. Major. A minimum of 24 upper division units in art to include Art 156A; three additional units of art history; and 18 units selected from $135 \mathrm{~A}-135 \mathrm{~B}, 156 \mathrm{~B}$,
$195 \mathrm{~A}, 195 \mathrm{~B}, 195 \mathrm{C}, 195 \mathrm{D}$; and three units of electives.

## Emphasis on Painting and Printmaking

$\begin{aligned} & \text { Proparation for the major. Art } \\ & \text { selected from Art } 15 \mathrm{~A}-15 \mathrm{~B}, 16 \mathrm{~A}, 16 \mathrm{~B}, ~(25 \text { units.) }\end{aligned}$
Major. A minimum of 24 upper division units in art to include Art 156A; three additional units of art history; and 18 units selected in consultation with three viser from Art $100 \mathrm{~A}, 100 \mathrm{~B}, 106 \mathrm{~A}-106 \mathrm{~B}, 112 \mathrm{~A}-112 \mathrm{~B}, 115 \mathrm{~A}-115 \mathrm{~B}-115 \mathrm{C}-115 \mathrm{D}, 116 \mathrm{~A}-$ $116 \mathrm{~B}, 116 \mathrm{C}-116 \mathrm{D}, 118 \mathrm{~A}-118 \mathrm{~B}, 120 \mathrm{~A}-120 \mathrm{~B}, 126 \mathrm{~A}, 126 \mathrm{~B}, 136 \mathrm{~A}, 136 \mathrm{~B}$.

## Emphasis on Sculpture

Preparation for the major. Art 1A, 1B, 2A, 2B, 17A-17B, 50A, 50 B ; and three
units selected from Art $13,15 \mathrm{~A}, 16 \mathrm{~A}, 19 \mathrm{~A}, 61,70,80 \mathrm{~A}$. ( 25 units.) Major. A minimum of 24 upper division units 10 . ( 25 units.) $117 \mathrm{C}, 156 \mathrm{~A}, 198$; three additional units of art history; and six units or 127, 117B $100 \mathrm{~A}, 113 \mathrm{~A}, 115 \mathrm{~A}, 116 \mathrm{~A}, 170 \mathrm{~A}$.

## Emphasis on Art Education

This emphasis is available only to students who have been admitted to and con-
tinue in Teacher Education to time of graduation.

## Elementary Teaching

Preparation for the major. Art 1A, 1B, 2A, 2B, 50A, 50B, 61; and six units
of art electives. ( 25 units.) Melectives. (25 unis.)
Major. A minimum of 24 upper division units in art to include 15 units se105 or $175 ; 156 \mathrm{~A}$, and three units of art history with the art education adviser; Ar 105 or $175 ; 156 \mathrm{~A}$, and three units of art history.

## Secondary Teaching

Preparation for the major. Art 1A, 1B, 2A, 2B, 50A, 50B, 61 ; and six units
of electives. ( 25 units.)
Major. A minimum of 24 upper division units in art to include Art 156A; three with the art education adviser. units from Group I or Group II in consultation the art education adviser.
Group I. Fifteen units of one major emphasis area, including Art 175 and three Group II Six units of drowing and . units.
and three units of graphic communication or environmental crafts or sculpture; ( 18 units.)

For the Standard Teaching Credential
All candidates for a teaching credential must complete all requirements for the applicable specialization as outlined in the section of this catalog on the School of
Education.

## Specialization in Elementary Teaching

Requirements are the same as the requirements for the degree with an emphasis in art education for elementary teaching as outlined above.

## Specialization in Secondary Teaching

Requirements are the same as the requirements for the degree with an emphasis in art education for secondary teaching as outlined above. In addition, students must complete, in their postgraduate year, a minimum of six units of upper division
or graduate art electives including Art 222.

## Minor

The minor for the bachelor's degree consists of 15 units in art, six of which must be upper division.
The teaching minor in art for secondary teaching consists of the following: In the lower division, Art 1A, 1B, 2A, 2B, $50 \mathrm{~A}, 50 \mathrm{~B}$; and in the upper division twelve units in one emphasis area including Art 156A. (28 units.)

## 1A. Drawing and Composition (3) I, II

Six hours.
The ordering of two-dimensional space through drawing.

## 1B. Drawing and Composition (3) I, II

Six hours. Prerequisite: Art 1A.
Drawing of mechanical and natural forms by the use of line and value. Emphasis on proportion and structure. Some quick sketching, gesture and contour drawing.

## 2A. Design and Aesthetics (3) I, II

Six hours.
Fundamentals of space and color design. Basic course used as a prerequisite for advanced work. Not open to students with credit in Art 6 A or a prerequisite for
28. Design and Aesthetics (3) 1, II

One lecture and six hours of laboratory.
Prerequisite: Art 2A.
Continuation of Art 2A. Original work in creative design including projects in three dimensions. Not open to students with credit in Art 6 B or 10 .
5. Art Orientation (3) I
5. Art Orientation (3)

An illustrated lecture course dealing with aesthetic meaning and a survey of the history of western art. Designed to increase the understanding and appreciation of
art.
7. Visual Design (3) 1 , II

Six hours.
Prerequisites: Art 2B and 14A.
The organizational concepts of design applied to environmental graphics and
merchandising display. . Hous deplay.
8. The House and Its Environment (3) I, II

Architecture, interior design, landscape and city planning for forming man's phys-

## 13. Furniture Design (3) I, II

Six hours.
Prerequisite: Art 2A. Recommended: Industrial Arts 5.
Study of the principles of design through the making of furniture.
14A. Beginning Graphic Communication (3) I, II
Six hours.
Prerequisites: Art 1A and 2B.
Creative projects exploring the inter-relation of fundamental art principles and
148.

## 4B. Intermediate Graphic Communication (3) I, II

## Six hours.

Prerequisite: Art 14A.
Typographic and design concepts applied to layout for contemporary media.
15A-15B. Life Drawing (3-3) I, II
Six hours.
Prerequisite: Art 1B. Art 15A is prerequisite to 15B.
Drawing from the nude model.

## 16A. Painting (3) I, II

Six hours.
Prerequisite: Art 1B
Pictorial composition and techniques of painting.

## 16B. Oil Painting (3) I, II

Six hours.
Prerequisite: Art 16A.
Landscape and more advanced composition in color.

## A-17B. Sculpture (3-3) I, II

Six hours.
17B.
Three dimensional design using varied materials.

## 18A-18B. Watercolor Painting (3-3) I, II

Six hours.
Prerequisites: Art 1A and 1B. Art 18A is prerequisite to 18B.
Composition of still-life and landscape in watercolor.

## 19A. Ceramics (3) I, II

Six hours.
Prerequisite: Art 2A.
Design and construction of hand-built ceramic forms.
198. Ceramics (3) I, II

## Six hours.

Prerequisite: Art 19A
Continuation of Art 19A. Introduction to use of the potter's wheel and application of glaze for surface enrichment

## 27. Life Modeling-Sculpture (3) I, I

Prerequisite: Art 17A
Creative experimentation with sculptural forms from the human figure.

## 33A-33B. Visual Presentation (3-3) I, II

Six hours.
Prerequisites: Art 1B, 2A; 33A is prerequisite to 33B, and Art 18A recommended.
Methods, materials, and tools of the professional environmental designer stressing art principles. (Formerly numbered Art 133A and 133B.)
50A. Appreciation and History of Art (2) I, II
Art development in painting, sculpture, architecture, and handicrafts from the
dawn of art to the Renaissance. Illustrated.

## Sob. Appreciation and History of Art (2) I, II

The period from the Renaissance through the modern school treated in the same manner as in 50A.
52A. Survey of Japanese Art (3) II
A study of the arts of Japan.

## 52B. Survey of Chinese Art (3)

A study of the arts of China.

## 61. Design in Crafts (3) I,

Six hours.
Prerequisite: Art 2A.
Visual and structural form in crafts.
70. Beginning Jewelry Design (3) I, II

Six hours.
Prerequisites: Art 2B and 61
Design and fashioning of jewelry

## 80A-80B. Weaving (3-3) I, II

Six hours.
Prerequisite: Art 61. Art 80A is prerequisite to 80B.
Structure and design of woven fabrics.

## 94A-948. Fashion Imagery (3-3) I, II

Six hours.
Prerequisite: Art 2A. Art 94A is prerequisite to 94B.
Design of original contemporary costumes and the drawing of the fashion image.

95A. The Confemporary House (3) I, II
Six hours.
Prerequisites: Art 1A, 2A, and 8.
Elementary problems in neighborhood planning, house design, interior design and
andscaping. landscaping.
95B. General Interior Design Theory (3) I, I
Six hours.
Prerequisite: Art 95A.
Concepts of space in architecture, landscape and interior design. Relationship of furniture, fabrics, light, color and art.

## 100A. Advanced Drawing (3) I, II

## Six hours.

Prerequisites: Art 15A and 16A.
Drawing with color wherein an objective attitude is taken toward the qualita tive aspect of visual subject matter. Objects are studied and represented as visual
stimuli rather than as stereotypes.

## 008. Advanced Drawing (3) I,

Six hours.
Prerequisite: Art 100A.
Drawing with color wherein objects are represented in such a manner as to 105.

## 105. Classroom Environmental Design (3) I, II

Six hours.
Development of an understanding for aesthetic environmental concepts as re-
lated to the classroom.
106A-106B. Printmaking (3-3) I, II
Six hours.
Prerequisite: Art 15A; 106A is prerequisite to 106B. Woodcut, wood engraving
gesso cut and linoleum.

## . Contemporary Environmental Graphics (3) I, II

Six hours.
Prerequisites: Arts 2A. Art 2B and 14A are recommended
Study of creative design for contemporary architectural and motivational
graphics.
108. The House and Its Environment (3) I, II

Architecture, interior design, landscape and city planning for form physical and aesthetic environment, its simplicities and complexities. Not open to
students with credit in Art 8 . IIO. Advaned Crats in 8 .

## Crafts in the Elementary Schools (3) I, It

Prerequisite: Art 2A.
An advanced design-craft course in which the activities, materials and tools in Art 61 .

## 11A-111B. Industrial Design (3-3) I,

 Six hours.Prerequisites: Art 1A and 2B. Art 111A is prerequisite to 111B.
Design of objects for manufacture with referen
accordance with factory practices and machine techniques use, materials, and in niques of presentation, working drawings, rendering in Practice in the tech models.

112A-112B. Design and Composition (3-3) I, II
Six hours.
Prerequisites: Art 1A, 1B, 2B, and 16A. Art 112A is prerequisite to 112B.
Structure in picture making. The controlled use of line, value, color, and texture to organize the effect of depth, movement, volume, etc., in the recognizable image.

113A-113B. Advanced Furniture Design (3-3) I, II
Six hours. Total credit in Art 13, 113A, 113B, 113C, and 113D limited to eight units.
Prerequisite: Art 13. Recommended: Industrial Arts 5. Art 113A is prerequisite to
Principles of design through the making of furniture.
113C-113D. Advanced Furniture Design (3-3) I, II
Six hours. Total credit in Art 13, 113A, 113B, 113C, and 113D limited to eight units.

Prerequisite: Art 113B. Art 113C is prerequisite to 113D
Advanced individual design; exploration of materials, process and function.

## 14A. Graphic Communication (3) I, II

Six hours.
Prerequisite: Art 14B.
Investigation of design concepts relating to advertising.
114B-114C. Advanced Graphic Communication (3-3) I, II Six hours.
Prerequisites: Art 114A. Art 114B is prerequisite to 114C.
The relation of art structure and the aspects of visual communication.
114D. Problems in Graphic Communication (3) $\mathbf{I}, \mathbf{I I}$
Six hours.
Prerequisite: Art 114C.
Refinement of personally developed design concepts for visual communication with emphasis on individually directed solutions. The development ofmunication of professional quality. Maximum of six units selected from 114 series applicable on a master's degree.
115A-115B-115C-115D. Life Drawing and Painting (3-3-3-3) I, II
Six hours.
Prerequisites: Art 15A and 16A. Art 115A is prerequisite to 115 B ; 115B to 115 C 15C to 115D.
Drawing and painting from nude and costumed models.
116A-116B. Advanced Painting (3-3) I, II
Six hours.
Prerequisite: Art 16A or 16B. Art 116A is prerequisite to 116 B .
Pictorial composition.
Sixh hod.
Six hours.
Prerequisite: Art 116B. Art 116C is prerequisite to 116D
The influence of art media and picture plane on aesthetic organization in repesentational painting.

## 117A-117B. Advanced Sculpture (3-3) I, II

Six hours.
Prerequisites: Art 2B and 17A or 17B. Art 117A is prerequisite to 117B.
Creative design in diverse materials. Maximum of six units selected from 117 series applicable on a master's degree.

Six hours.
Six hours.
Prerequisite: Art 117B.
The influence of art media and tools on aesthetic organization in sculpture in
relief and in the round. relief and in the round.

## 118A-118B, Advanced Watercolor Painting (3-3) I, II

Six hours.
Prerequisite: Art 18B. Art 118A is prerequisite to 118B.
Composition of still life and landscape in watercolor.

## 119A. Ceramics (3) I, II

Six hours.
Prerequisite: Art 19B
Basic methods of forming, decorating, glazing and firing pottery forms with emphasis on the use of the potter's wheel.
198. Ceramics (3) I, II

## Six hours.

Prerequisite: Art 119A
Continuation of Art 119A. Further development of knowledge, skills and philoso phy of ceramics through individual creative projects.

## 119C. Ceramics (3) I, II

## Six hours.

Prerequisite: Art 119B.
Continuation of Art 119B with advanced creative projects.

## 119D. Advanced Ceramics (3) I, II

## Six hours.

Prerequisites: Art 119C
Study of ceramic design through creative projects of clay forms
120A-120B. Advanced Design (3-3) I, II

## Six hours.

Prerequisites: Art 1B and 2B. Art 120A is prerequisite to 120B.
Advanced work in pure design, two and three dimensional. Re-examination of 20,

## 126A. Intaglio Printmaking (3) I, II

Six hours.
Prerequisites: Art 2A and 15A. Art 100A and 115 A are recommended.
Creative intaglio-etching, drypoint, aquatint, engraving and variations. Emphasis
on fine print quality and technical development.

## 26B. Intaglio Printmaking (3) I,

## Six hours.

Prerequisite: Art 126A.
Advanced creative intaglio. Emphasis on fine print quality and the color process.
127. Advanced Figurative Sculpture (3) I, II

Six hours.
Prerequisites: Art 17A and 27.
Figurative study with emphasis on individual exploration.
129A-129B. History of Ceramics (3-3) I, II
Prerequisite: Art 129A is prerequisite to 129B
Philosophical approaches to design of pottery and techniques as related to temporary ceramics. Field trips.

135A-135B-135C. History and Theory of Environmental Design (3-3-3) I, II
Prerequisites: Art 50A, 50B; Art 135A is prerequisite to 135 B and 135 B to 135 C Environmental arts. Semester I: From earliest times to the 15 ch Century. Semester II: 15 th to the 19th Century. Semester III: 19th and 20th Centuries.
136A. Lithography Printmaking (3) I, II
Six hours.
Prerequisites: Art 2A, 15A. Art 100A and 115A are recommended.
Creative lithography-stone and plate planographic process. Emphasis upon fine print quality and technical development.

## 136B. Lithography Printmaking (3)

Six hours.
Prerequisite: Art 136A.
Advanced creative lithography-emphasis upon the color process and fine prin quality.
151. Art of Middle America (3) Irregular

Middle American art from earliest time to the present (Formerly numbered 51.)
152A. The Art of India and Southeast Asia (3) Irregular
Prerequisites: Art 50A and 50B.
History of the art, architecture, and sculpture of India and Southeast Asia.
152B. The Art of Persia and the Islamic World (3) Irregular
Prerequisites: Art 50A and 50B
History of the art, architecture, sculpture and minor arts of Persia and the Islamic World.

## 153. Ancient Art (3) I

Prerequisites: Art 50A and 50B.
Development of painting, sculpture, architecture and crafts from prehistoric times to the fall of Rome.

## 154. Medieval Art (3) II

Prerequisites: Art 50A and 50B.
Development of painting, sculpture and architecture from the time of Constantine through the Gothic period.

155A. Renaissance Art (3) I
Prerequisites: Art 50A and 50B.
Architecture, sculpture and painting of the Renaissance.

## 55B. Baroque and Rococo Art (3) II

Prerequisite: Art 155A.
Architecture, sculpture and painting of the Baroque and Rococo periods.

## ISaA. History of Modern Art (3) I, II

Prerequisites: Art 50A and 50B.
Development of painting, sculpture, and architecture from the French Revolution to the 20th century.

156B. Contemporary Art (3) Irregular
Prerequisite: Art 156A
Current movements in sculpture, painting, graphics, and architecture.

## 157. The History of American Art (3) Irregular

Prerequisites: Art 50A and 50B.
Development of painting, sculpture, and architecture from Colonial times to the present.
158. Art of Primitive Peoples (3) Irregular

Prerequisites: Art 50A and 50B.
Arts of primitive peoples of Africa, South Seas, and the North American Indians and their influence upon the art of the twentieth century.
160. The History of Archifecture (3) Irregular

Prerequisites: Art 50A and 50B, or Art 5.
Architecture from primitive times to the present.
161A-1618-161C-161D. Design in Enamels (3-3-3-3) I, 1
Six hours.
Prerequisite: Art 61; Art 161A is prerequisite to 161B, 161B to 161C, 161C to 161D Design and production of vitreous enamels. Maximum credit six units appli-
cable on a master's degree. 's degree.
164. History of Costume (3) Irregular

Prerequisites: Art 50A and 50B
influences dominant during each period.
170A. Beginning Jewelry Design (3) i, It
Six hours.
Prerequisites: Art 2B and 61.
Design and fashioning of jewelry. Not open to students with credit in Art 70.
170B. Jewelry and Metalwork (3) I, II
Six hours.
Prerequisites: Art 70 or 170A
Design and production of jewelry and hollow ware.
170C-170D. Jewelry and Metalwork (3-3) I, I
Six hours.
Prerequisite: Art 170C is prerequisite to 170 D
Advanced individual problems in jewelry.
5. Problems in Art for Teachers (3) $\mathbf{I}, \mathbf{I}$

Six hours.
Art principles and materials as related to teaching situations.
180A-180B. Advanced Weaving (3-3) I, II
Six hours. Total credit in Art 80A, 80B, 180A, 180B, 180C, and 180D limited to
eight units.
Prerequisites: Art 80A and 80B Art 180A is
Advanced problems in forequisite to 180 B
and rug weaving techniques.
180C-180D. Advanced Weaving (3-3) I, II
Six hours. Total credit in Art 80A, 80B, 180A, 180B, 180C, and 180D
Prerequisite: Art 180B. Art 180C is prerequisite to 180D
Advanced individual problems in weaving.
181. Non Woven Textile Construction (3) I, II

Six hours.
Prerequisites: Art 2B and 61.
Textile structures with an emphasis on non loom techniques
190. Principles and Elements of Visual Aesthetic Organization (3)

Three hours
Prerequisites: Senior standing and Art 5.
Visual aesthetic materials and the psychological principles involved in aesthetic organization.
191A. Gallery Exhibition Design (3) I, II
Six hours.
Prerequisite: 14 units of art.
Fundamental art elements and principles applied to the theories and techniques of gallery exhibition design.
191B. Gallery Exhibition Design (3) I, II
Six hours.
Prerequisite: Art 191A.
Advanced problems in the theories and techniques of gallery exhibition design.
193A-193B. Drawing and Illustration for Graphic Communication (3-3) I
Six hours.
Prerequisites: Art 1B, 2A, 115A. Art 193A is prerequisite to 193B.
The disciplines of realistic descriptive illustration including problems in imaginative, aesthetically refined painterly illustration. Media to include gouache, water-
color, scratch board, mixed media, and pen and ink.
194A-194B. Adivanced Fashion Imagery (3-3) I, II
Six hours.
Prerequisite: Art 94B is recommended. Art 194A is prerequisite to 194B.
Emphasis on developing individual drawing concepts and creative techniques in Emphasis on developing individual drawing concepts and creative techniques in
fashion illustration. Creation of fashion drawings and fashion advertising layouts. Development of a professional portfolio.

## 195A. Interior Design (3) I, II

Six hours.
Prerequisites: Art 95A and 95B.
Survey, analysis and design methods concerning problems of interior design of moderate scope, stressing the visual concept as part of the total planning process.

## 195B. Environmental Design (3) I, II

Six hours.
Prerequisite: Art 195A
Survey, analysis and design synthesis of problems of more complexity, through interiors, to landscape, to architectural planning, and finally concern for city design.
195C. Economics of Interior Design (3) I, II
Six hours.
Prerequisite: Art 195B
Techniques and analyses of specification writing, supervision and budget studies of interior design and its application to various projects.

## 195D. Advanced Interior Design (3) I, I

## Six hours.

Prerequisite: Art 195C.
The complete conception and execution of all stages of a full-scale interior design project.
196A-196B. Visual Communication Media (3-3) I, II
Six hours.
Prerequisite: Art 14B. Art 196A is prerequisite to 196B.
Experimental, creative and practical exploration of contemporary communication as related to magazine and editorial layout. Production of a student designe limited edition.
$4-81517$

## Astronomy <br> In the College of Sciences

## Faculty

Emeritus: Huffer, Smith, C.
Professors: Nelson, B. (Chairman), Schopp
Associate Professors: Daub, Young, A.
Assistant Professors: Angione, Talbert
Lecturer: Martin, A

## Offered by the Department

Master of Science degree in astronomy.
Major in astronomy with the A.B. degree in liberal arts and sciences.
Major in astronomy with the A.B. degree in applied arts and sciences. Minor in astronomy.

## Major

## With the A.B. in Liberal Arts and Sciences

Preparation for the major. Astronomy 1,9; and Physics 4A-4B-4C (16 units).
Major. A minimum of 24 upper division units to include Astronomy 104A$104 \mathrm{~B}, 112 \mathrm{~A}-112 \mathrm{~B}$; and Physics 101, 105, 112, and three additional units of upper division physics. Recommended: Ástronomy 170; Physics 103, 106, 110, 175, 190.
Minor in Mathematics. Students majoring in astronomy must complete a minor Minor in Mathematics. Students mathematics to include Mathematics $50,51,52$ and either 118A-118B or 119 , and three additional units of upper division mathematics. Recommended: Mathematics three additional units of upper $135 \mathrm{~B}, 175$; Engineering 188 .

## With the A.B. Degree in Applied Arts and Sciences

Preparation for the major. Astronomy 1, 9; Physics 4A-4B-4C (16 units).
Major. A minimum of 24 upper division units to include Astronomy 104AMa4B, $112 \mathrm{~A}-112 \mathrm{~B}, 198 \mathrm{~A}-198 \mathrm{~B}$; and Physics $101,105,112$. Recommended: Astronomy 104B, 112A-112B, 198A-198B; and Physic
Minor in Mathematics. Students majoring in astronomy must complete a minor in mathematics, to include Mathematics 50,51 , 52 , and either $118 \mathrm{~A}-118 \mathrm{~B}$ or 119 , and three additional units of upper division mathematics. Recommended: Mathematics 7, 135A, 135B, Engineering 188.

## Minor

The minor consists of 15 units in astronomy, nine of which must be upper division.
. Deseriptive Astronomy (3) I, II
Methods of astronomy and of the physical nature of members of the solar system, our galaxy and other galaxies. Telescopes will be used for occasional observations. Not open to students with credit in Astronomy 50.
9. Practice in Observing (1) I, II

Three hours of laboratory.
Prerequisite: Credit or concurrent registration in Astronomy 1 or 50.
A course designed to supplement Astronomy 1. The course will include constellation study, use of astronomical co-ordinates, and descriptive observations of celestial objects with telescope.

## Astronomy

180. Celestial Mechanics (3) I, II

Prerequisite: Mathematics 52.
The problem of two bodies based on the solutions of differential equations using Newtonian mechanics. Potential theory; geometrical interpretation of perturbations; calculation of planetary positions.
196. Advanced Topics in Astronomy (2 or 3) I, II

Prerequisite: Consent of instructor.
Selected topics in theoretical astronomy or astrophysics. May be repeated with new material for a total of six units, upon approval of instructor.

198A. Senior Project (1)
One lecture-discussion period.
Prerequisite: An acceptable master plan for graduation within one year
Consists of the selection and design of individual projects; oral and written prog ress reports.

198B. Senior Project (2) II
Six hours of laboratory.
Prerequisite: Astronomy 198A
Laboratory work, progress reports, oral and written reports

## 200. Seminar (2 or 3)

210. Binary Stars (3)
211. Galactic Structure (3)
212. Stellar Interiors (3)
213. Interstellar Matter (3)
214. Stellar Atmospheres (3)
215. Orbit Theory and Computation (3)
216. Research (1-3)
217. Special Study (1-3)
218. Thesis (3)

Athletics

## In the College of Professional Studies

## Faculty

Professors: Coryell, Karr (Chairman)
Associate Professors: Baldock, Davis, R.
Issistant Professors: Dowhower, Gilbert, C., Templeton, Zampese
Insera, Vezie
bera, Vezie
180. Theory and Practice of Intercollegiate Sports (Men) (2-3)

Two units: 8 hours. Three units: 12 hours.
Concentrated study in field of interest, with emphasis on skill, strategy, tactics,
rules, officiating, and organizing.

Offered in the Fall
A Basketball (3)
B Cross Country (2)
C Football (3)
Dymnastics (3)
E Swimming (2)
F Water Polo (2
G Wrestling (3)
N Soccer (2)

Offered in the Spring
H Baseball (3)
Golf (2)
J Rowing (2)
K Tennis (2)
Track (3)
M Volleyball (2)

## Biology <br> In the College of Sciences

## Faculty

Professors: Baer, Brandt, Cox, G., Farris, Flittner, Hazen (Chairman), Johnson, A., McBlair, Neel, Ratty, Rinehart, Shepard, Sloan, Taylor, K

Associate Professors: Awbrey, Brookes, Clark, M. E., Collier, B., Daugherty, Associate Professors: Awbrey, Brookes, Thwaites
Assistant Professors: Davis, C., Diehl, Ebert, Futch, Hurlbert, Kleinbergs, Mel Assistant Professors: Davis,

## Offered by the Department

Doctor of Philosophy degree in genetics and in ecology
Master of Arts in biology.
Master of Science in biology
Major in biology with the A.B. degree in liberal arts and sciences. Major in biology with the A.B. degree in applied arts and sciences. Major in biology with the B.S. degree in applied arts and sciences. Minor in biology.
Curricula which prepare for the fields of dentistry, conservation, fisheries, marine biology, medicine, veterinary medicine, and wildlife.
Tacher spiences, with specialization in secondary teach Teaching major in the biological sciences, with specialization in secondary
Teaching minor in biology, with specialization in both elementary and secondary teaching.

## Biology Major

With the A.B. Degree in Liberal Arts and Sciences
For the foreign language required for graduation, the department recommends French, German, or Russian
Preparation for the major. Biology 1, 2, and 15; Chemistry 1A-1B and 11 or 12 Preparation 21 and 22; Physics 1A-1B or 2A-2B and 3A-3B. ( 35 or 37 units.)
Major. A minimum of 24 upper division units to include Biology 101, 110, and major. A men in the junior year); an advanced course in the biological science 155 which Biology 101, 110 or 155 is prerequisite; Biology 190, 191 or 195; and electives from natural science selected with the approval of the adviser.

## Biology Major

With the A.B. Degree in Applied Arts and Sciences
Students must complete twelve units of a single foreign language (chosen from French 1,2, and 3 or $8 \mathrm{~A}-8 \mathrm{~B}$; or German 1,2, and 3 or $8 \mathrm{~A}-8 \mathrm{~B}$; or Russian 1, 2, and 3 or $8 \mathrm{~A}-8 \mathrm{~B}$ ), or equivalent knowledge demonstrated a test of reading knowled and

Preparation for the major. Biology 1, 2, and 15; Chemistry 1A-1B and 11 or 12; Preparario 21 and 22 ; Physics $1 \mathrm{~A}-1 \mathrm{~B}$ or $2 \mathrm{~A}-2 \mathrm{~B}$ and $3 \mathrm{~A}-3 \mathrm{~B}$ or Physics $4 \mathrm{~A}-4 \mathrm{~B}-4 \mathrm{C}$. (35-43 units.)

Major. A minimum of 24 upper division units to include Biology 101, 110, and 155 (to be taken in the junior year); an advanced course in the biological sciences or which Biology 101, 110 or 155 is prerequisite; Biology 190, 191 or 195; and lectives from natural science selected with the approval of the adviser.

## Biology Major

## With the B.S. Degree in Applied Arts and Sciences

 ( $35-43$ units.)
Major. A minimum of 36 upper divis. 155 (to be taken in the junior year); an advanced course in Biology 101, 110, and for which Biology 101, 110 or 115 ; is advanced course in the biological scisiences
electives from natural science selected with the anolog 190, 191 or 195; and

## Biology Minor

The minor in biology consists of 16 units in biological sciences to include Biology 1 and 2, and nine upper division units in biologcal sciences selected with approval
of the biology adviser.

## Biological Sciences Major For the Standard Teaching Credential

## Specialization in Secondary Teaching

The teaching major for secondary teaching rer one of the biological sciences: biology, botany, microbiolergraduate major in
elective courses in elective courses in the major must have prior approval byogy, or zoology. All
sciences advisers Postoravisers for teaching programs in the apiological sciences. the biological Postgraduate year. A minimum of six units fological sciences.
uate credit on a master's degree program in the biological sciencesptable for grad-
minor.

## Biology Minor

## For the Standard Teaching Credential

## Specialization in Elementary Teaching

The minor in biology for elementary
Electives in teast 20 units in the biological sciences to of Chemistry 1 A-1B partmental adviser forical sciences must be chosen in incluade Biology 1 and 2 . partmental adviser for teaching programs.

## Specialization in Secondary Teaching

The minor in biology for sec
11 or 12 , plus at least 20 units in the biological sciensists of Chemistry $1 \mathrm{~A}-1 \mathrm{~B}$, and

Biology (3) I, II
Prerequisites: None; concurrent registration in Biology 2 recommended.
2. General Biology liog stressing processes common to living organisms.

Three
Prerequisite Credit
A laboratory course in biology stresgistration in Biology 1.
4. Natural History of Plants and Animals (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: Biology 1.
An introduction to plants and animals in relation to their environments and to one another, with emphasis on local forms and their habitats.
9. Human Physiology (5) I, II

Three lectures and six hours of laboratory.
Prerequisites: Zoology 8 or 60; Chemistry 2A-2B
Functions of the human body; emphasis on the circulatory, muscular, and nervous systems. Not open for credit to students with credit for Biology 22.
15. Introduction to Quantitative Biology (3) I, II

Two lectures and three hours of laboratory.
Prerequisites: Biology 1, 2, and Mathematics 21.
Methods and experience in defining and solving quantitative problems in biology including the design of experiments, and parametric and nonparametric statistica techniques.
25. Introduction to Heredity (3) I, II

Hereditary mechanisms and consideration of the social implications of recen and expected developments in the field of heredity.
101. Cellular Physiology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1, 2, and 15; Chemistry 1A, 1B, and 11 or 12; Physics 2A, $2 \mathrm{~B}, 3 \mathrm{~A}, 3 \mathrm{~B}$ or $4 \mathrm{~A}-4 \mathrm{~B}-4 \mathrm{C}$.
Physiological processes at the cellular level.
103. General Cytology (4) II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1, 2, and 15; and Chemistry 1A and 1B.
The structure and function of cells and cell inclusions of plants and animals including the chemical and physical properties of protoplasm and cytological methods.
109. Regional Field Studies in Biology (1-3)

One- to three-week periods during vacations and summer sessions.
Prerequisites: At least 12 units in the biological sciences, including Biology 1 and 2 , and consent of instructor
Extended field studies of the flora, fauna, and biotic communities of major natural regions of western North America. May be repeated with new content to a maximum of six units.
110. Ecology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1, 2, and 15; and Chemistry 1A and 1B.
Relationships between organisms and the environment; field study in local marine Relations, mountain, chaparral, and desert habitats.
111. Aquatic Biology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1, 2; and 15; and Chemistry 1A and 1B.
Biological, chemical and physical considerations of inland waters.

## 112. Fisheries Biology (3) II

Two lectures and three hours of laboratory.
Prerequisite: Biology 110.
Fisheries of commercial importance. The dynamics of exploited populations.
13. Biological Oceanography (4) I, I

Two lectures and six hours of laboratory
Prerequisites: Biology 110, Zoology 50, Chemistry 1B, Physics 2
environment. Field and laboratory experience and benthic marine organisms and their larly the coastal environment.
114. Advanced Ecology (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: Biology 110.
The ecology of individuals, populations, or communities. May be repeated with
new content. Maximum credit six units new content. Maximum credit six units applicable on a master's degree.
115. Conservation of Wildlife (3) I, II

Prerequisite: Biology 1.
Plant and animal resources with emphasis on their conservation and intelligent
121. Systems Ecology (5) I, II

Four lectures and three hours of laboratory.
Prerequisites: Biology 110 and consent of instructor.
Provides a foundation in the theory and techniques necessary for a systems matics useful in systems analysis.
122. Environmental Measurement (3) I, II

Two lectures and three hours of laboratory
Prerequisites: Biology 110 and consent of instructor
conditions, including field conditions, types of sensors, amplifiers and dects of fluctuations in environmenta components.
cal Systems (4) I, II
Two lectures and six hours of laboratory
Prerequisites: Biology 121 and consent of instructor
Properties of different types of models, Mret
a means of guiding re, ways of evaluating models, the use methods, the design of
g research. The computer will be extensively used
40. Principles of Human Physiology (3) I,

Prerequisite: Biology 1 or Zoology 8.
Principles of human physiology. Body maintenance and nerve and muscle phys
22.) Not open to students with credit in Biology 9. (Formerly numbered Biology
141. Human Physiology Laboratory (1) I, II

Three hours of laboratory.
Prerequisite: Credit o
Laboratory work in concurrent registration in Biology 140
Biology 9. (Formerly numbered Biology 23.) Not open to students with credit in
142A-142B. Comparative Animal Physiology (4-4) I, I
Two lectures and six hours of laboratory (4-4) I, II
Prerequisite: Biology 101 and contery.
Semester I: Feeding and
and metabolism, excretion and osmoregulation and circulation, nutrition, respiration integrative sytsems. In both semesters, considen. Semester II: Receptor, effector, nution ular to organismal levels. All major consideration of function ranges effector, an research. (Formerly numbered Biology 142.) are considered. Individual laboratory

Biology
148. Photophysiology (3) II

Prerequisite: Biology 101.
Bioluminescence and the physiological effects of visible and ultraviolet radiations on plants and animals.

## 148L. Photophysiology Laboratory (1) II

Three hours of laboratory.
Prerequisite: Credit or concurrent registration in Biology 148.
The generation, measurement and control of visible and ultraviolet radiations, and the measurement and analysis of selected biological effects of these radiations.
150. Radiation Biology (3) 1 , II

Prerequisites: Biology 1 or equivalent and Physics 2A-2B, 3A-3B. Recommended Chemistry 1A-1B, Biology 101, and Physics 121.
Principles underlying radiological reactions of ionizing radiations. Effects of Principles underlying radiological reactions of ionizing radiations.

## 150L. Radiation Biology Laboratory (1) I, II

## Three hours of laboratory

Prerequisite: Credit or concurrent registration in Biology 150.
The laboratory determination of the effects of ionizing radiation on biological systems.

## 151. Radioisotope Techniques in Biology (3) $\mathbf{I}, \mathbf{1}$

One lecture and six hours of laboratory.
Prerequisites: Biology 1, 2, and 15; Chemistry 1A and 1B; Physics 2A, 2B, 3A and 3B. Recommended: Chemistry 4 or 5, and Biology 101.
The principles and application of radioisotopes in biology. Radionuclide measurement, safe handling, tracer and radioautography techniques.

## 155. Genetics (4) i, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1, 2, and 15
Principles of plant and animal genetics, with experiments and demonstrations Principles the mechanisms of heredity.

## 156. Developmental Biology (4) I, il

Two lectures and six hours of laboratory.
Prerequisites: Biology 155 and Chemistry 11 or 12. Recommended: Biology 101 Analysis of development with emphasis on embryonic differentiation.

## 157. Cytogenetics (4) I

Two lectures and six hours of laboratory.
Prerequisite: Biology 155.
The physical basis of heredity. Study of the chromosomes and chromosome behavior in relation to problems in heredity and evolution.

Two lectures and six hours of laboratory.
Prerequisite: Biology 155.
Genetics as related to human biology, with consideration of the applied fields of medical genetics, genetic counseling, and population studies.

## 159. Human Heredity (3) I, II

Prerequisite: Biology 1.
Selected principles of human inheritance with emphasis on relationships to other Selected principles of hot open to students with credit in Biology 155 or 158.
160. Experimental Evolution (3)

Two lectures and three hours of laboratory.
Prerequisite: Biology 155.
The theories of evolution and speciation and the methods of study of modern problems.
161. History of Biology (3) I, II

Prerequisite: A college course in biology
Lectures and reports tracing biological scientific development, with emphasis on in the history of biology may be counted for the times. Not more than three unit

## 162. Source Material in the History of Biology (3)

Prerequisite: Biology 161.
A study of original papers of significance to the history of biology. Not mor than three units in the history of biology may be counted for graduate credit
163. Microbial Genetics (4) I, I

Two lectures and six hours of laboratory.
Prerequisite: Biology 155. Microbiology 101 is recommended
The design, methods and execution of research in microbial genetics
165. Biology of Natural Populations (3) I, II

Prerequisite: A college course in Biology
The relation of modern concepts of
populations with emphasis on the problems of human and physiology to natural najors in the biological sciences.

167A-167B. Biology for Teachers (4-4)
Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2.
Advanced study of biological principles including classification, physiology for elementary or secondary teaching curricul for those electing a biology mino the elementary or secondary teaching curricula. Not open to students majoring in
the
sciences.
169. Population Genetics (3) il

Two lectures and three hours of laboratory.
Prerequisites: Biology 15 and 155, Mathematics 22 or 50
Discontinuous and continuous variation in natural populations.
170. Contemporary Problems in Biology (1) s

A series of six weekly lectures on varied aspects of biology by scientists engage in research. Reading and reports required of students enrolled for credit. These

## 171. Mutagenesis (3)

Prerequisite: Biology 155.
Basic principles and applications of mutation induction, chemicals and ionizing radiations.
175. Statistical Methods in Biology (3)

Two lectures and three hours of laboratory
Prerequisite: Biology 101, 110 or 155.
Application of statistical techniques to biological data. Not approval of the chairman of the departmentse in statistics except with students filed with the Evaluations Office.
181. Advanced Cellular Physiology (3) I, II

Prerequisite: Biology 101.
Current topics in cellular physiology.
190. Senior Investigation and Report in Physiology (2) I, I

Prerequisites: Biology 101, senior standing and consent of instructor
Investigation and reports on current physiological literature.
191. Senior Investigation and Report in Ecology (2) I, II

Prerequisites: Biology 110, senior standing and consent of instructor
Investigation and reports on current ecological literature.
195. Senior Investigation and Report in Genetics (2) I, II

Prerequisites: Biology 155, senior standing and consent of instructor.
Investigation and reports on current genetic literature.
198. Methods of Investigation (2) I, II

One hour of discussion and three hours of laboratory.
rerequisites: Junior standing and a major in the Division of the Life Sciences.
Individual and original investigations in biology; class reports. Four units maximum credit for Biology 198 or a combination of this course with Microbiology or Zoology 198
200. Seminar (2 or 3)
210. Seminar in Cellular Physiology (2)
220. Seminar in Developmental Biology (2)
221. Developmental Genetics (3)
222. Morphogenesis (3)
230. Speciation (3)
231. Seminar in Ethology and Comparative Psychology (3)
240. Seminar in Terrestrial Ecology (2)
241. Seminar in Aquatic Ecology (2)
242. Population and Community Ecology (3)
243. Physiological Ecology (3)
244. Physical Aspects of Ecology (3)
245. Aquatic Ecology (3)
246. Behavioral Ecology (3)
250. Biogeography (3)
260. Seminar in General Physiology (2)
261. Seminar in Environmental Radiation (2)
262. Cytoplasmic Inheritance (3)
263. Seminar in Comparative Physiology (2)
264. Methods in Physiology (2)
265. Molecular Biophysics (3)
270. Seminar in Genetics (2)
291. Investigation and Report (3)
297. Research (1-3)
298. Special Study (1-3)
299. Thesis (3)
have approval of the adviser for biology teaching prograt. (Sie tir course work toward completion of a minor may be substituted fort of graduate
ment.)

1. Plants and Man (3) I, II

Basic structure and
of plants and man.
100. General Botany (4) I, II

Two lectures and six hours of laboratory.
Prerequisite: Biology 1 and 2.
duction and evolution of the major plant groups. Structure, physiology, repro-

## 101. Phycology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2.
Morphology and phylogenetic relationships of the algae.

## 02. Mycology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2.
The structure, food relations, and classification of fungi.

## 03. Vascular Plants (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2.
Structure, development and phylogenetic relationships of the Bryophytes and
vascular plants.

## 112. Cultivated Trees and Shrubs (3) I

One lecture and six hours of laboratory and field work
Prerequisites: Biology 1 and 2. Botany 114 is recommended
Identification of the
Identification of the common cultivated trees and shrub.
region. Trips to local parks and private gardens. and shrubs of the San Diego
114. Systematic Botany (4) II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2 ; and either 110 or 155 . Botany 103 recommended
Kinds, relationships, systematic arrangement, and geographical distribution
vascular plants; collection and identifict
vascular plants; collection and identification.
18. Piant Study of the California Deserts (3)

Formerly X-119. Offered in Extension only.
One lecture and six hours laboratory. Field trips arranged

## 119. Field Botany (4) s

Two lectures and six hours of laboratory.
Prerequisite: A course in college biological science or consent of instructor,
Local native vegetation with emphosis Primarily for students not majoring in the College of of Sciences within floristic areas.

## 126. Plant Pathology (4) I

Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2. Botany 102 recommended,
Ares, and quartical course dealing with the principles of disease in plante control measures of those pathogenic organisms placed on the determination measshrubs and nursery stock.

## Business Administration

See "School of Business Administration" in the catalog section Professional Schools: Courses and Curricula.

## Chemistry

## In the College of Sciences

The department is on the approved list of the American Chemical Society. Faculty
Professors: Grubbs, Harrington, N., Hellberg, Isensee, Jensen, Jones, W., Joseph,
Landis, Malik, O'Neal, Richardson, W., Ring, Robinson, D., Rowe, Sharts,
Spangler, Stew Spangler, Stewart, C., Wadsworth (Chairman), Walba, Wick,' Woodson Associate Professors: Abbott, Bennett, Mathewson
Assistant Professors: Coffey, Malley, Roeder

## Offered by the Department

Doctor of Philosophy in chemistry.
Master of Arts in chemistry.
Master of Arts, teaching service, with concentration in chemistry.
Master of Science in chemistry.
Major in chemistry with the B.S. in applied arts and sciences with the Certificate
of the American Chemical Society.
or the American Chemical Society.
Major in chemistry with the A.B. in applied arts and sciences, with or without
the Certificate of the American Chemical Society. Major in chemistry wimerican Chemical Society.
Minor in chemistry.
Teaching major in chemistry, with specialization in both elementary and sec-
ondary teaching.
Teaching minor in chemistry, with specialization in both elementary and sec-
ondary teaching.

## Major

With the B.S. Degree in Applied Arts and Sciences
and Certificate of the American Chemical Society
The curriculum outlined below for the B.S. degree in applied arts and science is based upon the recommendations of the Committee for Professional Training of Chemists of the American Chemical Society. It qualifies graduates for many type
of positions as chemists and provides the training required by of positions as chemists and provides the training required by most universities for
admission to graduate work in chemistry. prion
Preparation for the major. Chemistry 1A-1B, 5, 12, and 13; Physics 4A-4B-4C;
nd Mathematics 50 , 51 , and 52 . (44 units.) Major. A
$110 \mathrm{~A}-110 \mathrm{~B}, 111,112,113,127 \mathrm{~A}, 155$, one unit of 198 ; and 14 to include Chemistry electives in chemistry or in related subjects with approval of the upper division Foreign language requirement. German 8 A or Russian 8 A .

OUTLINE FOR THE B.S. DEGRE AND CERTIFICATE

| First year | Units 1st 2nd Sem. Sem. | Second year | Units <br> 1st 2nd <br> Sem. Sem. |
| :---: | :---: | :---: | :---: |
| Chemistry 1A-1B | 55 | Chemistry 5 | 4 - |
| $\dagger$ Mathematics 4, 40, 50 | $5 \quad 5$ | Chemistry 12-112 | 4 |
| Physics 4A | 4 | Chemistry 13-113 | 1 |
| -Basic Subject | 3 | Mathematics 51, 52 | 4 |
| ${ }^{\text {- }}$ Social Sciences | 33 | Physics 4B, 4C | 44 |
| ${ }^{\bullet}$ Physical Activities | 1/2 1/2 | German 1 or Russian 1 |  |
|  | $161 / 2171 / 2$ | 龶 | 1/2 $1 / 2$ |
|  |  |  | $171 / 2171 / 2$ |
|  | Units |  | Units |
|  | 1st 2nd |  | 1st 2nd |
| Tbird year | Sem. Sem. | Fourth year | Sem. Sem. |
| Chemistry 110A-110B | 3 | Chemistry 111 | 3 |
| Chemistry 155 | - 4 | Chemistry 198 | 1 |
| German 2, 8A, or |  | Chemistry 127A | 3 |
| Russian 2, 8A | 2 | Chemistry Electives | 86 |
| $\ddagger$ American Institutions | 3 | General Electives | 7 |
| ${ }_{\text {§ }}$ Biology ${ }^{1}$ | 3 |  |  |
| ${ }^{*}$ Humanities | 3 |  | $15 \quad 13$ |
|  | $16 \quad 15$ |  |  |

Refer to Catalog section on General Education requirements.
+Students eligible to take Mathematics 50 in their first semester should do so and substitute for $\ddagger$ If this requirement is met by examination the appropriate number of units should be added § Premedical and predental students will also take Biology 2 and decrease general elective units

With the A.B. Degree in Applied Arts and Sciences and Certificate of the American Chemical Society
Preparation for the major. Chemistry 1A-1B, 5, 12, and 13; Physics 4A-4B-4C; and Mathematics 50,51 , and 52 . (44 units.)
Major. A minimum of 24 upper division units in chemistry to include Chemistry $110 \mathrm{~A}-110 \mathrm{~B}, 111,112,113,127 \mathrm{~A}, 155$, one unit of 198; and two units of upper division electives in chemistry to be chosen from Chemistry 116A, 118, 127B, 131, 154.

Foreign language requirement. German 8 A or Russian 8 A .


## Minor

The minor in chemistry for the bachelor's degree consists of Chemistry 1A-1B, 4 or 5,12 , and six upper division units in chemistry ( 24 units).
The minor in chemistry for the standard teaching credential, with specialization in either elementary or secondary teaching, consists of not less than 20 units in hemistry, six units of which must be in upper division courses. If the major for must be taken. All courses must be approved by the chemistry adviser for teach ing programs.

## A-1B. General Chemistry (5-5) I, II

Three lectures and six hours of laboratory.
Prerequisites: High school chemistry and two years of college preparatory mathematics. Recommended: High school physics and two years additional mathematics.
General principles of chemistry with emphasis on inorganic materials. Qualitative analysis is included in the second semester. Duplicate credit will not be allowed for the corresponding course in Chemistry $10 \mathrm{~A}, 10 \mathrm{~B}$, or 1 E . Students with credit for both Chemistry 1A and 2A will receive a total of 5 units of credit toward graduation.
1E. General Chemistry for Engineers (3) I, II
Two lectures and three hours of laboratory.
Prerequisite: Chemistry 1A.
A continuation of the study of the principles of chemistry with emphasis on the relationships to the field of engineering. Open only to engineering majors. Not open to students with credit in Chemistry 1B.

## 2A. Introductory General Chemistry (3) I, II

Two lectures and three hours of laboratory.
Elementary principles of chemistry. Not open to students with credit in Chemistry 1A.
2B. Elementary Organic Chemistry (3) I, II
Two lectures and three hours of laboratory.
Prerequisite: Chemistry 2A or 1A.
Introduction to the compounds of carbon including both aliphatic and aromatic substances. Not open to students with credit in Chemistry 1B or 1E.
3. Introductory Biochemistry (3) I, II

Formerly Chemistry of Nutrition.
Three lectures with demonstrations.
Prerequisites: Chemistry 2A-2B.
Fundamental principles of the chemistry of living processes. This course intended primarily for majors in home economics, nursing, and related fields.
4. Elementary Quantitative Analysis (4) I, II

Two lectures and six hours of laboratory
Prerequisite: Chemistry 1B or 2B.
Fundamentals of volumetric and gravimetric analysis. Not applicable to the B.S and the A.B. degree and certificate for chemistry majors. Not open to students with credit in Chemistry 5.
5. Analytical Chemistry (4) $\mathbf{I}$, II

Two lectures and six hours of laboratory.
Prerequisites: Chemistry 1B; and credit or concurrent registration in Mathematics 22 or 50.
Theory and practice of volumetric, gravimetric and electrical methods of analysis. Not open to students with credit in Chemistry 4. Duplicate credit will not be allowed for equivalent work in Chemistry 10A-10B.

10A-108. Chemical Principles and Techniques (Honors) (5-5)
Three lectures and six hours of laboratory.
Prerequisites: An outstanding record in high school chemistry, physics, and and the college Mathematics Placement Examinations the College Aptitude Test The application of modern Placement Examinations
with emphasis in the laboratory on analytical methods, Qudy of general chemistry analysis is included. Chemistry $10 \mathrm{~A}-10 \mathrm{~B}$ takes the place of Cuative and quantitative 5 for these students as prerequisites for further courses in Chemistry 1A-1B and
11. Introductory Organic Chemistry (4) I, II

Three lectures and three hours of laboratory.
Prerequisite: Chemistry 1B.
Aliphatic and aromatic compounds including reaction mechanisms. For students in Chemistry 12.
2. Organic Chemistry (4) I, II

Three lectures and three hours of laboratory.
Prerequisite: Chemistry 1B.
Properties and synthesis of organic compounds including reaction mechanisms.
First half of a year course.
13. Organic Chemistry Laboratory (1) $\mathbf{I}$, 1

Three hours of laboratory.
Prerequisite: Open only to students enrolled concurrently in Chemistry 12
The theory and practice of laboratory operations.
22. Glass Blowing (1) I, II

Three hours of laboratory.
Prerequisite: Chemistry 1B.
Elementary training in the manipulation of glass.

109A-109B. Fundamentals of Physical Chemistry (3-3)
Prerequisites for 109A: Chemistry 4, Mathematics 22, and Physics 2B and 3B. Not
open to students with credit in Chemistry Prerequisites for 109B.
Chemistry 150. Not open to students with and credit or concurrent registration in Fundamental principles of theoretical with credit in Chemistry 110B.
A.B. and certificate or B.S. major in chemistry.

109C. Fundamentals of Physical Chemistry Laboratory (2) II
Six hours of laboratory.
Prerequisite: Concurrent registration or credit in Chemistry 109B. Not open to tudents with credit or concurrent registration in Chemistry 111 .
Physico-chemical experiments, errors of measurement and technical report writing

110A-110B. Physical Chemistry (3-3) I, II
Prerequisites for 110A: Chemistry 5 and credit or concurrent registration in Physics 4C and Mathematics 52. Not open to students with credit in Chemistry
Prerequisites for Chemistry 110B: Chemistry 110A. Not open to students wit redit in Chemistry 109B.
Theoretical principles of chemistry with emphasis on mathematical relations.

Chemistry

## 11. Physical Chemistry Laboratory (3) I, II

Nine hours of laboratory.
Prerequisite: Credit in Chemistry 110B or concurrent registration with consent of instructor. Not open to students with credit or concurrent registration in Chemtry 109C.
Physico-chemical apparatus and measurements, with emphasis on technical report writing.
112. Organic Chemistry (4) I, II

Three lectures and three hours of laboratory.
Prerequisite: Chemistry 12.
A continuation of Chemistry 12

## 113. Organic Chemistry Laboratory (1) I, II

Three hours of laboratory.
Prerequisite: Open only to students enrolled concurrently in Chemistry 112
Theory and practice of laboratory operations.

## 14A-114B. Cinical Biochemistry (4-4)

Two lectures and six hours of laboratory.
Prerequisites: Chemistry 4 or 5 and 11 or 12.
Principles of biochemistry and analytical methods applied to blood, urine, and other body fluids. This course cannot apply to the major in chemistry.

## PA-11s. Fundamentais of Biochemistry (3-3) I, II

Prerequisites: Chemistry 4 or 5 , and 11 or 12.
dents with credit in Chemistry $116 \mathrm{~A}-116 \mathrm{~B}$.
116A-116B. General Biochemistry (3-3)
Prerequisites: Chemistry 109B or 110B, and 112.
The structure, function, metabolism, and thermodynamic relationships of chem ical entities in living systems. Not open to students with credit in Chemistry 115A-
117. Biochemistry Laboratory (2) I, II

Six hours of laboratory.
Prerequisite: Credit or concurrent registration in 115B or 116B
The theory and practice of laboratory procedures used in the study of intermediary metaboism. Includes the purification of enzymes, radioactivity trace echniques, and the isolation of cell components.

## 8. Advanced Physical Chemistry (3) II

Prerequisite: Chemistry 110B.
Chemical statistics, solid state theory, transport phenomena, chemical kinetics in solution and additional selected topics in modern physical chemistry.

## 127A. Inorganic Chemistry (3) I, II

Prerequisite: Credit or concurrent registration in Chemistry 109B or 110B.
The physical basis of the periodic system, complex inorganic compounds, and the nature of the chemical bond.

## 27. Inorganic Chomistry (3) i,

Prerequisite: Chemistry 127A.
An advanced systematic study of representative and transition elements and their ompounds.

## 131. Theoretical Organic Chemistry (3) I, II

Prerequisites: Chemistry 109A or 110A and 112.
The application of modern electronic theory to the physical and chemical prop-
135. CHEM Study (3) II

One lecture and six hours of laboratory.
Prerequisites: Chemistry 1B.
New approach to the study of major concepts of chemistry. Based on lecture Committee. Open only to secondary by the Chemical Education Materials Study Committee. Open only to secondary teacher candidates.
150. Analytical Chemistry (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Chemistry 4 or 5,12, and 109A or 110A.
Advanced theory and practice of quantitative analysis and an introduction to
instrumental methods of analysis.

## O4. Organic Qualitative Analysis (3) 1, II

One lecture and six hours of laboratory.
Prerequisites: Chemistry 112 and credit or concurrent registration in Chemistry
09 A or 110 A .
The identification of organic compounds and mixtures.
155. Advanced Instrumental Methods (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Chemistry 5,112, and credit or concurrent registration in 110B. Not open to students with credit for Chemistry 150.
Advanced theory and practice of chemical instrumentation.
160A-1608. Principles of Chemical Engineering (3-3)
(Same course as Engineering 160A-160B)
Prerequisite: Credit or concurrent registration in Engineering 108 or Chemistry
109A or 110A.
Industrial stoichiometry; fluid flow and heat transfer as applied to unit opera-
ions such as evaporation, distillation, extraction, filtration, gas-phase mass tions such as evaporation, distillation, extraction, filtration, gas-phase mass transfer,
drying, and others. Problems, reports, and field trips.

## 70. Radiochemistry (3) I,

One lecture and six hours of laboratory.
Prerequisite: Chemistry 4 or 5 .
Laboratory principles and techniques of radioactivity applied to the various fields chemical investigation of the actinides, study of nuplications, activation analysis,
180. Chemical Oceanography (3) II

Three lectures and occasional field trips.
Prerequisite: Credit
The application of the fundaren 109B or 110B.
191. Chemical Literature (1)

Prerequisite: Upper division standing in chemistry
An introduction to the availability, scope and use of the chemical literature,
196. Selected Topics in Chemistry ( $1-3$ )

Prerequisite: Consent of instructor.
Selected topics in modern chemistry. May be repeated for additional credit with
198. Senior Project (1-3) I, II

Prerequisites: Three one-year courses in chemistry and senior standing,
An individual investigation and report on a problem. May be repeated to a
maximum of six units. 200. Seminar ( 1 to 3)

Classical and Oriental Languages

## In the College of Arts and Letters

## Faculty

Emeritus: Burnett
Professor: Warren, E. W.
Associate Professors: Ingham, Schaber (Chairman)
Assistant Professors: Eisner, Genovese
Lecturers: Gefter, Kobayashi, Woo

## Offered by the Department

Major in Classics with the A.B. degree in liberal arts and sciences.
Minor in Classics.
Teaching minor in Humanities. See "School of Education" in the catalog section Professional Schools, Courses and Curricula.
Teaching minor in Latin.

## Classics Major

With the A.B. Degree in Liberal Arts and Sciences

## Concentration in One Language

Preparation for the major. Greek 1 and 2; or Latin 1, 2, and 3 (8 or 12 units). Major. Thirty or 33 upper division units to include Comparative Literature 102A-102B; History 111A-111B; Philosophy 101; 18 units of Greek or 15 units of Latin.

## Concentration in Two Languages

Preparation for the major. Greek 1 and 2; or Latin 1, 2, and 3 (8 or 12 units) Major. Thirty-six upper division units to include Comparative Literature 102A

## Classics Minor

The minor in classics consists of 18 units, of which nine units must be chosen from the following: Greek 103, 104, 105, 106, 199; Latin 104, 105, 106, 107, 199 Art 153; History 111A, 111B; Philosophy 101; Comparative Literature 102A, 102B The student must have 12 units of Greek or of Latin; he may fulfill part of this requirement in high school.

## Latin Minor

## For the Standard Teaching Credentia

The minor in Latin for secondary teaching consists of 20 units of Latin, at least six units of which must be in upper division courses (exclusive of course equivalents

## High School Equivalents

High school foreign language courses may be used for purposes of placement in college courses and may be counted toward meeting the foreign language requirement in various majors. These high school courses will not count as college credit
toward graduation.

The first two years of high school Latin may be counted as the equivalent of Latin 1; three years the equivalent of Latin 2; and four years the equivalent of Latin 3. The last year-course taken by a student in the high school language se quence may be repeated in college for graduation credit, not to exceed four units of repeated foreign language work.

## Courses in Translation

See English, History, and Philosophy.

## Chinese

## 1. Elementary (4)

Four lectures and one hour of laboratory.
Pronunciation, oral practice, readings on Chinese culture and civilization, minimum essentials of grammar.
2. Elementary (4)

Four lectures and one hour of laboratory.
Prerequisite: Chinese 1.
Continuation of Chinese 1.
3. Intermediate (4)

Prerequisite: Chinese 2
A practical application of the fundamental principles of grammar. Reading in Chinese of cultural material, short stories, novels or plays; oral practice; outside reading with oral and written reports.
4. Infermediate (4)

Prerequisite: Chinese 3.
Continuation of Chinese 3. Reading of selections from Chinese literature

## Greek

1. Elementary (4) I

Four lectures and one hour of laboratory.
Introduction to ancient Greek, emphasizing grammatical foundations of New Testament and Attic Prose

## 2. Elementary (4) II

Four lectures and one hour of laboratory
Prerequisite: Greek 1.
Continuation of Greek grammar with selections from St. John, Herodotus, and Plato. Interpretation, style and grammar.

## 103. Readings in Ancient Greek (3) I

Prerequisite: Greek 2.
Graded readings from the masters of Greek prose and poetry. Emphasis on rapid reading.
104. Readings in Ancient Greek (3) I

Prerequisite: Greek 103
Intensive study of one or more major writers, such as Plato, Euripides, and Demosthenes. Author selected in consultation with students.
105. Greek Poetry (3)

Prerequisite: Greek 104.
Literary, linguistic, and cultural themes among the Greek poets. Contributions of the Greeks to later ages. May be repeated with new content. Maximum credit
six units.
106. Greek Prose Writers (3)

Prerequisite: Greek 104
Origin and development of the genre of each author and his literary, philosophical, or political contribution to western civilization. May be repeated with new content. Maximum credit six units.

## Hebrew

1. Elementary (4) I

Four lectures and one hour of laboratory.
Pronunciation, oral practice, readings in Hebrew culture, essentials of grammar.
2. Elementary (4) II

Four lectures and one hour of laboratory.
Prerequisite: Hebrew 1.
Continuation of Hebrew 1
3. Infermediate (4) I

Prerequisite: Hebrew 2.
Application of fundamental principles of grammar. Readings in Hebrew cul-
tural material, oral practice.
4. Intermediate (4) II

Prerequisite: Hebrew 3.
Continuation of Hebrew 3

## Japanese

1. Elementary (4)

Four lectures and one hour of laboratory.
Pronounciation, oral practice, readings on Japanese culture and civilization, mini-
mum essentials of grammar.

## 2. Elementary (4)

Four lectures and one hour of laboratory.
Prerequisite: Japanese 1.
Continuation of Japanese 1

## 3. Infermediafe (4)

Prerequisite: Japanese 2.
A practical application of the fundamental principles of grammar. Reading in reading with oral and written reports.
4. Intermediate (4)

Prerequisite: Japanese 3.
Continuation of Japanese 3. Reading of selections from Japanese literature.

## Latin

1. Elementary (4) I

Four lectures and one hour of laboratory.
Study of the language and Roman culture, with reading of selected prose pas-
sages. sages.

## 2. Elementary (4) II

Four lectures and one hour of laboratory
Prerequisite: Latin 1 or two years of high school Latin.
Continuation of Latin 1.

## Drama

## In the College of Professional Studies

Faculty
Professors: Amble, Powell (Chairman), Stephenson
Associate Professor: Howard, G
Assistant Professors: Annas, Harvey, M., Lessley, Owen

## Offered by the Department

Master of Arts in drama.
Major in drama with the A.B. degree in applied arts and sciences. Minor in drama.
Teaching major in drama with specialization in secondary teaching
Teaching minor in drama with specialization in both elementary and secondary
teaching.

## Major

## With the A.B. Degree in Applied Arts and Sciences

Preparation for the major. Drama 30,31, 40,50, and Telecommunications and
Film 1 or 70 . (15 units.) (1)
ments
Maior A minimum of 24 uper 1 . .
Maior. A minimum of 24 upper division units in drama to include Drama $120, ~$ Drama 142 and 199) selected with the approval of electives in drama (excepts
In addition to course requirements the stent madviser,
Major Theatre performances and three Studio or Experimental Theatre ital of five

## Emphasis in Design for Drama

Preparation for the major. Drama 30 or $31,40,50$, and Telecommunications
and Film 3. (12 units.) Note: Drama 5 and 10 should be taken as part of the General Education re
Major. A minimum of 24 upper division units in drama to include Drama 127 A
$40 \mathrm{~A}, 140 \mathrm{~B}, 145 \mathrm{~A}, 148,152 \mathrm{~A}, 160 \mathrm{~A}, 160 \mathrm{~B}$. In addition to tudent must participate in a $160 \mathrm{~A}, 160 \mathrm{~B}$. In addition to course requirements 127 A three Studio or Experimental Theater activities. Major Theater performances and

## Emphasis in Design for Television

Preparation for the major. Drama 40,50 , or Telecommunications and Film 20,
elecommunications and Film 3,56, and 83 , Telecommunications and Film 3, 56 , and 83 . ( 15 units.)
Major. A minimum of 24 upper division units to include Drama 101, 140A, 140B 50, 156, and 162 or 184 .

## For the Standard Teaching Credential, with Specialization

 in Secondary TeachingPreparation for the major. Drama 30,31, 40, 50, and Telecommunications and
Film 1 or 70 . (15 units.) Note: Drama 5 and 10 should be taken as part of the General Education re-

Teaching major (undergraduate). A minimum of 24 upper division units to include Drama 120, 127A, 128, 132, 140A, 160A, 160B, and five units of electives in drama (except Drama 142 and 199) selected with the approval of the adviser.
Postgraduate Year. Six upper division or graduate units selected from the folPostgraduama 109, 121, 122, 131, 145A-145B,148, 152A or any 200 -numbered course in drama with the approval of the adviser.

## Minor

The minor in drama for the bachelor's degree and for the standard teaching redential consists of 21 units in drama to include Drama 5, 30 or 31, 40, 50, and nine upper division units in drama

## 5. Introduction to the Theatre (3) I, II

A survey of theory and practice in the contemporary theatre, including its literary, critical, and technical aspects viewed against historical backgrounds. Attendance at selected rehearsals and performances required. (Formerly numbered Speech Arts 5.)
8. Verse Choir (2) I, II

Three hours.
Participation in verse speaking chorus to develop quality, range of tone, and ability in dramatic visualization of poetry. Lectures and readings on the nature, artistic function and history of the Verse Choir. Maximum credit four units, including lower division and upper division courses 8 and 108. (Formerly numbered
Speech Arts 63.)
10. Voice and Diction (3) I, II

Exercises and drills to improve the quality, flexibility and effectiveness of the speaking voice leading to good usage in standard American speech. Preparatory to further courses in drama. (Formerly numbered Speech Arts 1.)

## 30. Elementary Acting (3) $\mathbf{I}$,

Three lectures per week and 30 hours of laboratory per semester.
Development of the individual's ability to express thought and emotion through the effective use of the voice and body. These fundamental skills may be applied to stage, radio, and television acting. (Formerly numbered Speech Arts 55A.)

## 31. Intermediate Acting (3) I, II

Three lecture-demonstrations per week and 30 hours of laboratory per semester. Prerequisite: Drama 30
Continuation of Drama 30, emphasizing the application of fundamental skills to the problems of emotion, timing, characterization, and ensemble acting. (Formerly numbered Speech Arts 55B.)
32. Movement and Mime for the Theatre (3) I

Basic disciplines of locomotor and axial body movement for the stage director and actor; introduction to mime. The relationship between body expression and character portrayal. (Formerly numbered Speech Arts 32)

## 4. Dramatic Production (3) I, 1

Two lectures and three hours of laboratory.
Technical practices and organization of production for theatre and television. Practice in drafting and construction of scenery for the college productions. (ForPractice in drafting and construction
merly numbered Speech Arts 56.)
47. Sound in the Theatre (2) I

One lecture and three hours of laboratory.
Techniques, theory, and procedures necessary to develop sound, music, and effects integrated into theatre production. (Formerly numbered Speech Arts 57 .)
50. Elementary Stage Costume and Makeup (3) I

Two lecture-demonstrations and three hours of activity.
Principles and application of makeup for stage, film, and television. Pattern training in the construction of stage costumes and for stage costuming. Practical partmental productions. (Formerly numbered Speet application of makeup for de-
101. Management of Drama Activities (1) I, II
vals and other interscholastic and intrascholastic susion of drama tournaments, festithe drama staff, Maximum

## 108. Advanced Verse Choir (2) I, II

Three hours.
Participation in verse speaking chorus to develop quality, range of tone, and
ability in dramatic visualization of ability in dramatic visualization of poetry. Lectures and reading on the nature,
artistic function and history of the Verse Choir, with a written artistic function and history of the Verse Choir, with a written report or project and 108. (Formerly numbered Speech Arts 163.)
109. Verse Choir Directing (2 or 3)

Organizing a given group as a Verse Choir, considering age, voice quality, back ground, selection and arrangement of material, and techniques of directing. Demon stration and practice of techniques to improve speech through the Verse Choir (Formerly numbered Speech Arts 164.)

## 110. Creative Dramaties (2) I, II

Practical training in the principles and techniques of creative dramatization for work with children in the classroom and recreation. Emphasis on the developmen numbered Speech Arts 110.)

## 120. Play Analysis (3) I, I

The structure and style of drama. Several short plays and one full-length play are read, discussed and analyzed. (Formerly numbered Speech Arts 118A.)
121. Theatre Criticism (3) I

Prerequisites: Drama 5 and 120
A consideration of the problems and practices of dramatic criticism as applied to 116.)
122. Playwriting, the One-Act Play (3) I, II

Lectures, discussion and reading of one-act plays written by the students. (For-
merly numbered Speech Arts 118B.)
23. Playwriting, the Long Play (3) It

Prerequisite: Drama 122.
Lectures and analytical discussions of full-length plays written by students. (For

## 124. Script Writing for the Musical Theatre (3)

Prerequisite: Drama 122.
Lectures, analytical discussions, and readings of one-act and full-length scripts .
125. Original Dramatic Works: Production Laboratory (3)

Nine hours of laboratory.
Prerequisites: Drama 30, 31, and consent of instructor
Staging of original one-act and full-length plays, in traditional and experimental
productions, working in conjunction with directing classes. (Formerly numbered Speech Arts 126.)

126. Theory of Production for the Musical Stage (3) I

Prerequisites: Drama 31 and consent of instructor. Theory and principles of production of modern musicals. (Formerly numbered Speech Arts 125.)

## 127A-127B. Stage Direction (3-3) I, II

Prerequisite: Drama 127A is prerequisite to 127B.
Planned for prospective directors of plays in schools, colleges and community theatres.
A. Composition, picturization and movement for the stage director.
B. Advanced problems of composition and motivations for movement.
(Formerly numbered Speech Arts 159A-159B.)

## 128. Stage Direction Laboratory (1) I, $\mathbf{I}$

Prerequisites: Credit or current registration in Drama 127A or 127B
Experience in directing a one-act play before a departmental or public audience. Maximum credit two units. (Formerly numbered Speech Arts 160.)

## 130. Accents and Dialects for the Stage (3) II

Prerequisite: Drama 30.
Various accents and dialects most frequently occurring in stage productions.

## 131. Advanced Acting Theory (3) I, II

Prerequisite: Drama 30 or 31.
The theories and principles of acting. (Formerly numbered Speech Arts 153.)

## 132. Advanced Acting (3) I, II

Prerequisite: Drama 31
Problems in characterization: Acting styles of the great periods in theatre history. (Formerly numbered Speech Arts 155. )

## 140A. Scenic Design (3) I

Prerequisite: Drama 40.
Techniques and procedures in the application of principles of design, color and erspective in the designing and painting of scenery for various types of produc-

140B. Styles in Scenic Design (3) if
Prerequisite: Drama 140A.
History of scenic design and the application of contemporary styles to various ypes of dramatic production for stage, television and cinema. (Formerly numbered types of dramatic p.

## 142. Theatre Workshop (2) I, II S (3 or 6)

Two hours of activity per unit.
A laboratory to give the student a variety of experience in the theatre including acting, lighting, scenery, costumes and stage management. Maximum credit six units. (Formerly numbered Speech Arts 142.)

## 145A-145B. Stage Lighting (3-3) I, 1

Two lectures and three hours of laboratory.
Prerequisite: Drama 145A is prerequisite to 145 B
Light, color, lighting instruments, and control equipment, including the design and planning of lighting for plays. (Formerly numbered Speech Arts 145A-145B.)

## 148. Advanced Dramatic Production (3)

Two lectures and three hours of laboratory
Prerequisite: Drama 40.
Scenery drafting and construction, with attention to the multiple-set play. Planing of scenery construction and rigging for stage and television productions. (Formerly numbered Speech Arts 156. )

5-81517
151. Cosfume, Movement, and Manners (3) I

Prerequisite: Drama 50.
Interrelationship of period costumes on the movement and manners of the time and their application on the stage. (Formerly numbered Speech Arts 151.)
152A-152B. History of Costume (3-3) I, II
Two lectures and three hours of laboratory.
stage. (Speech Arts 152B may be taken without 152 A ) of historical costumes on the A. From primitive
B. 16th century to 20 th century.
(Formerly numbered Speech Arts 152A-152B.)

## 160A-160B. History of the Theatre (3-3) I, II

The theatre from primitive times to the present. Special attention will be given to the theatre as a mirror of the social and cultural background of the various countries and periods in which it is studied. Drama 160 B may be taken without 160A. (Formerly numbered Speech Arts 154A-154B.)

## 165. History of American Theatre (3) I, II

Prerequisites: Drama 160A or 160B, and consent of instructor.
American theatre and drama from Colonial times to the present day. Readings of plays and primary documents. Social and cultural background. (Formerly num-
bered Speech Arts 158.)

## 175. Theatre Management and Promotion (3) I, II

of practical and correlated study of the college and university theatre; principles of organization, programming, production, budgets, box office, and promotional
procedures.
198. Selected Topics in Drama (1-3) I, II

Prerequisite: Twelve units in Drama.
A specialized study of selected topics from the areas of drama. May be repeated
with new content. Maximum credit six units.
200. Research and Bibliography (3)
243. Seminar in Staging Practices for Theatre and Television (3)
244. Seminar in Stage Direction (3)
245. Seminar in Lighting for Stage and Television (3)
246. Seminar in Design for Stage and Television (3)
247. Seminar in History of Theatre and Drama (3)
248. Seminar in Dramatic Theory (3)
298. Special Study (1-3)
299. Thesis or Project (3)

## Economics

## In the College of Arts and Letters

## Faculty

Emeritus: Cameron, Ryan
Professors: Anderson, Babilot, Barckley (Chairman), Bridenstine, Flagg, Gifford, Leasure, McClintic, Turner, M.S.
Associate Professors: Chadwick, Clement, Madhavan, Poroy, Venieris
Assistant Professors: Bohmer, Jambleton, Hardesty, Kartman, Kudoh, Nam,
Phatak, Popp, Sebold
Lecturer: Ellsworth

## Offered by the Department

Master of Arts degree in economics.
Major in economics with the A.B. degree in liberal arts and sciences. Minor in economics.
Teaching major in economics, with specialization in secondary teaching.
Teaching minor in economics, with specialization in secondary teaching

## Major

With the A.B. Degree in Liberal Airts and Sciences
Two plans are provided for the major in economics: Plan A for those students expecting to pursue the study of economics beyond the A.B. degree; and Plan B for those students with a liberal arts interest or for those who are interested in pre-legal education or a combined economics-business program.

## Plan A

Preparation for the major. Economics 1A-1B (or 103A-103B) and 2. Recommended courses in related fields: Mathematics 40 and 50.
Major. A minimum of 24 upper division units in economics to include Economics $104 \mathrm{~A}-104 \mathrm{~B}, 107$, and 141 . Economics $103 \mathrm{~A}-103 \mathrm{~B}$ may not be used to fulfill minimal upper division requirements.
Minor. A minor is not required with this major; however, the student is strongly advised to take a minor in mathematics. Recommended courses are Mathematics 40 , $50,51,52,121 \mathrm{~A}-121 \mathrm{~B}, 140 \mathrm{~A}-140 \mathrm{~B}$, and $150 \mathrm{~A}-150 \mathrm{~B}$

## Plan B

Plan B is a flexible program to meet the needs of several groups of students, Advisory programs of study are available in the Economics Department office for Advisory programs of study are availabie in the Economics Department office for
the following groups: (a) pre-law majors; (b) a broad-ranging liberal arts interest; the foll (c) a combined economics and business interest.
Preparation for the major. Economics 1A-1B (or 103A-103B), and 2. Students planning careers in law or business are advised to take at least one semester of planning ca
Major. A minimum of 24 upper division units in economics to include Economics 100A-100B. Six of the 24 units may be in a related field to be selected with the approval of the departmental Academic Requer (Economic major.)

For the Standard Teaching Credential With

## Specialization in Secondary Teaching

Preparation for the major. Economics 1A-1B or 103A-103B, and 2. (9 units.)
Teaching, Major (Undergraduate). A minimum of 24 upper division units in eco-
omics to include Economics $100 \mathrm{~A}-100 \mathrm{~B}$. Economics $1033-103 \mathrm{~B}$ may nomics to include Economics $100 \mathrm{~A}-100 \mathrm{~B}$. Economics $103 \mathrm{~A}-103 \mathrm{~B}$ may not be used to fulfill minimal upper division requirements in the major.
Postgraduate Year. Six units of graduate courses in economics to be selected
with the approval of the department adviser. with the approval of the department adviser.

## Minor

The minor consists of 15 units in economics, nine of which must be upper division; Economics $103 \mathrm{~A}-103 \mathrm{~B}$ is not acceptable.
For the standard teaching credential for secondary teaching, it consists of units in economics, to include Economics 1A-1B or 103A-103B, and 15 upper divi-
sion units in

1A. Principles of Economics (3) it
An introduction to principles of economic analysis, economic institutions, and issues of public policy. In this semester the emphasis is upon macro-analysis in-
cluding national income analysis money stabilization. Not open to students with credit ing, Eusiness cycles, and economic

## 18. Principles of Economics (3) $\mathbf{1}, \mathbf{I I}$

Prerequisite: Economics 1A.
An introduction to principles of economic analysis, economic institutions, and issues of public policy. In this semester the emphasis is upon the direction of production, the allocation of resources, and the distribution of income, through the price system (micro-analysis); and international economics. Not open to students
with credit in Economics 103 B .

## 2. Statistical Methods (3) I, II

Prerequisite: Mathematics 3 or qualification on the Mathematics Placement Exam
nation. Itr
Introduction to descriptive statistics, statistical inference, correlation, index ind another course in statistics.

## 3. Current Topics in Economics (3) I

A non-technical course covering selected current policy issues and problem such as poverty, war and defense, educational economics, urban problems, and
economics of racial discrimination.
100A. Intermediate Economic Theory (3) I, II
Prerequisites: Economics 1A and 1B or 103A and 103B.
Economic theory with special reference to the theory of the firm and the in
dustry; value and distribution.

## 100B. Intermediate Economic Theory (3) I, II

Prerequisites: Economics 1A and 1B or 103A and 103B
Economic theory with special reference to national income analysis and the
heory of investment.

## 101. History of Economic Thought (3) i, it

Prerequisites: Economics 1A and 1B or 103A and 103B.
The development of economics. Contributions of schools of thought and in-
dividual writers are examined with regard to their dividual writers are examined with regard to their influence on economic theory
and policy.

Economics
102. Comparative Economic Systems (3) I, II

Prerequisites: Economics 1 A and 1 B or 103A and 103B.
The economic aspects of laissez-faire and regulated capitalism, co-operatives States, Great Britain. Criteria for evaluating economic systems. The individual and government in each system. Planning in a liberal capitalistic society.

103A. Economic Principles, Institutions, and Policies (3) I, II
Prerequisite: Six units in political science, history, or sociology.
Income and employment theory and its applications. Not open to students with credit in Economics 1A. May not be used to fulfill minimal upper division requirements in the economics major or minor or special major.
103B. Economic Principles, Institutions, and Policies (3) I, II
Prerequisite: Economics 103A or 1A.
Price theory and its applications. Not open to students with credit in Economics B. May not be used to fulfill minimal upper division requirements in the eco nomics major or minor or special major.

## 104A. Micro-Economic Analysis (3) I

Prerequisites: Economics 1A-1B (or 103A-103B) and Math 50.
Mathematical interpretation of micro-economic theory. Credit will not be given for both 100 A and 104A.

## 104B. Macro-Economic Analysis (3)

Prerequisites: Economics 1A-1B (or 103A-103B) and Math 50.
Mathematical interpretation of macro-economic theory. Credit will not be given for both 100B and 104B.

## 105. Welfare Economics (3) II

Prerequisites: Economics 1 A and 1B, or 103A and 103B, and 100A.
Theories of individual and social well-being; economic and ethical bases of optimum welfare arrangements; individual values and social decision-making; tests of improvement; interdependence and externalities; public and private sectors; prop-
erties of social welfare functions.

## 07. Quantitative Economics (3) I,

Prerequisites: Math 50 and Economics 1A-1B (or 103A-103B).
The quantitative approach to economic problems. The use of mathematics in conomic analysis.

## 09. Advanced Economic Theory (3) II

Prerequisites: Economics 107, and either 100A-100B or 104A-104B.
Recent contributions to the advanced theory of the firm, consumer demand, employment and growth.
10. Economic History of Europe (3) I

Prerequisites: Economics 1A and 1B or 103A and 103B.
Economic development from the Middle Ages to the present. Particular attenion is given to the impact of the Industrial Revolution on national economics, especially on England's commerce and industry.

## 11A-111B. Economic History of the United States (3-3)

Prerequisites: Economics 1A and 1B or 103A and 103B.
American economic development and national legislation in the fields of agriAmerican econo and commerce. Semester I: 1600-1865. Semester II: 1865 to the present.
112. Capitalist Economy (3)

Prerequisite: three units in economics.
The relationship between the dominant economic and political institutions of capitalist organization and the major social problems of modern capitalism.
114. Economic Problems of Latin America (3) I

Prerequisites: Economics 1A and 1B or 103A and 103B
Economic development, institutions, and problems of Latin America
115. Economic Problems of South and East Asia (3) I

Prerequisites: Economics 1A and 1B or 103A and 103B.
Economic development, institutions, and problems of China, India and Pakistan,
Japan, and Southeast Asia.
118. The Economies of the Soviet Union and Eastern Europe (3)

Prerequisites: Economics 1A and 1B, or 103A and 103B.
The development, institutions, and problems of the Soviet and East European
economies.
19. Economic Problems of Africa and the Middle East (3)

Prerequisites: Economics 1A and 1B or 103A and 103B
Economic development, institutions, and problems of Africa and the Middle
131. Public Finance (3) I, II

Prerequisites: Economics 1A and 1B or 103A and 103B.
Principles and practices of taxation and public
of public spending, debts and taxation. Financing public expenditures. Economic effects Fiscal policy and prosperity. Relation. Financing social security and other services on social problems involved. Relation to inflation and deflation. Special emphasis

## 132. Public Eeonomics (3)

Prerequisites: Economics 100A or 131.
General equilibrium. Externalities of consumption and production, their impact on allocative efficiency. Theory of social wants and public goods supply. Theo
retical treatment of individual and cond retical treatment of individual and community preference ordering and decision-
making. Proposals for improving the allocation of resources making. Proposals for improving the allocation of resources.

## 135. Money and Banking (3) I, II

Prerequisites: Economics 1A and 1B or 103A and 103B.
The elements of monetary theory. History and principles of banking with special
reference to the banking system of the United States, ntem of the United States
136. Policies for Macroeconomic Stabilization (3)

Prerequisite: Economics 1A or 103A.
Alternative policies for macroeconomic stabilization, including neo-Keynsian models, monetary vs. fiscal tools, economic surplus, and Gero forecasting, dynamic
138. Urban and Regional Economics (3) I

Prerequisites: Economics 1A and 1B or 103A and 103B
Major influences affecting city location and growth;
mental institutions in influencing residential and other uses private and govern siderations in appraising, managing, financing, marketing uses of land; major conof urban property. Discussion of San Diego problemseting, developing and taxation-

## 139. Location Theory (3)

Prerequisite: Economics 138.
The optimal location of economic activities. The effects of spatial distribution
of resources and markets on the locational equilibrium of the firm

## 141. Econometrics (3)

Prerequisites: Economics 2 and 107
Measurement in economics. The construction and testing of simple hypotheses. Use of economic models involving and testing of simple economi
142. Business Cycles (3) I

Prerequisites: Economics 1A and 1B or 103A and 103B.
Fundamental factors in economic fluctuations. Examination of business cycle theories, and various policy proposals for economic stabilization. A consideration of current economic conditions and an examination of methods employed in preparing national economic forecasts.

## 150. Jabor Problems (3) I, II

Prerequisites: Economics 1A and 1B or 103A and 103B.
Labor organizations and their policies, wages, strikes, unemployment, social insurance, child labor, labor legislation, plans for industrial peace, and other labor problems.

## 152. Collective Bargaining (3) II

Prerequisites: Economics 1A and 1B or 103A and 103B.
Structures of labor relations; management and union problems; public policy and collective bargaining; conditions of successful collective bargaining.

## 153. Comparative Labor Probiems (3)

Prequisite: Economics 1 A and in both dvanced and developing nations. Individual study of a particular country of the student's choice.
154. Economic Aspects of Human Resources (3) I, II

Prerequisites: Economics 1 A and 1B, or 103A and 103B.
A theoretical analysis of health, education, and manpower within the context of government expenditure, economic growth, and the theory of human capital.

## 67. Contemporary Issues (3) 1,1

Prerequisites: Economics 100A and 100B.
Current policy issues and problems from an economic point of view. Maximum credit six units. An undergraduate seminar.

## 70. Government and Business (3) I,

Prerequisites: Economics 1A and 1B or 103A and 103B.
Governmental activities affecting business; the state as an entrepreneur and manager; governmental assistance to business; governmental regulation of business in its historical, legal and economic aspects, including recent developments in the United States and abroad; proposed policies.

## 171. Transportation Economics (3)

Prerequisites: Economics 1A and 1B or 103A and 103B
Economic impact of the availability and cost of transportation services. Organizaion, rate-making practices, financing and regulation of transportation agencies: air, tion, rate-making practicre, and water. Current issues of national transportation policy.

## 172. Public Utilities (3) II

Prerequisites: Economics 1A and 1B or 103A and 103B.
Economics and regulation of utility enterprises. Growth, pricing, demand and cost behavior, financing, regulatory principles and techniques. Public power and cost behavior, financing, re
other current policy issues.

## 173. Economics of Ecology (3) II

Prerequisites: Economics 1A and 1B, or 103A and 103B.
Relation of ecological problems to basic economic institutions. Examination of he apparent conflict between economic needs and ecological requirements. Ecoresource utilization. Inves, ocean and land pollution, overpopulation and natural esource utilization. Investigation of possible solutions.
174. Economic Concentration and Monopoly Power (3) I

Prerequisites: Economics 1A and 1B or 103A and 103B.
The implications of economic concentration and monopoly. The evaluation of economic goals. Attempts to control ms of monopoly power in terms of social and regarding competitive practices and by other meaner by antitrust laws, by policies

## 175. Industry Studies (3) II

Prerequisites: Economics 1A and 1B or 103A and 103B.
Evaluation of the structure, conduct and performance of selected industries in
erms of social and economic goals.
185. Pove

Prerequisites: Eoverty in the United States (3) II
Prerequisites: Economics 1A and 1B, or 103A and 103B.
Economic aspects of poverty and racial discrimination. Relation of poverty to ployment and inflation. Possible solutions. loyment and inflation. Possible solutions.

## 189. Population and Economic Growth (3)

Prerequisites: Economics 1A-1B or 103A-103B.
tality, and migration) and the components of population change (fertility, areas.
190. International Economic Problems (3)

Prerequisites: Economics 1A-1B or 103A-103B. Not open to students with credit Economics 191 or 192
topics. (Formerly numbered Economics 192.)
191. internationai Trade Theory (3)

Prerequisites: Economics 100A-100B or 104A-104B.
bered Economics 190.)
192. International Monetary Theory and Policy (3)

Prerequisites: Economics 100B or 104B or 135
Balance of payments, international capital
relation to current theories and policies. (Formerly num and foreign exchange in
194. Capital and Growth Theory (3)

Prerequisites: Economics 100A-100B or 104A-104B.
Factors affecting the capital supply and the rate of growth of a developed
economy.
. Economics of Underdeveloped Areas (3)
Prerequisites: Economics 1A and 1B or 103A and 103B
for the economic development of underdevelopepment. Problems of and policies numbered Economics 196.
197. Research Design and Method (3) I

Prerequisites: Economics 2 and 107.
Instruction in the practical application of the various techniques of economic sources and limitations of basic data, surver reuntered in the economics profession forecasting, national impact studies, area and research, industry studies, economic

## is, anea and regional studies.

. Investigation and Report (3) I, II
Open to economics majors only.
and presentation of factual material. May be repe in the collection, organization maximum credit in 198 and 199 limited to six units.

200A. Seminar in Advanced Economic Theory (3)
2008. Seminar in Advanced Economic Theory (3)

201A-201B. Seminar in the Development of Economic Thought (3-3)
202. Seminar in Comparative Economic Systems (3)
203. Economic Analysis (3)
206. The Public Economy (3)
208. Development Planning (3)
210. Seminar in Economic History (3)
231. Seminar in Public Finance (3)
235. Seminar in Monetary Economics (3)
238. Seminar in Urban and Regional Economics (3)
241. Seminar in Econometrics (3)
250. Seminar in Labor Economics (3)
253. Comparative Labor Seminar (3)
272. Seminar in Utilities and Water Resources (3)
274. Seminar in Economic Concentration and Monopoly Power (3)
290. Bibliography (1)
292. Seminar in International Economics (3)
295. Seminar in the Economics of Underdeveloped Countries (3)
297. Research (3)
298. Special Study (1-3)
299. Thesis (3)

Education
See "School of Education" in the catalog section Professional Schools: Courses and Curricula.

## Engineering

See "School of Engineering" in the catalog section Professional Schools: Courses and Curricula.

## English <br> In the College of Arts and Letters

Faculty
Emeritus: Adams Burnett, Dickhaut, Gulick, Johnson, F., Keeney, Kennedy
Marchand, Thenbald Marchand, Thenbald
Professors: Baker, J., Carrier, Dickinson, J., Frey, Gellens, Gross, Haskell, Leh
mann, Monteverde, Ollier Perkin mann, Monteverde, Ollier, Perkins, Phillips, , Sanderlin, Sandstrom, Shouse, Tid-
well, Tozer (Acting Chairman), Vanderbilt, Wanlos, Wid
Associate Professors (Acting Chairman), Vanderbilt, Wanlass, Widmer
Associate Professors: Benson, Hendrickson, Henig, Ingham, Keller, Rauber, Red-
ding, M., Santangelo, Seright, Taylor, H.
Assistant Professors: Aninger, Baylor, $H$.
G,, Donahue, Drake, Forrey, Gervais, Hinkle K, Butler, Chater, Crane, Davis, Kedding, R Roob, C., McLeod, Moramarco, Nelson, T., Nichols, P. S. Kepler, H., Rehang, R., Rogers, W. N., Rother, J., Sarfatt, Savvas, Stiehl, Sullivan, Taft,
Instructor: Fahy
Lecturers: DeMarinis, Farber

## Offered by the Department

Master of Arts in English.
Major in comparative literature with the A.B. in liberal arts and sciences.
Major in English with the A.B. in liberal arts and sciences.
Minor in comparative literature
Minor in English.
Teaching major in English, with specialization in both elementary and secondary
teaching.
Teaching
teaching.
teninor in English, with specialization in both elementary and secondary

## Comparative Literature Major

See "Interdisciplinary and Preprofessional Programs" in the catalog section
Degrees and Programs.

## English Major

## With the A.B. Degree in Liberal Arts and Sciences

Preparation for the major. English 6, $61 \mathrm{~A}-51 \mathrm{~B}$; six units selected from English
$52 \mathrm{~A}, 52 \mathrm{~B}, 53 \mathrm{~A}$, and 53 B ; and three units of elective or 1 Z . (18 units.)
Major. A minimum of 24 uper ision
proval of the adviser, to include (a) English 101 (b) at least nelected with the ap-
the areas of study the areas of study listed below and (c) at least (b) at least nine units in the apbefore 1800, three units in British Literature after 1800 anits in British Literature Literature. The same course may be used to satisfy requiremee units in American and (c). No more than six units of courses in Comparative Lited under both (b) Areas as part of the major in English. Areas of Study:
$3 \begin{gathered}\text { British Literature before } 1800 \text { : English 102, 103, 104, 111, 112, 113A, 113B, 121A, } \\ \text { 122A, } \\ \text {, } 122 \mathrm{~B} \text {, and Comparative Literature 120. }\end{gathered}$
3 British Literature after 1200 Literature 120 .
3 American Literature: English 130, 131, 133, 134, 1135, 116, 117, 118, and 121B.

## English

Modern Literature: English 116, 117, 118, 134, 135, and 136.
Literary Types, Theory, and Criticism: English 140, 142, 144, 150, 153, and Comparative Literature $124,125,126,150,152 \mathrm{~A}-152 \mathrm{~B}$, and $153 \mathrm{~A}-153 \mathrm{~B}$.
Creative Writing: English 170, 171, and 172.
English Linguistics: English 175, 180, 181, 182, 183, 184, and General Language 196.

NO1E: In addition to the courses listed above, appropriate sections of English major if approved by the departmental adviser.

## Selection of Courses

Prospective majors of sophomore standing may, with the consent of the course instructor and subject to general college regulations (see "Credit for Upper Division Courses" in the section of the catalog on General Regulations), substitute ix units of upper din proved by the departmental adviser
Students of junior or senior standing may substitute for any deficiencies in lower Students of jumionts in English (except English 6) an equivalent number of units of upper division courses selected with the approval of the departmental adviser.

## Comparative Literature Minor

The minor consists of 15 units in comparative literature, nine of which must be upper division.

## English Minor

The minor consists of 15 units in English, nine of which must be upper division.

## English Major

For the Standard Teaching Credential

## Specialization in Elementary Teaching

Preparation for the major. English 6, 51A-51B; six units selected from English $52 \mathrm{~A}, 52 \mathrm{~B}, 53 \mathrm{~A}$, and 53 B ; and three units of electives in English excluding $1 \mathrm{X}, 1 \mathrm{Y}$, $52 \mathrm{~A}, 52 \mathrm{~B}, 5 \mathrm{~A}$, , an
Teaching Major. A minimum of 24 upper division units in English selected with the approval of the adviser, to include (a) English 101; (b) at least one course from English 102, 103, 104, 111, 112, 113A, $113 \mathrm{~B}, 121 \mathrm{~A}, 122 \mathrm{~A}, 122 \mathrm{~B}$, and Comparafive Literature 155; (c) at least one course from English 114A, 114B, 115, 116, 117, 118, and 121B; (d) at least one course from English 130, 131, 133, 134, 135, and 136; (e) at least one course from English 175, 180, 181; (f) at least three courses (which may include courses taken under $b, c$, $d$, and $e$ above) in one of the seven areas of study listed above for the English Major with the A.B. degree in Liberal Arts and Sciences.
Education 133 is required in addition to the major.

## Specialization in Secondary Teaching

Preparation for the major. English 6, 51A-51B; six units selected from English $52 \mathrm{~A}, 52 \mathrm{~B}, 53 \mathrm{~A}$, and 53 B ; and three units of electives in English excluding 1X, 1Y, or 1 Z . ( 18 units.)
Teaching Major. (Undergraduate). A minimum of 24 upper division units in English selected with the approval of the adviser, to include (a) English 101; (b) at least one course from English 102, 103, 104, 111, 112, 113A, 113B, 121A, 122A, 122B, and Compartive Literature 155; (c) at least one course from English 114A, $114 \mathrm{~B}, 115,116,117,118$, and 121B; (d) at least one course from English 130, 131, 133,

134, 135, and 136; (e) at least one course from English 175, 180, 181; (f) at least three courses (which may include courses taken under b, c, d and e , f ) at least of the seven areas of study listed above for the English Major with the A.B.
degree in Liberal Arts and Sciences. In addition to Arts and Sciences.
In addition to the major, Education 122 and a second course selected from Engdential but not for the degree.

Postgraduate year. Six units of upper division or graduate courses in English.

## English Minor

## For the Standard Teaching Credential

The minor in English for elementary teaching consists of 20 units in English, ing consists of 21 units, to include: six units from English ish for secondary teach 53B, 54, and 65; and six units selected from English 175, 180 units in literature courses (English 101-173). Education 122 is also req; and nine

## Course Sequences

All year courses in comparative literature and in English may be taken in either semester, and either semester may be taken singly for credit. English 5 is pre-
requisite to all higher numbered English courses except 6 .

## Student Initiated Courses

Students may petition for a course which falls within the competency of th English Department but which is not among the regular course offerings for the present or following semester. Petition forms may be obtained from the Depart-
ment Secretary.

## Undergraduate Proseminars

Each semester, if adequate staffing permits, the Department may offer several of its courses as special, limited-enrollment proseminars. These proserer several tor) the opportunity as juniors and seniors who has the consent of the instricdiscussion groups.

## English for Foreign Students

Foreign students will be assigned to English 1X, 1Y, 1 Z or to English 5 or 6 on the basis of their performance on the English examination for foreign students tion requirements, but unit credit is granted for these coursellege general educa-

## R. Reading Laboratory (0) $\mathbf{I}$, 1

Andividual help with study for students wishing to improve reading ability or secure

## s. Spelling (0) $\mathbf{I}$, II

A semitutorial service for students wishing to improve their intensive review of principles and practice. Open to students at any level of col-
lege work.

## w. Writing Laboratory (0) $\mathbf{I}, \mathbf{I I}$

A semitutorial service for students wishing assistance in composition, either 1X. Fundamentals of Enila
A first course in English for Foreign or Bilingual Students (3) I, II
A first course in English grammar and composition with inteni dent to take English 1Y or, at the dy completion of this course dent to take English 1Y or, at the discretion of the instructor, English ifizs a stu-

1Y. English for Foreign or Bilingual Students (3) I, II
Prerequisite: English 1X.
English grammar and composition. Satisfactory completion of this course qualifies a student to take English $1 Z$ or, at the discretion of the insructor, English 5 or 6 .
12. English for Foreign or Bilingual Students (3) I, II

Prerequisite: English 1Y.
English grammar and composition. A continuation of English 1Y for students who need additional instruction and writing practice. Satisfactory completion of this course qualifies a student to take English 5 or 6.

## 5. Composition and Reading (3) I, II

Formerly English 3.
Practice in composition based on the study of outstanding expository writing in contemporary affairs, the sciences, and the arts. Not open to students with credit for Mexican-American Studies 2B.
6. Composition and Literature (3) $\mathbf{I}$, II

Formerly English 1.
Practice in composition, based on the study of representative works of imaginative literature. Introduction to one or more of the major literary genres: poetry drama, and fiction.

51A-51B. English Literature (3-3) I, II
English literature from the Anglo-Saxon period to the present, with emphasis on the major works in the literary tradition. Semester I: Ends with the neoclassical period. Semester II: Begins with the Romantic writers. (Formerly numbered English 56A-56B.)

## 52A-52B. World Literature (3-3) I, II

Major works from Homer to modern times. Semester I: Classical and medieval literature. Semester II: The Renaissance to modern times. Not open to students with credit in Comparative Literature 52A-52B

## 53A-53B. American Literature (3-3) I, II

Semester I: Major American writers from the beginning to 1860 . Semester II: Serican literature from 1860 to the present. (Formerly numbered English 50A 50B.)
54. Literary Theory and Criticism (3) I, II

Introduction to the various theories of literature and approaches to literary creation and criticism.
65. Language Study (3) II

Introduction to the principles and practice of modern linguistics as applied to the study of English.

## 70. Creative Writing (3) I,

Introduction to the theory and practice of writing in the major genres, with emphasis on basic concepts and tec
English 61, Sophomore Composition.)

## 71. Creative Writing: Selected Genres (3) I, I

Prerequisite: English 70.
Guidance and extensive practice in writing in one or more of the major genres: poetry, drama, fiction, or the essay. (Formerly numbered and entitled: English 62, Directed Writing.)
89. Studies in Literature (1-3) I, I:

Representative literary works of a major author, period, genre, theme, or the like. May be repeated with new content. Maximum credit six units. (Formerly numbered and entitled: English 10, Individual Reading.)
101. Shakespeare (3) I, II

An introduction to the writings of Shakespeare. (Formerly numbered English
$117 \mathrm{~A}-117 \mathrm{~B}$.)
102. Study of Shakespeare (3) II

Prerequisite: English 101.
Advanced study of Shakespeare's achievement as a poet and playwright 103. Chaucer (3) I, II

Chaucer's works, with emphasis on The Canterbury Tales and Troilus
Criseyde. (Formerly numbered English 151.) 104. Milton (3) II

Milton's writings, with emphasis on Paradise Lost. (Formerly numbered and en-
titled: English 120A titled: English 120A, The Seventeenth Century: Milton.)
105. The Bible as Literature (3) I, II

Same course as Comparative Literature 105.
Prose and poetry of the King James version. (Formerly numbered English 115.)
11. Renaissance Literature (3) I, It
English

English poetry and prose from 1485 to 1603. (Formerly numbered and entitled:
English 116 A , The Age of Elizabeth.)
112. Seventeenth Century Literature (3) II

English 120B, The Seventeenth Century: Mortry and prose formerly numbered and entitled 113A-113B. Restoration Century: Metaphysical and Cavalier Poets.)
English literature in the neo-clenth Century Literature (3-3) I, II their contemporaries. Semester II: Writers of the tury. (Formerly numbered English $118 \mathrm{~A}-118 \mathrm{~B}$.)
114A-114B. Nineteenth Century British Poetry (3-3) I, II
Semester I: The Romantic movement. Semester II, II
merly numbered and entitled, English. 119A, English Romantic Perian period. (For-
119 B, Victorian Poetry.)
115. Nineteenth Century British Prose (3) I, II

Nered-fictional prose of the Romantic and Victorian periods. (Formerly num 126B, Late Nineteenth Century British Prose.) and Victorian Prose; and English
116. Modern British Poetry (3) I, II

British poetry since 1900 .
117. Modern British Fiction (3) I, II

British fiction since 1900 .
118. Modern British Drama (3) I, II

British drama since 1890.
121A-121B. English Fiction (3-3) 1, II
The development of English fiction from its beginnings to the end of the ni
teenth century. Semester I T. The eighteent teenth century. Semester I: The eighteenth century. Semester II: The nine neterne-
century. (Formerly numbered and entitled. Englis. Novel.) (Formerly numbered and entitled: English 143A-143B, The English

## 122A-122B. English Drama (3-3) I, It

English dramatic literature from its beginnings to the nineteenth century. Semes re-opening of the theatres in 1660 .

## English

129. Topics in English Literature (3) I, II

The Works of Spenser, The Metaphysical School of Poetry, The English Satirists, and Major Movements in Contemporary English Fiction, and the like. May be rists, and Major Movements in Contemporary English
repeated with new content. Maximum credit six units.

## 130. Early American Literature (3) I

American Literature from its beginning to 1830.

## 131. The American Renaissance (3) I, II

Major American writers and their works in the period 1830-1865.
133. American Realism and Naturalism (3) I, II

American fiction from the Civil War to 1920.
134. Modern American Fiction (3) I, II

American fiction from 1920 to the present.
135. Modern American Poetry (3) I, II

American poetry from 1865 to the present.

## 136. American Drama (3) I, I

Dramatic literature by American writers from its beginnings to the present.
138. Topics in American Studies (3) I, II

American Folklore, The Literature of Social Protest, The Intellectual History of American Literature, and the like. May be repeated once with new content, and of American Literature, and the Studies majors with the approval of their advisers.
139. Topics in American Literature (3) I, II

Emerson and Thoreau, Black Writers in America, The Literature of the American South, The Frontier and American Literature, and the like. May be repeated with new content. Maximum credit six units.

## 140. Poetry (3) I, II

The study of poetry as a genre; theory and practical criticism. (Formerly numbered English 149.)
142. Fiction (3) I, II

The study of fiction as a genre; theory and practical criticism. (Formerly numbered English 148.)

## 144. Drama (3) I

The study of drama as a genre; theory and practical criticism.

## 149. Topics in the Study of Literary Genres (3) I, II

The study of particular aspects, techniques, or themes in one or more literary genres, such as Myth and Symbol in Poetry, The Nature of Tragedy, The Theate of the Absurd, The Hero in Fiction, Ideas and Forms in Modern Non-Fictiona Prose, and the like. May be repeated with new content. Maximum credit six units.
50. The H Princip. (Formerly numbered English 195A.)

## 153. Modern Criticism (3) I

The theory and practice of selected nineteenth and twentieth century critics, with emphasis on the distinctive feathres of the merly numbered and entitled: English 195B, Theory and Practice of Modern Criticism.)
170. The Writing of Poetry (3) I, II

Prerequisite: English 70.
A writing, workshop in poetry. May be repeated with new content. Maximum credit six units.

## Pre Writing of Fiction (3) I, II

Prerequisite: English 70.
Aredit sitix units.
172. The Writing of Non-Fiction (3)

Prerequisite: English 70,
A writing workshop in non-fictional prose. May be repeated with new content
Maximum credit six units.
175. Advanced Composition (3) I, II

The theory and practice of in
semantics, rhetoric, and logic. (Formerly numbered English 191) the contributions of
180. The English Language (3) I, It
192.)
181. The Structure of English (3) I, II

Tnalysis. (Formerly numbern English, including the various approaches to
182. American English (3) 1

The development of American English.
pronunciation, grammar, and vocabulary. (Formerly numbered Eural differences in 183. English Linguistics (3) II

180, or 181, or General Language 196.
Advanced study of Linguisic 196.
(Formerly numbered English 197.)
184. Phonemics and Morphemics (3)

The study of procedures for
ystems, the suing of sound units (both at the phonetic inventory of languace systems; the study of morphemic hierarchies and their dheir arrangements in forming
190. Selected Topics in English (2-3) I,

Specialized study of a selected topic in
with new content. Maximum credit six units.
194. Individual Reading (1) I, II

Selected works by a major aut
sediected works by a major author. May be repeated with new content. Maximum
cred 198. Comprehore

Prerequisite: Nive Reading and Survey (3) II
A study of major movements iner division work in English,
writers and key works. Individ in English literature the
student.
220. Indo-European (3)
223. Old English (3)
224. Middle English (3)
233. American Literature (3)
234. Literature of the Middle Ages (3)
235. Renaissance Literature (3)
236. Restoration and Eighteenth Century Literature (3)
237. Earlier Nineteenth Century Literature (3)
238. Later Nineteenth Century Literature (3)
239. Twentieth Century Literature (3)
243. Poetry (3)
244. Fiction (3)
245. Drama (3)
260. Workshop in Creative Writing (3)
290. Bibliography and Methods of Literary Research (3)
291. Seminar: A Major Author (3)
292. Seminar: A Cultural Period (3)
293. Seminar: A Literary Problem (3)
294. Seminar: A Literary Type (3)
295. Seminar in Linguistics (3)
298. Special Study (1-3)
299. Thesis (3)

## Comparative Literature

Since all reading assigned for classes in comparative literature is in English, knowledge of a foreign language is not required.

52A-52B. World Literature (3-3) I, II
Selected works from various continents and cultures. Semester I: prior to 1500; Semester II: since 1500.

70A-70B. Introduction to Oriental Literature (3-3)
Major writings in translation, with emphasis each semester on the literature of ne oriental country.
80A-80B. Third World Literature (3-3)
Modern literature from Third World cultures. Semester I: Literature from Africa, Asia, and Latin America. Semester II: Literature by ethnic minorities in the U.S.

102A-102B. Greek and Latin Literature (3-3)
Masterpieces of ancient Greek literature the first semester, Latin literature the second.
105. The Bible as Literature (3) I

Same course as English 105. Formerly Comparative Literature 115.
Prose and poetry of the King James version.
120. Medieval Literature (3)

Formerly Comparative Literature 155, Literature of the Middle Ages.
Representative selections from authors of the Middle Ages.
122. Continental Renaissance (3)

Formerly Comparative Literature 156.
Representative selections from authors of the Renaissance period in continental Europe.
124. Seventeenth and Eighteenth Century Continental Fiction (3)

Selected works by novelists and short story writers of continental Europe prior to 1800 .
25. Nineteen Century Continental Fiction (3)

Formerly Comparative Literature 101A, Modern Continental Fiction
tween 1800 and 1900 .
126. Modern Continental Fiction (3)

Formerly Comparative Literature 101B
1900.
138. Introduction to Aesthetic Appreciation (1)
(Same course as Humanities 138)
Major forms of expression and aesthetic experience in art, music and literater by an interdepartal presented by an interdepartmental staff through lectures, demonstric, and literature
discussions.

## 140A-140B. Masterpieces of French Literature (3)

A cultural course designed to be ivenure (3)
eenth, seventeenth Roland through Cyrano de Bergerac to the great French works to world thinking of Rabelais, nineteenth century authors. The asis on the sixMontesquieu, Voltaire, Rousseais, Montaigne, Molière, Racine. The contributions studied through lectures and outside realings, Flaubert, Maupassant, Zortes, Pascal,
42. The Golden Age of German It

Masterpieces of German Liferature (3) I, II
centuries.
Selected works in Masterpiecs German Literature (3) I, II
English
E.T.A. Hoffmenn, Heine, Keller, Hebs. Included are contrib writers, poets, and Mann, Kafka, Werfel, Benn, Brechebbel, Nietzsche, Hauptmann, Rilly Hölderlin
144. Masterpieces of Spanish

Reading selections from iterafure (3) I, II
.
Reading Latin American Literafure (3) I, II
.
150. The Epic (3)

Selected epic poems from world
tion from Homer to the present.

## 52A-152B. World Drama (3-3)

Selected tragedies and comedies from
limerature, with emphasis upon the human problems depicted thelish, and American cussions, and reports on readings.
153A-153B. World Poetry
Selected lyric Poetry (3-3)
second semester: 19th and 20th centuries.
Types of recedern Oriental Literature (3)
Types of recent literature in translation, (3)
oriental country. May be repeated once for additional credit the writing of one
180. Afro-American Literature (3)

Selected works by
Caribbean; intercontinental influences and the North and South America, and the
185. Yiddish Literature (3) I, II

Selected works from the Jewish communities of Central Europe
186. Modern Jewish Literature (3) I, II

Selected works by Jewish authors from the last half of the nineteenth century to the present, with emphasis on the United States and Israel.

## 190. Literary Movements (3).

A movement or theme in world literature-such as Symbolism, Realism, Existen tialism, alienation, or revolution. May be repeated for a maximum of six unit credit.

## 191. Literary Use of Legend (3)

Literary treatment of such legendary figures as Don Juan, Faust, and Ulysses, in a wide range of literature and genres.

## 192. Major Individual Authors (3)

In-depth study of the works of a major author, such as Sophocles, Dante, Cer vantes, Goethe, Dostoyevsky or Proust. Maximum credit six units.
193. Literature and Other Disciplines (3)

Comparative study of relationship between literature and another field, such as art, music, philosophy, psychology, political science, or social science. Examples peated with new content. Maximum credit six units.

## French and Italian

## Faculty

In the College of Arts and Letters
Emeritus: Brown, E. M.
Professors: Max, Messier, Piffard
Associate Professors: Glasgow, Nelson, H. (Chairman), Vergani, G.
Assistant
Palmer, Professors:
Lecturer: Marcuse

## Offered by the Departmen

Master of Arts degree in French
Major in French with the A.B. degree in liberal arts and sciences
Minor in French.
Minor in Italian.
Teaching major in French with specialization in both elementary and secondary
teaching.
teach
Teaching minor in French with specialization in both elementary and secondary
teaching.
Teaching
teaching.
teanor in Italian with specialization in both elementary and secondary

## French Major

With the A.B. Degree in Liberal Arts and Sciences
Students majoring in French must
proved by the departmental adviser in French. mended: History 4 A . B .
Major. A mini $101 \mathrm{~B}, 102 \mathrm{~A}-102 \mathrm{~B}$, and 12 units uper division units in French to include French 101A-

## French Minor

The minor consists of 15 units in French, six of which must be upper division

## Italian Minor

The minor consists of 15 units in Italian, six of which must be upper division

## French Major

## For the Standard Teaching Credentia

Preparation for the major. French 1, 2, 3, 4, 10, 11 (20 units)
1eaching maior. Twenty-four upper division units
takes in addition three upper 150 . The candidate for include French 101A-101B 136. The candidate for secondary tision units of electives in Frementary credential French in the period literature of teaching takes instead six French and Education in French in a postgraudate year. Proficiency
language, the candidate must pass an taking a student teaching assignmen by the department. In addition, the candidate fion in the language adminis the pass a written examination in French civilization. Ape secondary credential must department for time and place.

## French Minor

## For the Standard Teaching Credential

## Specialization in Elementary Teaching

The minor in French for elementary teaching consists of not less than 20 units in French, six units of which must be in upper division courses.
Proficiency Examivation. Before taking a student teach. language, the candidate for the credential must pass an oral examination in the language, the candidate for the credential must pass an oral examination in the must consult with the chairman of the Department of French and Italian for permission to take this examination.

## Specialization in Secondary Teaching

The minor in French for secondary teaching consists of not less than 20 units in French, exclusive of course equivalents, to include in the lower division, French 1 $2,3,4,10$, and 11 (or equivalents); and in the upper division, French 101A, 101B,
Proficiency Exam Proficiency Examinations: Before taking a student teaching assignment in the
language, the candidate for the credential must pass proficiency examinations, oral language, the candidate for the credential must pass proficiency examinations, oral and written, administered by the Department of French and Italian, in the language in the area civilization.) The candidate must consult with the chairman of the Department of French and Italian for permission to take these examinations.

## Italian Minor

For the Standard Teaching Credential

## Specialization in Elementary Teaching

The minor in Italian for elementary teaching consists of not less than 20 units in Italian, six units of which must be in upper division courses.
Proficiency Examination: Before taking a student teaching assignment in the language, the candidate for the credential must pass an oral examination in the language with the chairman of the Department of French and Italian for pate must consult this examination.

## Specialization in Secondary Teaching

The minor in Italian for secondary teaching consists of not less than 20 units in talian, exclusive of course equivalents, to include in the not less than 20 units in $2,3,4,10$, and 11 or equivalents; and in the upper division, Italian $101 \mathrm{~A}, 101 \mathrm{~B}, 102 \mathrm{~A}$,
Proficiency Examinations: Before taking a student teaching assignment in the language (Education 180C, 180D), the candidate for the credential must pass prociency examinations, oral and written, administered by the Department of French nd Italian, in the language and its area civilization. (Italian 40-41 or 140-141 preare corstande must consult the examinations.

## High School Equivalents

High school foreign language courses may be used for purposes of placement in college courses and may be counted toward meeting the foreign language requirement in various majors. These high school courses will not count as college credit ward graduation.

The first two years of high school French may be counted as the equivalent of French 1; three years the equivalent of French 2; and four years the equivalent of French 3 . The last year-course taken by a student in the high school language sequence may be repeated in college for graduation credit, not to exceed four units of repeated foreign language work. These same regulations apply to Italian.

## French

All upper division courses in French are taught in French unless otherwise noted.

1. Elementary (4) I, II

Four lectures and one hour of laboratory.
Pronunciation, oral practice, readings on French culture and civilization, mini-
num essentials of grammar.
2. Elementary (4) I, II

Four lectures and one hour of laboratory.
Prerequisite: French 1 or two years of high school French
Continuation of French 1.
3. Intermediate (4) $\mathbf{1}, \mathbf{I I}$

Prerequisite: French 2 or three years of high school French.
A practical application of the fundamental principles of grammar. Reading in
rench of cultural material, short stories, novels or plays; oral practice.
4. Intermediate (4) I, II

Prerequisite: French 3 or four years of high school French
Continuation of French 3; outside reading with oral and written reports.
7A-7B. Intensive Reading Course in French (2-2)
Prerequisites: French 1 and 2 or three years of high school French. French 7A
prerequisite to French 7B. is prerequisite to French 7B.
Intensive reading of material from the hum for the purpose of developing reading skills in French. Ond social sciences selected aring for departmental reading examinations. Not open to students students pre-

8A-8B. Scientific Reading (2-2)
Prerequisites: French 2 with a grade of C or better, or three years of high school
French. French 8A is prerequisite to French 8B eadings 8A is prerequisite to French 8B.
etc. Outside reading of books and periodicals, physics, medicine, zoology, biology, students with credit in French 3 or 7A-7B.

## 10. Conversation (2) $\mathbf{1}, \mathbf{I I}$

Prerequisite: French 2 or three years of high school French.
Practice in the spoken language; practical vocabulary, conversation on

## 11. Conversation (2) I, II

Prerequisite: French 10 or French 3, or four years of high school French
Continuation of French 10.
101A-101B. Advanced Oral and Written Composition (3-3)
Prerequisites: French 4 and 11.
Translation into French from moderately difficult English prose. Outside reading oral discussions in Frose, with written reports in French monthly. Readings ang 02a
02A-102B. Survey Course in French Literature (3-3)
Prerequisite: French 4.
Important movements, authors, and works in French literature from the Middle Ages to the present. French 10 and 11 strongly recommended for from the Middle
150. Advanced Phonetics and Diction (3) Irregular

Prerequisites: French 1, 2, 3, 4, or equivalents, 10 and 11.
Fiction. Correct formation of French wishing to perfect their pronunciation and exercises, individual drill, and use of special discs and tape recording

## 201. History of the French Language (3)

202. Medieval French Literature (3)
203. Literature of the French Renaissance (3)
204. The Novel in France in the 20th Century (3)
205. The Theater in France in the 20th Century (3)
206. Explication de Textes (3)
207. Methods of Literary Criticism (3)
208. Seminar in Seventeenth-Century Literature (3)
209. Seminar in Eighteenth-Century Literature (3)
210. Seminar in Nineteenth-Century Literature (3)
211. Research and Bibliography (3)
212. Comprehensive Reading and Survey Course (3)
213. Special Study (1-3)
214. Thesis (3)

## Italian

1. Elementary (4)

Four lectures and one hour of laboratory.
Pronunciation, oral practice, readings on Italian culture and civilization, minimum
essentials of grammar.
2. Elementary (4) II

Four lectures and one hour of laboratory.
Prerequisite: Italian 1.
Continuation of Italian 1.
3. Intermediate (4) I

Prerequisite: Italian 2.
A practical application of the fundamental principles of grammar. Reading in Italian of cultural material, short stories, novels or plays; oral practice; outside
reading with oral and written reports.
4. Intermediate (4) II

Prerequisite: Italian 3
Continuation of Italian 3. Reading of selections from Italian literature.
10. Conversation (2) I

Prerequisite: Italian 2 or three years of high school Italian.
Practice in the spoken language; practical vocabulary, topics; simple dialogues and plays.

## 11. Conversation (2) II

Prerequisite: Italian 10 or Italian 3, or four years of high school Italian
40. Italian Civilization (3) I
(Same course as Humanities 54)
Conducted in English.
The major aspects of Italian civilization with particular emphasis upon literature, art, philosophy, music, and history.

## 41. Italian Civilization (3) II

(Same course as Humanities 55)
Conducted in English.
Continuation of Italian 40
101A-101B. Advanced Oral and Written Composition (3-3)
Prerequisite: Italian 4 and 11, with a grade of C or better
Translation into Italian from moderately difficult English prose. Outside reading of modern Italian prose, with monthly written reports in Italian. Readings and oral discussions in Italian on various facets of Italian life and culture.
102A-102B. Survey of Italian Literature (3-3)
Prerequisite: Italian 4 with a grade of C or better.
Important movements, authors, and works in Italian literature from the Middle Ages to the present.

103A-103B. Dante and the Divine Comedy (3-3)
Prerequisites: Italian 101A-101B, 102A-102B.
The poet, his cultural background, and his political-historical mission.
104A-104B. Literature of the Italian Renaissance (3-3)
Prerequisites: Italian 101A, 101B, 102A, 102B.
Literature of the 15 th and 16 th centuries as presented in the works of Poliziano Lorenzo de' Medici, Pulci and Boiardo; Machiavelli, Aristo, Michelangelo, Cellini
122. The Foreign Language Laboratory (2)

Conducted in English
Prerequisite: Admission to teacher education.
Utilization of the language laboratory, applied to the teaching of foreign languages, including operation of equipment and preparation of material. Discussion French, German, Spanish, or Russian 12 . Not open to students with credit in
140. Italian Civilization (3) I
(Same course as Humanities 154)
Conducted in English.
An advanced course in the major aspects of Italian civilization with particular mphasis on literature, art, philosophy, music, and history with written reports on ndividual topics.
141. Italian Civilization (3) II
(Same course as Humanities 155)
Conducted in English.
Continuation of Italian 140

## 50. Advanced Phonetics and Diction (3)

Prerequisites: Italian 4, 10, and 11.
For students and teachers of Italian wishing to perfect their pronunciation and iction. Correct formation of Italian sounds in isolation and combination. Class exercises, individual drill, and use of special discs and tape recordings.

## General Language

An Interdisciplinary Program Administered by the Dean of the College of Arts and Letters
20. Latin and Greek Word Derivation (3) I, II
of moseral and elementary course in philology. A study of Latin and Greek stems them.
196. General Linguistics (3) I

Open only to seniors and graduate students. Recommended: Reading knowledge
of Latin, French, Spanish, or German. The Frich, Spanish, or German.
Romanic, and Germanic language groups.

## Geography <br> In the College of Arts and Letters

## Faculty

Emeritus: Molitor, Post, Storm
Professors: Eidemiller, Finch, Pouquet, Richardson, R., Taylor, J., Yahr
Associate Professors: Blick, Greenwood, Heiges, Keen, Kiewiet de Jonge, O'Brien
Assistant Professors: Colombo, Ford, L., Johnson, W.A., Pryde, Quastler, Stutz,

## Offered by the Department

Master of Arts degree in geography.
Major in geography with the A.B. degree in liberal arts and sciences.
Minor in geography.
Teaching major in geography with specialization in secondary teaching
Teaching minor in geography with specialization in both elementary and secondary teaching.

## Major

With the A.B. Degree in Liberal Arts and Sciences
Students majoring in geography must complete a minor in another field to be approved by the major adviser.
Preparation for the major. Geography 1 and 2 ( 6 units). Four to six units elected from Geography 3,4,5,7,54, and 60 are strongly recommended
Major. A minimum of 24 upper division units in geography to include three units rom courses numbered 100-109, three units from courses numbered 110-111 and units from courses numbered $119-139$, three units from 180 rom 181A or 183, three units from 198 taken from three different instructors, and hree units of electives.

## Minor

The minor consists of 15 units in geography, nine of which must be upper

## Major

For the Standard Teaching Credential

## Specialization in Secondary Teaching

 Preparation for the major. Geography 1 and 2 ( 6 units). Four to six unitsselected from Geography 3, 4,5, Teaching major. A minimum of 24 upper division units in geography to include nine units in courses numbered $100-111$ and $150-179$, six units in courses numbered 119-139, six units in courses numbered 180-189, and three units of electives.
Postgraduate Year. Six upper division or graduate units acceptable toward the credential, to be selected with the help of the departmental adviser.

## Minor

For the Standard Teaching Credential
The minor in geography for the standard teaching credential with specialization in either elementary or secondary teaching consists of not less than 20 units in geography to include Geography 1 and 2, and a minimum of 9 units of upper

1. Introduction to Geography: Physical Elements (3) I

The nature of maps, weather and climates of $\mathbf{I}, 1$
forms and their associated soils, with reference to wheir the natural vegetation; land eas and their coasts. Related field observations. to their climatic relationships; the
2. Introduction to Geography: Cultural

The regional differentiation of
omy and nationality. A maximum of six units will be allowed fireal bases of econ112A or 112B.
3. Introduction to Mefeorology (3) I, II

The composition, structure, and circulation of the
tary theory of storms and other weather disturbances. May be, including elemen-
taken with, Geography 4 . taken with, Geography 4.
4. Introduction to Meteorology Laboratory (1) I, II

Three hours of laboratory.
Prerequisite: Credit or concurrent registration in Geography 3
Theory of meteorological instruments
surface and upper air observations, weather codes, and elementactical exercise in
analysis.
5. Physical Geography Laboratory (1)

Three hours of laboratory.
Practical exercise and observatit registration in Geography 1
regions,
atures. Designed to supppelements, climatic
Man and the Environmental Problem (3)
Man's impact upon and interact (3)
gested alternatives to existing abuses. Not open to students with, including sug-
raphy 170 . raphy 170.

## 54. Urban Geography (3)

Prerequisite: Geography 1 or 2
cities, urbanization, and urban in urban geography, the origin and development raphy 154.

## 60. Economic Geography (3) I,

Prerequisite: Geography 1 or 2 production, extractive industries, manufacturing regions, indiples of agricultural

## 00A. Physical Climatology (3)

Prerequisite: Geography 3.
Effects of latitude, altitude
surfaces on the distribution of solar radiation, temperature, wind systems, and various
climatic elements. Statistical 00.

Oob. Regional Climatology (3)
Prerequisite: Geography 3.
several climatic classifications.
101. Climatic Physiography (3)

Prerequisites: Geography 1, Geology 1A or 2 .
The origin and morphology of landforms with emphasis on the external forces
102. Structural Physiography (3)

Prerequisites: Geography 1, and Geology 1A or 2.
Origin and morphology of landforms with emphasis on internal forces.

## 103. Fluvial and Eolian Physiography (3)

Prerequisites: Geography 1, Geology 1A or 2.
Flowing water and the wind as agents in shaping the land. Transportation of material by water and air, drainage basin characteristics, river channel shape and dimension, sand dunes, and loess.

## 104. Coastal and Submarine Physiography (3)

Prerequisites: Geography 1, Geology 1A or 2.
Marine physiographic processes and their effects on developing the landforms of coasts, continental shelves, and ocean floors.

## Seography of Soils (3)

The nature, properties and distribution of soils and their relationships to the influence of climates, landforms, and human activity

## 06. Geography of Soils Laboratory (1)

Three hours of laboratory.
Prerequisite: Credit or concurrent registration in Geography 105.
Theories of soil genesis, edaphology and structure related to empirical phenomena through laboratory experimentation and observation. Best suited to concurrent enrollment in Geography 105.

## 07. Geography of Natural Vegetation (3)

Prerequisite: Geography 1.
The natural vegetation associations of the world their distribution, classification and development, including relationship to human activities

## 10. Historical Geography (3) II

Prerequisite: Geography 1 or 2.
Transformation of the natural and cultural landscape with emphasis on the utilization and significance of resources. Exploration, migration, and settlement in relation to geographic phenomena.

## 11. Principles of Geographical Analysis (3

Prerequisites: Geography 1 and 2.
Major concepts and techniques of the field of geography.

## 112A-112B. Culture Worlds (3-3)

The evolution, distinguishing cultural characteristics, and physical features of the major cultural regions of the world, with emphasis on the role man has played in the alteration of the natural landscape. A maximum of six units will be allowed or Geography 2, and

## 19. Geography of San Diego County (3) It

Saturday field trips to be arranged.
Prerequisites: Geography 1 and 2.
Analysis of the physical and cultural geographic aspects of San Diego County. Comple (Formerly course. (Formerly numbered Geography 184.

## 120. California (3) I, II

Prerequisite: Geography 1 or 2.
Systematic and regional analysis of the topography, climate, natural vegetation, and their relationships with the past and present activities of man and his use of the land; field trip. Offered in summer with a 10 -day tour.
121. United States (3) I, II

Prerequisite: Geography 1 or 2.
The natural regions of the United States, their formation and economic and historical development.
122. Canada and Alaska (3) II

Prerequisite: Geography 1 or 2.
The physical and historical bases of Canadian and Alaskan regionalism; the economic and strategic importance of these two areas.

## 123. Middle America (3) II

Prerequisite: Geography 1 or 2.
The land and peoples of Mexico, Central America, and the islands of the Caribbean; a survey of the resources, economies, and trade of the region.

## 124. South America (3) :

Prerequisite: Geography 1 or 2.
The physical regions and human geography of South America, including the history of colonization and the exploitation of resources.

## 125. North Africa and the Near East (3)

Prerequisite: Geography 1 or 2.
The geographic bases for the political heritage, economies and peoples of North Africa, including the Sahara, and the Near East.

## 126. Europe (3) I, II

Prerequisite: Geography 1 or 2.
Systematic analysis of the geographic bases of modern European life. Regional investigation of countries of Europe except the Soviet Union.

## 127 Soviet Union (3) I, II

Prerequisite: Geography 1 or 2.
Natural resources, agricultural production, industrial growth, and transportation.
129. Oceania (3) II

Prerequisite: Geography 1 or 2.
The physical geography, peoples, economies, and trade of Oceania, Australia, and New Zealand

## 130. Central and Southern Africa (3) I

Prerequisite: Geography 1 or 2.
A regional geography of Africa south of the Sahara; the physical geographic base for the peoples and their economic activities.

## 131. Eastern Asia (3) I

Prerequisite: Geography 1 or 2
The geographic bases for the political heritage, economies, and people of Eastern

## 133. Southeastern Asia (3)

Prerequisite: Geography 1 or 2.
The geographic bases for the political heritage, economies, and peoples of Southeastern Asia.

## 134. Southern Asia (3)

Prerequisite: Geography 1 or 2.
The geographic bases for the political heritage, economies, and peoples of Southern Asia.
150. Political Geography (3) I

Geography as it relates to the strength of nations and international relations.
151. Economic Geography: Primary Production (3) I

Prerequisite: Geography 1 or 2.
The geography of agricultural production and the extractive industries in relation to world commerce.

## 152. Industrial Geography (3) II

Prerequisite: Geography 1 or 2.
Principles of industrial location, with emphasis on the distribution of the world's major manufacturing regions,

## 153. Location Analysis and Geographic Theory (3)

Prerequisite: Geography 111.
Spatial arrangement and interrelationships of resources, production, exchange and consumption of goods and services and a study of location theory in economic geography.
154. Geography of Cities (3)

Prerequisite: Geography 2.
Survey of the location, function and spread of cities; the spatial and functional arrangement of activities in cities, leading to an analysis of current urban problems: sprawl, city decline, metropolitan transportation. Not open to students with credit in Geography 54.

## 155. Urban Location and Settlement Geography (3)

Prerequisite: Geography 54 or 154.
Analysis of urban and other agglomerated settlements in terms of their spatial arrangement, principal functions, economic base, and supporting areas.

## 56. internal Spatial Structure of Cities (3)

Prerequisite: Geography 54 or 154
Geographic principles and characteristics concerning the internal structure and unctioning of urban centers, including discussions of internal problems of our cities today. Field reconnaissance in the local urban "laboratory".

## 157. Quantitative Methods of Urban Analysis (3)

Prerequisite: Geography 155 or 156 and 185.
Spatial models of urban activities and land use, population distribution and allocation, and computer applications in urban analysis, including computer methods of mapping and graphing.

## 158. Transportation Geography (3)

Prerequisite: Geography 1 or 2
The spatial distribution of transportation networks and commodity movement and their relationship to the distribution of economic activity.
159. Urban Transportation Geography (3)

Prerequisite: Geography 54,154 , or 158
Urban transportation networks and their effects, past, present, and future on the economy and physical structure of the urban region.

## 160. Advanced Transportation Geography (3)

Prerequisite: Geography 158 or 159.
Topics in the spatial analysis of transportation, e.g., spatial interaction patterns, diffusion process, models in spatial analysis.
170. Conservation of Environmental Quality (3)

Prerequisite: Geography 1 or 2.
Quality of man's habitat in a changing human and natural environment; water, air and soil pollution, urban crowding, disappearance of open space, and decreasing opportunities for outdoor recreation. Not open to students with credit in Geograoppor
phy 7.
171. Conservation of Natural Resources (3) I, II

Prerequisite: Geography 1 or 2
Nature and extent of mineral, soil, water, forest, and wildlife resources and their conservation, with particular emphasis on the United States against a general back round of world resources. Conservation philosophies and practices and thei geographic bases.
173. Geography as Human Ecology (3)

Prerequisite: Geography 7 or 170.
Human ecology related to resource geography.
174. Water Resources (3) II

Prerequisite: Geography 1 or 2 ; and 7,170 , or 171
Occurrence and utilization of water resources and the problems of water resource development.
175. Geography of Recreational Land Use (3)

Prerequisite: Geography 7, 170 or 171
Importance of location and environment in the use, management, and quality of recreation areas.

## 176. Geography of Marine Resources (3)

Prerequisites: Geography 1 or 2.
Economic geography of use of marine biotic and mineral resources.

## 180. Field Geography (3)

Prerequisites: Senior or graduate standing and the completion of at least 12 units in geography, including Geography 1 and 2 , and consent of instructor.
Directed fieldwork in physical and cultural geography.

## 181A. Maps and Graphic Methods (3)

Two lectures and three hours of laboratory,
Prerequisite: Geography 1 or 2
The art and science of creating graphs and maps as media for describing and graphic techniques with emphasis on poratory instruction and practice in carto
1818. Advanced Cartography (3)

Two lectures and three hours of laboratory.
Prerequisite: Geography 181A.
Advanced laboratory instruction and practice in cartographic techniques.
181C. Automated Cartography (3)
Two lectures and three hours of laboratory.
Prerequisite: Geography 180, 181A, 182, 183, 185, or 187.
Computerized methods in presenting for comprehension spatially variable infor mation of a quantitative nature; examination of existing automated mapping sys-
182. Use and Interpretation of Aerial Photographs (3) II

Two lectures and three hours of laboratory.
Prerequisites: Geography 1 and consent of instructor.
Stereoscopic interpretation and cartographic representation of landforms, vegeta-
tion, and land use. Emphasis on practical exercises. tion, and land use. Emphasis on practical exercises.

## 183. Map Investigation (3) I

Two lectures and three hours of laboratory
Prerequisite: Geography 1 or 2
Interpretation and evaluation of maps. History of developments in cartography Study of major mapping organizations of the world and examination inaphy. products.
280. Techniques of Field Research (3)
281. Seminar in Cartography (3)
285. Seminar in the Use of Quantitative Methods (3)
288. Seminar in Remote Sensing of the Environment (3)
296. Geographic Internship (3)
298. Special Study (1-3)
299. Thesis (3)

## Geology

## In the College of Sciences

## Faculty

Emeritus: Brooks
Professors: Allison, Bassett, Gastil (Chairman), Peterson, G., Roberts, Thomas, B., Threet

Associate Professors: Berry, Krummenacher, Libby, McEuen, Ptacek
Assistant Professors: Frederiksen, Kern
Lecturers: Phillips, Thiesmeyer

## Offered by the Department

Master of Science degree in geology.
Major in geology with the B.S. degree in applied arts and sciences. Minor in geology.

## Major

With the B.S. Degree in Applied Arts and Sciences
The major consists of basic requirements in the lower and upper division for all students plus the requirements in one of the following options: (a) General Gestudents plus the requirements in one of the following options:
ology, (b) Paleontology, (c) Geophysics, and (d) Geochemistry.

## Basic Requirements for All Students

Preparation for the major. Geology 2 and 3, or 4; 5, 21, 24; Chemistry 1A-1B; and Biology 1 and 2 ( 32 units). Recommended: a foreign language and a course and Biology 1 and 2 ( 32 units). Recommended: a foreig
mechanical wrot in Major. Thirty-six upper division units in approved courses to include Geology $100,108 \mathrm{~A}-108 \mathrm{~B}, 198 \mathrm{~A}-198 \mathrm{~B}$ ( 14 units). Other courses may be substituted for 108B and 198A-198B in the Geophysics option.

## Options

In addition to the basic requirements, the student must complete the requirements in one of the following options:

## (a) General Geology

Additional preparation for the major. Mathematics 12 and 50 ; Physics 4A, 4B, 4C (20 units). Recommended: Mathematics 7, 51, and 52; Chemistry 109 or 110 .

Major (continued). Geology 30 and 106; 126, or 124 and $125 ; 130$, and at least one of the following: Geology 105, 107, 120, 121, 125, 140, 150, or 160 . Electives approved by the departmental adviser to complete 36 upper division units. Recommended: Engineering 2, Chemistry 109 or 110.
(b) Paleontology

Additional preparation for the major. Biology 15; Mathematics 50, or 21 and 22 (alternative of 21 and 22 should not be selected by students planning and 22 (alternative of 21 and 22 should not be selected by students planning academic ( $16-21$ units). Recommended: Zoology 50.
Major (continued). Geology 106, 107, 116, and 126. Two courses chosen from the following list: Biology 110; Botany 100 or 172 ; Zoology 106, 112, 155, or 160. Addiional biology and other electives approved by the departmental adviser to complete 36 upper division units.

## (c) Geophysics

Additional preparation for the major. Mathematics 7,50,51, and 52; and Physics 4A-4B-4C, 73. Recommended: Engineering 30 ( 30 units).
Major (continued). Geology 110, 112, 120, 121, 130, Mathematics 119, Physics 110 120A. Either Mathematics 170 and Physics 156, or Physics 100A and 114. Recom mended: Engineering 128A.

## (d) Geochemistry

Additional preparation for the major. Chemistry 5, and 11 or 12; Physics 4A-B-4C; Mathematics 50,51 , and 52 ( 33 units). Recommended: Mathematics 7
Major (continued). Geology 131; Chemistry 110A-110B. Either Geology 106 and 126, or Geology 124 and 125. Electives approved by the departmental adviser to complete 36 upper division units. Recommended: Geology 130.

## Marine Geology

An option in marine geology is not offered. Interested persons should study marine geophysics, marine geochemistry, paleontology, engineering geology, or general geology.

## Minor

The minor in geology consists of 15 units in geology, six of which must be in upper division courses.
All minors should include Geology 2 and 3 , or 4 , and 5 ( 8 units). Preparation for teaching or naturalist work should include at least two of the following:
Geology 14, 21 , or 24 ( $7-8$ units), and at least two of the following: Geology 100 , $102,106,108 \mathrm{~A}, 126$, or 140 . Those interested in environmental studies seology 100 at least two of the following: Geology 14, 21, 24, 30 ( $7-8$ units), and at tak two from: Geology 100, 105, 130, 140, 150. Those interested in oceanography should take at least two from: Geology 14, 21, 24, 30, and at least two from 106 116, 126, 130.

## 2. General Geology (3) I, II

Earth materials and processes, the development of land forms, and a brief con sideration of the history of the earth. Open to all students except those with previous credit in geology.
3. General Geology Laboratory (1) $\mathbf{I}$, II

Three hours of laboratory.
Prerequisite: Credit or concurrent registration in Geology 2
Recognition of common earth features and materials with experience in both field and map relationships. Designed to accompany and augment Geology 2. Not open to students with previous laboratory credit in geology.

## 4. Physical (4) I, II

Formerly Geology 1A.
Three lectures and three hours of laboratory with related field study during the semester.
Prerequisite: high school chemistry or physics, or credit or concurrent registraion in college chemistry or physics.
The composition, origin, and distribution of earth materials, and their modification through mechanical and chemical processes. Not open to students with credi for Geology 2.
5. Misforical (4) I, II

Formerly Geology 1B.
Three lectures and three hours of laboratory. Arrangement for field study during the semester.
Prerequisite: Geology 2 and 3, or 4
Theories of earth origin, and the evolutionary history of the earth as traced through rock and fossil records. Consideration of the Paleontologic Sequence.
14. Geomorphology (3) II

Prerequisite: Geology 5.
Development and classification of land forms with consideration of processes involved.
21. Mineralogy (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: credit or concurrent registration in Geology 2 and 3, or 4; high school chemistry and trigonometry, or credit or concurrent registration in college chemistry and trigonometry.
Practice in the determination of the common minerals; their geologic environment, utilization and economic significance.

## 24. Petrology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Geology 2 and 3, or 4, and credit or concurrent registration in Geology 21.

The origin, occurrence, identification, and classification of rocks in hand specimen and thin section. Introduction to the use of the petrographic microscope.
30. Introduction to Geophysics (3) II

Prerequisites: Geology 2 and 3, or 4; elementary algebra and plane geometry.
Physics of the earth and its application to mineral exploration. Emphasis on case histories. Not open to students with credit in Geology 110 or 112.

## 53. General Geology for Engineers (1) i,

One three-hour laboratory or field project per week.
Prerequisite: Engineering 2 or 24.
Earth materials, geologic processes, and methods of geologic interpretation of particular concern to the engineer. Open only to students majoring in engineering. Not open to students with credit in Geology 3.

## 100. Structural Geology (3) I, II

Two lectures and three hours of laboratory per week with occasional field trips
Prerequisites: Geology 1A, 1B and trigonometry.
Structural features of the earth, both deformational and primary. Mechanical principles, causes of folding and faulting, graphic solutions and analyses.

## 102. Geology of North America (3) I

Prerequisite: Geology 1B
A regional analysis of North American geology, its structural, stratigraphic, and A regional and

## 105. Photogeology (3) II

Two lectures and three hours of laboratory
Prerequisites: Geology 14 and 100.
Geologic interpretation of aerial photographs, elementary stereoscopy and stereometry applied to structural and stratigraphic problems, and compilation of geologic ometry applied to structural and stratigraphi.

## 106. Paleontology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Geology 1B and Biology 1 and 2.
Principles and methods, exemplified by a study of the morphology, classification, habit, and geologic significance of fossil invertebrates.
107. Stratigraphy (3) II

Two lectures and three hours of laboratory.
Prerequisites: Geology 5 and 24.
Stratigraphic principles and practices. Consideration of the North American stratigraphic record.

108A. Field Geology (4) II
One lecture and three hours of laboratory, and twelve Saturday field sessions in the local area.
Prerequisites: Geology 100 and credit or concurrent registration in Geology 24. Techniques and methods of geologic observation, interpretation, and field mapping.

## 1088. Field Geology (4) I

Prerequisite: Geology 108A.
Geologic investigation of an assigned area with preparation of an individua
110. Petroleum Geophysics (3)

Formerly Introduction to Geophysics.
Prerequisites: Geology 100, Mathematics 52, Physics 4A-4B-4C.
Airborne, surface, and bore-hole geophysical techniques as presently used in

## 112. Mining Geophysics (3) II

Formerly Advanced Geophysics
Two lectures, and three hours of laboratory or occasional field trips.
Prerequisites: Geology 100, Mathematics 52, Physics 4A-4B-4C
Airborne, surface, and bore-hole geophysical techniques used for delineation
of ore bodies.

## 116. Micropaleontology (3) II

One lecture and six hours of laboratory.
Prerequisite: Geology 106
The morphology, classification and geologic significance of the various microfossils.

## 118-5. Summer Field Problems (4-6)

Prerequisite: Geology 108A and consent of instructor
Field techniques in the investigation of selected geological problems. This course
cannot be substituted for Geology 108B.

## 19-S. Summer Field Tour (2)

Prerequisite: Consent of instructor.
A two-week study of some of the classic geologic localities in the western United States. A camping trip with travel by chartered bus. Localities visited may vary

## 120. Ore Deposits (3) I

Prerequisites: Completion or concurrent registration in Geology 24 and 100. Geologic relations, origin, distribution, and economics of metallic and non-

## 121. Petroleum Geology (3) II

Prerequisites: Completion or concurrent registration in Geology 24 and 100 Geologic occurrence of petroleum and the application of geologic principles in
exploration and production.

## Geology

124. Optical Mineralogy (3) I

Two lectures and three hours of laboratory.
Prerequisite: Geology 21.
Theory and use of the polarizing microscope for determining optical properties of minerals as an aid to their identification.

## 125. Petrography (4) II

Two lectures and six hours of laboratory.
Prerequisites: Geology 124 and 130
A study of rocks with the polarizing microscope; identification of mineral conA study of rocks with the polarizing microscope; identification of mineral con-
stituents; interpretation of textures; classification of rocks; problems of genesis.

## 126. Sedimentology (3) II

Two lectures and three hours of laboratory.
Prerequisites: Geology 5 and 24.
Origin, description, and classification of sedimentary rocks and structures.

## 130. Geochemistry (3) I, II

Two lectures and three hours of laboratory
Prerequisites: Geology 24 and Chemistry 1B; Mathematics 21 and 22, or 50
The relationship of basic chemical principles to geologic phenomena and environThe relationship of basic chemical principles to geologic pheno
131. Advanced Geochemistry (3)

Prerequisites: Geology 24 and credit or concurrent registration in Chemistry 10B.
Application of physical-chemical methods and principles to the solution of geologic problems. Emphasis on major earth cycles and processes.

## 140. Marine Geology (3)

Two lectures and three hours of discussion, demonstration, and field work Prerequisites: Geology 5, and either Geology 14, 24, 102, or 106.
The morphology, composition, structure, history, and geologic processes of the earth beneath the sea.
150. Engineering Geology (3) I

Two lectures and several weekend field trips.
Prerequisite: Geology 108A.
Case histories selected to demonstrate the application of geology to the location, design, and maintenance of engineering projects.

## 160. X-Ray Diffraction (2) II

One lecture and three hours of laboratory.
Prerequisites: Chemistry 1A-1B; Mathematics 50 ; Physics 2A-2B and 3A-3B
or $4 \mathrm{~A}-4 \mathrm{~B}-4 \mathrm{C}$; and credit or concurrent registration in either Chemistry 109A or 110A, Engineering 25, Geology 21, or Physics 101.
Theory and application of X-ray diffraction to the study of materials.

## 173. Stratigraphic Palynology (3) II

Formerly Geology 221, Advanced Palynology
One lecture and six hours of laboratory.
Prerequisite: Botany 172.
Recovery and study of spores, pollen grains, and microplankton from ancient
and modern sediments; stratigraphic, ecological, and botanical significance of these microfossils.

## 96. Advanced Topics in Geology (1-3) I, II

Prerequisite: consent of instructor
Selected topics in geology and related earth sciences. May be repeated with new content for maximum credit of six units.

198A. Senior Research (1) I, II
Prerequisite: Credit or concurrent registration in Geology 108A.
Three hours of laboratory and discussions.
Selection and design of an individual research project. Oral and written progress
reports. reports.

198B. Senior Research (2) I, II
Six hours of laboratory and discussions.
Prerequisites: Geology 198A and Geology 108B.
Individual research project, involving field work in a selected field of geology, work accomplished.
200. Seminar (1-3)
208. Graduate Field Geology (3) II
209. Igneous Petrology (3)
211. Metamorphic Petrology (3)
212. Sedimentary Petrology (3)
220. Biostrafigraphy (3)
225. Paleoecology (3)
229. Seminart Advanced Studies in Strafigraphy (3)
235. Marine Processes (3)
240. Geotectonics (3)
245. Advanced Structural Geology (3)
250. Seminar: Physical Properties of Earth Materials (3)
260. Isotope Geology (3)
270. Pleistocene Geology (3)
280. Sedimentary Geochemistry (3)
285. Genesis of Ore Deposits (3)
297. Research (1-3)
298. Special Study (1-3)
299. Thesis (3)

## Specialization in Secondary Teaching

Preparation for the major. German 1, 2, 3, 4 (or equivalents), 10, and 11. (20 units.)
Teaching Major (Undergraduate). A minimum of 24 upper division units in German to include German 101A-101B, 102A-102B, 140, 141, and six upper division units of electives in German. In addition to the major, credential candidates must complete Education 136. Recommended: German 148, 150; and 125A or 125B.
Postgraduate Year. Six units of graduate courses in German.

## German Minor

The minor consists of 15 units in German, six of which must be upper division. For elementary teaching, it consists of 20 units in German, six of which must be upper division.
For secondary teaching, it consists of German $1,2,3,4,10,11,101 \mathrm{~A}-101 \mathrm{~B}$, $102 \mathrm{~A}-102 \mathrm{~B}$, and 125 A or 125 B .

Proficiency examination. As above, for the major.

## Russian Major

With the A.B. in Liberal Arts and Sciences
A minor is required, approved by the departmental adviser in Russian
Preparation for the major. Russian 1, 2, 3, 4, 10, and 11 (20 units). Recommended: History $4 \mathrm{~A}-4 \mathrm{~B}$.
Major. Twenty-four upper division units in Russian, to include Russian 101A$101 \mathrm{~B}, 102 \mathrm{~A}-102 \mathrm{~B}$, and 12 units in the period literature of the language.

For the Standard Teaching Credential for Secondary Teaching
Proficiency examination. The requirement for Russian parallels that for German. Preparation for the major. Russian $1,2,3,4,10$, and 11 .
Teaching maior. Twenty-four upper division units in Russian to include Russian 101A-101B, 102A-102B, 140, 141, and six upper division units of Russian in the graduate year, six units of graduate courses in Russian.

## Russian Minor

The minor consists of 15 units in Russian, six of which must be upper division. For elementary teaching, it consist of $20^{\prime}$ units in Russian, six of which must be upper division.
For secondary teaching, it consists of Russian $1,2,3,4,10,11,101 \mathrm{~A}-101 \mathrm{~B}, 102 \mathrm{~A}$ -
2 B , and 130 or 131.
Proficiency examination: as above.

## High School Equivalents

High school foreign language courses may be used for purposes of placement in college courses and may be counted toward meeting the foreign language require ment in various majors. These high school courses will not count as college credit oward graduation.
The first two years of high school German may be counted as the equivalent of German 1; three years the equivalent of German 2; and four years the equivalent of German 3. The last year-course taken by a student in the high school language sequence may be repeated in college for graduation credit, not to exceed four unit
of repeated foreign language work. Parallel provisions apply to Russian

## German



Four lectures and one hour of laboratory.
Pronunciation, oral practice, readings on German culture and civilization, minimum essentials of grammar.
2. Elementary (4) I, II

Four lectures and one hour of laboratory.
Prerequisite: German 1 or two years of high school German.
Continuation of German 1.
3. Intermediate (4) I, II

Prerequisite: German 2 or three years of high school German
A practical application of the fundamental principles of grammar. Reading in German of cultural material, short stories, novels or plays; oral practice.

## 4. Intermediate (4) I, II

Prerequisite: German 3 or four years of high school German.
Continuation of German 3.

## 7A-7B. Intensive Reading Course in German (2-2)

Prerequisites: German 1 and 2 or three years of high school German.
Intensive reading of material from the humanities and social sciences selected for the purpose of developing reading skills in German

## 8A-8B. Scientific Reading (2-2)

Prerequisite: German 2 or three years of high school German.
Readings taken from the fields of chemistry, physics, medicine, zoology, biology, etc.
10. Conversation (2) I, II

Prerequisite: German 2 or three years of high school German.
Practice in the spoken language; practical vocabulary; conversation on assigned topics; simple dialogues and plays.

## 11. Conversation (2) I,

Prerequisite: German 10 or German 3, or four years of high school German.
Continuation of German 10.

## 01A-101B. Oral and Written Composition (3-3)

Prerequisites: German 4 and 11.
Translation into German of moderately difficult English prose. Free composition in German, written and oral. Outside reading of modern German plays and prose, discussions in German. Oral and written practice in conversational German.

## 102A-102B. Survey of Ger

Prerequisite: German 4.
Important movements, authors, and works in German literature from the Middle Ages to the present.

## 03A-103B. German Literature of the Eighteenth Century (3-3)

Prerequisites: German 4 and 11
The literature of the German Enlightenment, the "Storm and Stress," the Classical Age. Outside readings and reports.

## 05A-105B. German Literature of the 19th Century (3-3)

Prerequisites: German 4 and 11.
The literature of German Romanticism, Young Germany, Realism, and Naturalsm . Outside readings and reports.
107. German Literature from its Beginning to the Reformation (3) Prerequisites: German 4 and 11.
Poetry, drama, and prose of the Old High German, Middle High German, and early New High German periods, the early texts to be read in modern German adaptations.
110A-110B. Contemporary German Literature (3-3)
Prerequisites: German 4 and 11.
The main developments in German literature from Neo-Romanticism to the present. Outside readings and reports.
111. Contemporary German Drama (3)

Prerequisites: German 4 and 11.
German drama from Hauptmann to the present.
115. Goethe's Faust (3)

Prerequisites: German 4 and 11.
Goethe's Faust, Parts 1 and 2, its philosophical contents and its position in German and European literature; lectures, reading, reports.
125A-125B. Advanced Oral and Written Composition (2-2)
Prerequisite: German 101A-101B.
Advanced forms of oral and written German.
130. German Syntax and Stylistics (3)

Prerequisites: German 101A-101B.
Theoretical and practical study of the structure of German prose.
140. German Civilization (2) I

Prerequisites: German 4 and 11.
Conducted in German. Primarily for German majors and minors.
German culture from the Middle Ages to the present, with emphasis on the arts,
music and philosophy.
141. German Civilization (2) II

Prerequisites: German 4 and 11
Conducted in German. Primarily for German majors and minors.
Continuation of German 140.
148. Applied German Linguistics (3)

Prerequisites: German 101A-101B.
Linguistic study of modern German; integration of modern linguistic theory with the language classroom.
150. German Phonology (3)

Prerequisites: German 4 and 11.
Sounds, intonation, and elocution of German.
152. Middle High German (3)

Prerequisite: Twelve units of upper division German.
The grammatical structure of Middle High German with readings from the
201. History of the German Language (3)
202. Middle High German Literature (3)
203. The German Novelle (3)
204. The German Novel in the Twentieth Century (3)
205. German Lyric Poetry from Hölderlin to Rilke (3)
206. German Drama of the 19th Century (3)
207. Renaissance and Baroque Literature (3)
208. Goethe (3)
210. Schiller (3)
251. Seminar in Eighteenth-Century Literature (3)
255. Seminar in Nineteenth-Century Literature (3)
260. Seminar in Twentieth-Century Literature (3)
265. Seminar in Germanic Linguistics (3)
290. Research and Bibliography (3)
297. Research (3)
298. Special Study (1-3)
299. Thesis (3)

## Russian

1. Elementary (4) I, II

Four lectures and one hour of laboratory
Pronunciation, oral practice, reading in Russian literature, minimum essentials of grammar.
2. Elementary (4) I, II

Four lectures and one hour of laboratory.
Prerequisite: Russian 1.
Continuation of Russian 1.
3. Intermediate (4) I

Prerequisite: Russian 2 or three years of high school Russian.
A practical application of the fundamental principles of grammar. Reading in Russian of cultural material, short stories, novels or plays; oral practice.
4. Intermediate (4) II

Prerequisite: Russian 3.
Continuation of Russian 3.

## 8A-8B. Scientific Reading (2-2)

Prerequisite: Russian 2 or three years of high school Russian. 8A is prerequisite to 8 B .
Intensive reading in scientific fields.
10. Conversation (2)

Prerequisite: Russian 2 or three years of high school Russian.
Practice in the spoken language; practical vocabulary; conversation on assigned topics; simple dialogues and plays.

## 11. Conversation (2) II

Prerequisite: Russian 10 or Russian 3, or four years of high school Russian
Continuation of Russian 10.

## 40. Russian Civilization (3) I

(Same course as Humanities 52)
Conducted in English.
The major currents and characteristics of Russian culture, as expressed through the centuries in literature, art, philosophy, and music.
41. Russian Civilization (3) II
(Same course as Humanities 53)
Conducted in English.
Continuation of Russian 40.

101A-101B. Conversation and Composition (3-3)
Prerequisite: Russian 4.
Translation into Russian from moderately difficult English prose, with written reports in Russian. Readings and oral discussions of Russian plays and short stories.
102A-102B. Survey of Russian Literature (3-3)
Russian literature from its beginnings, with emphasis on the nineteenth and wentieth centuries.

## 103. Old Russian Literature (3)

Masterpieces of Russian literature before 1700.
104. Russian Literature of the $\mathbf{1 8 t h}$ Century (3)

Russian Classicism and Sentimentalism.
105A-105B. The Russian Short Story, Drama, and Poetry of the 19th Century (3-3)
Development of the Russian short story, drama, and poetry of the 19th Century.
110A-110B. The Russian Novel of the 19th Century (3-3)
Development of the Russian novel of the 19th Century.
111. Russian Literature of the 20th Century (3)

Poetry, prose, and drama of the 20th century.
130. Russian Syntax and Stylistics (3)

Prerequisite: Russian 101A-101B.
The structure of contemporary Russian.
131. Russian Phonology and Morphology (3)

Prerequisite: Russian 4 and 11.
The sounds and forms of contemporary Russian.
140. Russian Civilization (3) I
(Same course as Humanities 152)
Conducted in English.
An advanced course in Russian culture of the past and present, with emphasis on the arts, philosophy, literature, and music.
141. Russian Civilization (3) II
(Same course as Humanities 153)
Conducted in English.
Continuation of Russian 140.
201. History of the Russian Language (3)

202A-202B. Old Church Slavic (3-3)
203. Slavic Linguistics (3)

204A-204B. The Soviet Novel and Short Story (3-3)
205. Russian Poetry from Pushkin to the Present (3)
253. Russian Literary Criticism (3)
255. Seminar: A Major Author or Movement (3)
290. Research and Bibliography (3)

## 298. Special Study (1-3)

299. Thesis (3)

## Greek

## Health Sciences Major

## For the Standard Teaching Credential, Specialization

 in Secondary TeachingPreparation for the major. Health Science and Safety 21, 29, 65; Home Economics 4A; Zoology 8; and Biology 9 or 22 and 23; Sociology 1; and Psychology 1. (24 units.)
Teaching Major (Undergraduafe). A minimum of 36 upper division units to include Health Science and Safety 100, 145, 146, 153, 155, 165, 172; Psychology 106; and Sociology 140. Remaining units to be selected from health science and safety and closely related fields. In addition students must complete School of Education requirements which include Education 121 P and Health Science and afety 151.
Postgraduate Year. Six units of postgraduate courses in the major or minor
acceptable toward the credential.

## Health Sciences Minor

For the Standard Teaching Credential
This minor consists of Education 121P, Health Science and Safety 21, 29, 65, 100,145 , and 146, and six units of electives in health science and safety chosen in consultation with the departmental adviser. Candidates for elementary teaching must in addition take Health Science and Safety 150; candidates for secondary teaching take Health Science and Safety 151.
21. Principles of Healthful Living (2) I, II, $S$

An application of modern knowledge to the development of understandings, attitudes, and practices essential to healthful living. Fulfills statutory requirement
in public safety.

## 29. Physiology of Reproduction (1) I, II

A series of lectures and discussions dealing with normal and abnormal physiology and anatomy of reproduction; facts and frauds in sex hygiene, and related topics.
65. Community Health (3) 1, II

Community health problems; the role of the citizen, of the public, and of com munity health agencies in promoting and protecting the health of the community.
100. Introduction to Health Science and Safety (3) I

History and principles of health science and safety and its role in modern society. An orientation course for students with a professional interest in health science and safety.
101. The Change Process and Health Science and Safety (3)

Prerequisite: Health Science and Safety 21.
Attitude formation, behavior change, decision-making, perception, motivation, group behavior, etc., and their relationship to the practice of health science and
safety.
122. Concepts of Health Science (3) I, II

Development and application of concepts in individual, family, and community health. Involvement in health project work. Not open to students with credit in

## 140. Traffic Safety (3) I

Problems of traffic safety and programs designed to deal with them.
145. Safety Education and Accident Prevention (3) I, II, 5

Principles of safety and safety education as applied to the home, school, industry,
traffic, recreation, and fire prevention.
146. Instructor's Course in First Aid (3) I, II, S

Standard Red Cross course for instructors in first aid plus medical-legal problems of emergency care of accident victims.
147. Traffic Safety and Driver Education (3) I, II, S

Three lectures and one hour of laboratory.
Analysis of traffic accidents; natural and man-made laws; safe use and care of vehicles; instructional approaches and the development of one's own driving and teaching skills.
148. Advanced Driver Education and Driver Training (3) I, II, $\mathbf{s}$

Two lectures and three hours of laboratory.
Prerequisites: Health Science and Safety 145 and 147.
Principles and procedures in organizing and conducting programs in driver instruction with emphasis on behind-the-wheel training. Students will teach high school youngsters to drive.

## 149. Multi-media Techniques in Driver Instruction (3) I, II

Prerequisite: Health Science and Safety 147.
Teaching devices and techniques in driver education and driver training, including multi-media approaches, psycho-physical testing and multiple car driving ranges
150. Health Education for Elementary Teachers (2) I, II, S

Prerequisite: Health Science and Safety 21 or 122.
The teacher's function in the different aspects of the elementary school health program, with emphasis upon the planning and presentation of instructional materials and upon community resources and relationships. Not open to students with credit in Health Science and Safety 151.
151. Health Education for Secondary Teachers (2) I, II, $\mathbf{S}$

Prerequisite: Health Science and Safety 21 or 122.
Health status of adolescents and of the teacher's function in the secondary schoo health program. Emphasis is placed upon statutory requirements in stimulants and narcotics and upon safety and accident prevention. Not open to students with
153. Administration of the School Health Program (3) II

Administrative responsibilities of the school health program. Principles, policies, and practices involved in health instruction, health services, environment, legal implications, and community relationships.

## 154. Workshop in Health Science and Safety (1-3)

Selected problems in health science and safety are used as a basis for workshop experiences. Maximum credit six units; maximum credit three units applicable on master's degree.
155. Sex Education in the Schools (3) I, II

Prerequisite: Health Science and Safety 150 or 151.
Philosophy, current procedures, and materials needed for the development of healthy attitudes and scientific knowledge appropriate to teaching sex education.

## 160. Introduction to Public Health (3)

Prerequisite: Health Science and Safety 65.
Philosophy, development, organization, administration, and legal aspects of public health in the United States. Disease prevention and control, health education, and the other functions and activities of official health departments, voluntary agencies,
165. Communicable and Non-Communicable Diseases (3)

Causes, prevention and control of communicable, degenerative and chronic health
169. World Health (3) II

Prerequisite: Health Science and Safety 65.
Health status of selected populations; international approaches to the attainment of world health. Special emphasis on the work of the World Health Organization.
171. Institute on Current Health Issues (1) S

A critical appraisal and analysis of selected contemporary health issues. May be repeated with different subject matter. Maximum of three units may be applied toward a bachelor's degree.
172. Habit Forming Substances (3) I, II

Stimulants, depressants and hallucinogens; use and abuse.

## 175. Health in Later Maturity (3) I

An approach to the conservation of human resources, with emphasis on understandings, attitudes, and practices related to health in later maturity. Designed for those with a personal or professional interest in the field
176. Health and Medical Care (3) II

Prerequisite: Senior or graduate standing with a major or minor in health education or closely related areas.
Health values, concepts, and attitudes; health products and facilities; hospital care and hospitalization plans; governmental health controls; economic and cultura influences upon health and medical care; professional contributions, relationships, and careers: national and international health programs. Not open to student with credit in Sociology 126.
177. Environmental and Occupational Health (3)

Prerequisite: Health Science and Safety 65.
Environmental hazards of living and working in this modern technological world stressing air pollution, water pollution, and occupational safety.
192. Critical Analysis of Professional Literature (3) II

Investigation and study of selected literature in the field which has important bearing on health, physical education, and recreation programs in the school an community. Evaluation of literature content on basis of specific critera

## 197. Supervised Field Experience (1-3) I, II

Prerequisite: Senior standing and consent of the chairman of the department.
Supervised practical experience in local health agencies.

## 200. Seminar (3)

201. Interdisciplinary Factors in Health Education (3)
202. Measurement and Evaluation in Health Education (3)
203. Administration of Traffic Safety Education (3)
204. School Safety Programs and Procedures (3)
205. Problems in Disease Control (3)
206. Drug Abuse Education (3)
207. Special Study (1-3)
208. Thesis (3)

## Hebrew

## History

## In the College of Arts and Letters

Faculty
Professors: Berge (Chairman), Coox, Hanchett, W., Merrill, Munter, Nasatir, Norman, Pincetl, Rader, Ragen, Ridout, Rohfleisch, K., Ruetten
Visiting Professor: Hurwitz
Associate Professors: Appleby, Cheek, Cox, T., Schatz, Smith, C. D., Smith,
R. T., Starr, Steele, Strong, Weber R. T., Starr, Steele, Strong, Weber

Assistant Professors: Bartholomew, Chu, Cunniff, Davies, Detweiler, Dill, Du-
Fault, Dunn, Filner, Flemion Fault, Dunn, Filner, Flemion, J. Stoddart, Flemion, P., Green, M., Heyman, Hoidal, McDonald, J., Oades, O'Brien, A., Phillips, W. D., Rosen, Stites,

## Offered by the Department

Master of Arts degree in history; and a Master of Arts degree for teaching service with a concentration in history.
Major in history with the A.B. degree in liberal arts and sciences
Minor in history.
Teaching major in history with specialization in secondary teaching.
Teaching minor in history with specialization in secondary teaching.

## Major

With the A.B. Degree in Liberal Arts and Sciences
Preparation for the major. History $4 \mathrm{~A}-4 \mathrm{~B}$, or $8 \mathrm{~A}-8 \mathrm{~B}$, or $9 \mathrm{~A}-9 \mathrm{~B}$, or $17 \mathrm{~A}-17 \mathrm{~B}$.
$(6$ units.) ( 6 units.)
Maior. A minimum of 24 upper division units in history to include History 198 and a minimum of a year of concentration in each of three of the following fields: America; (e) South, Southeast, and Fast Europe; (c) United States; (d) Latin These courses must be selected under the Asia; (f) Africa and the Middle East ment.

## Minor

The minor in history consists of 15 units in history to include six sequence anits in the lower division. Nine units must be in upper division courses, including

## Major

For the Standard Teaching Credential, Specialization in Secondary Teaching
Requirements are the same as the requirements for the undergraduate major for he A.B. degree in liberal arts and sciences, as outlined above, with the major for that a minimum of a year concentration in U.S. history must be included in the apper division work. In addition, students must complete, in the postgraduate year,

## Minor

For the Standard Teaching Credential, Specialization in Secondary Teaching
The minor in history for secondary teaching consists of a minimum of 21 units to $9 \mathrm{~A}=9 \mathrm{~B}$, or $17 \mathrm{~A}-17 \mathrm{~B}$; and 15 additional units in history History $4 \mathrm{~A}-4 \mathrm{~B}$, or $8 \mathrm{~A}-8 \mathrm{~B}$, or $9 \mathrm{~A}-9 \mathrm{~B}$, or $17 \mathrm{~A}-17 \mathrm{~B}$; and 15 additional units in history to include not less than 12

Prerequisite: History 4A is prerequisite to History 4B.
European institutions, culture, and thought from ancient times to the present.

## 8A-8B. The Americas (3-3)

The history of the western hemisphere from its discovery to the present time This year course meets the graduation requirements in American history, institution and ideals. 8B meets the graduation requirement in California State and local government.
9A-9B. Asian Civilization (3-3)
Asian institutions, cultures, and thought from ancient times to the present. Semester I: Traditional Asian civilization. Semester II: Asia since the impact of the West. 17A-17B. American Civilization (3-3)

Prerequisite: History 17A is prerequisite to History 17B.
The political and social development of the United States, with emphasis upon requirement in American history, institutions and year course meets the graduation 17 A , also meets the requirement in U S Cond ideals. The first semester course, course, 17 B , meets the requirement in California state ; and the second semester narily not open to students with credit for Political Science 2,71A 17A-17B may History Department.
101A-101B. The Contemporary World in Historical Prespective (3-3)
Prerequisite: History 4B
Trends and developments in the recent past which can contribute to an understanding of the problems of our age

## 102. Great Historians and Historical Literature (3) I, II

Lectures and readings in the history of history and the works of major historians Open to all upper division students; especially recommended for history and social science majors.

105A-105B. War and Civilization (3-3)
The political and social implications of warfare, of the development of military rechnologies, and of changing concepts of military organization. Semester I: to the present.
111A-111B. Ancient History (3-3)
Fall semester: Greece to the Roman Conquest.
Spring semester: Rome to the 5th century A.D

## 121A-121B. Europe in the Middle Ages (3-3)

Prerequisite: History 121 A is prerequisite to 121 B
European social, cultural, and political developments from the fall of Rome to e Renaissance.
122. The Holy Roman Empire to the Great Interregnum (3)

Prerequisite: History 4A or 121A-121B
The multi-national Holy Roman Empire and its intellectual and social ramificaions. Church-state relationships and the development of constitutionalism

## 123. The Byzantine Empire (3)

The social, political, cultural, and economic development of the Eastern Roman Empire from the crisis of the third century to the fall of Constantinople in 1453 (Formerly numbered and entitled, History 156, The Byzantine Empire and Its
Successors.) Successors.)

## 131A-131B. Renaissance and Reformation (3-3)

Persons and events connected with the social, political, cultural, economic and

History
133A-133B. Europe in the 17 th and 18th Centuries (3-3)
Prerequisites: History 4A-4B.
Europe from the Thirty Years War to the French Revolution. Emphasis is on ostern Europe and the growth of French preponderance. Semester I: The rise egime" to the eve of revolution. The Enlightenment and the nature of the "old
135A-135B. Europe in the 19th Century (3-3)
Prerequisite: History 135A is prerequisite to 135B
Social, political, and economic developments of 19th century Europe.
136A-136B. Intellectual History of Europe in the 19th Century (3-3)
Prerequisite: History 4A-4B. History 136A is prerequisite to 136B.
An analysis of the dominant ideas of the 19th century. Course work is based primarily upon contemporary source materials. (Formerly numbered History 143A-

137A-137B. Europe in the 20th Century (3-3)
Prerequisite: History 137A is prerequisite to 137B.
Political and social developments from 1870 to the present. (Formerly numbered
History 144A-144B.)
138A-138B, Diplomatic History of Modern Europe (3-3)
Prerequisite: History 4A-4B.
Diplomatic relations of the various European states with European and nonEuropean powers. First semester: From the Concert of Europe (1815) to the Era of Realpolitik in the late 19 th century. Second semester: The diplomatic backgrounds and results of two wars. (Formerly numbered History 145A-145B.)
141A-141B. History of Scandinavia (3-3)
The major political, economic, and social developments from the Stone Age to the present. Semester I: Stone Age to 1814. Semester II: 1814 to present.
142A. The French Revolution and Napoleonic Era (3) I
Prerequisite: History 4A-4B.
France on the eve of the Revolution; the Great Revolution, 1789-1799, the Napoleonic Era.
142B. Modern France (3) II
Prerequisite: History 4A-4B.
The development of France since 1815.

## 43A-143B, The Iberian Peninsula (3-3)

A cultural and political survey of Portugal and Spain as well as their empires. Semester I: from medieval tims to early modern period. Semester II: from Modern Spain.)
145A-145B. Central and Eastern Europe (3-3)
Prerequisite: History 4A-4B.
Semester I: Political, social, and intellectual study of the various nationalities inhabiting the area from the Baltic to the Aegean Sea. Semester II: developments since the late 18th century
146A-146B. Germany and Central Europe (3-3)
Prerequisite: History 4A-4B.
The political, social, and cultural record of the Germanic peoples of Northern and Central Europe from Tacitus to the present.

## 147A-147B. Russia and the Soviet Union (3-3)

Semester I: Political, social, and economic development of Russia in Europe and Asia from the earliest times to the present. Semester II: Emphasis on the 20th century.
149. Modern Italy (3)

The development of Italy from 1815 to the present. (Formerly numbered History 151A-151B. England (3-3)
Prerequisite: History 151A is prerequisite to History 151B
Political and social history of England from the earliest times to the present day, stressing the origins of American institutions and social patterns. Recommended for
majors in English.

152A-152B. Constitutional History of England (3-3)
Evolution of the common law and the development of parliamentary institutions.

## 153A-153B. Tudor and Stuart England (3-3)

Semester I: The Age of the Tudors. Semester II: England during the Stuart

## 154A-154B. Modern Britain (3-3)

Semester I: The development of constitutional and social patterns from the Glorious Revolution to the French Revolution, emphasizing the immediate background to the American Revolution. Semester II: The French Revolution, the rise of parliamentary democracy, the Victorian age and the political thought from the Utilitarians to the Fabians.
155A-155B. History of the British Empire and Commonwealth (3-3)
British expansion, the founding of the colonies of settlement, and development of colonial policy. Semester II: Creation of the Commonwealth and the liquidation of the Empire.

157A-157B. History of the Near East from the 7th Century to Modern Times (3-3) Turks. Semester II. The Misern Near Fast and A.D. to the rise of the Ottoman (Formerly numbered and entitled History 157 , Th Arab Ste the West.
(Formerly numbered and entitled History 157, The Arab States, Israel, and Iran.)

## 158A-158B. Africa (3-3)

Semester I: Civilization of pre-colonial Africa both north and south of the Africa.

160A-160B. Latin America (3-3)
Semester I: Colonial Period to approximately 1825. Semester II: Republican Latin America. Not open to students with credit in History $8 \mathrm{~A}-8 \mathrm{~B}$.
161A-161B. Mexico (3-3)
Prerequisite: History $8 \mathrm{~A}-8 \mathrm{~B}$ or $160 \mathrm{~A}-160 \mathrm{~B}$
Colonial and modern Mexico. Semester II: Emphasis on the 20th century.

## 162A-162B. History of Brazil (3-3)

Prerequisite: History $8 \mathrm{~A}-8 \mathrm{~B}$ or $160 \mathrm{~A}-160 \mathrm{~B}$
The fusion of the Portuguese heritage with Indo-American and Negro elements to form the unique culture of the major nation in the tropics. Semester I: Colony and Empire to 1889. Semester II: Republic, 1889-present.
163A-163B. The Caribbean Area (3-3)
Prerequisite: History $8 \mathrm{~A}-8 \mathrm{~B}$ or $160 \mathrm{~A}-160 \mathrm{~B}$
Development of the Caribbean area with emphasis on the 20th century.
164. The Pacific Coast Nations of South America (3)

Prerequisite: History $8 \mathrm{~A}-8 \mathrm{~B}$ or $160 \mathrm{~A}-160 \mathrm{~B}$.
The fusion of the native cultures and institutions with those of Spain to form
the modern nations of the Pacific Coast of South America.

165A-165B. Economic, Social, and Intellectual Development of Latin America (3-3) Prerequisite: History 8A-8B or 160A-160B.
Designed for students in the Latin American Studies program, foreign trade, and foreign service.
167A-167B. Diplomatic History of Latin America (3-3)
Prerequisites: History $8 \mathrm{~A}-8 \mathrm{~B}$ or six units of upper division history.
Origins of Inter-Americanism; relations among the Latin American nations; the origins and development of the American States; Latin America in World Affairs
168. The Platine Nations (3)

Prerequisite: History $8 \mathrm{~A}-8 \mathrm{~B}$ or $160 \mathrm{~A}-160 \mathrm{~B}$
The historical development of Argentina, Uruguay, and Paraguay, with emphasis on the 20th century.
171A-171B. Rise of the American Nation (3-3)
Prerequisite: History 171A is prerequisite to History 171B.
The settlement and development of the British colonies in North America and he American Revolution. Stresses the creation of the American nation through nodification of Old Worid institutions in the new environment.

## 172A-172B. Development of the Federal Union (3-3)

Prerequisite: History 172A is prerequisite to Histor; 172B.
Political, cultural, social and intellectual aspects of the Confederation and early national period; the Convention of 1787 and establishment of the Constitution; the administrations, of Washington through John Quincy Adams. This year-course meets the graduation requirements in American history, institutions and ideals; 172A meets the requirement in U. S. Constitution; and 172B includes materials which meet the requirements in California state and local government.

## 173A-173B. Civil War and Reconstruction: The United States from

Jackson to Grant (3-3)
Lectures and readings on Jacksonian democracy, territorial expansion, the Mex ican War, the slavery controversy, the Civil War and Reconstruction

## 174. The Rise of Modern America, 1868-1900 (3

Economic, social, political, and intellectual developments from the end of the Civil War to the close of the 19th century.
175A-175B. The United States, 1901-1945 (3-3)
The age of reform and the United States as leader of the free world.
175C. The United States in the Nuclear Age (3)
The United States since World War II.

## 176A-176B. American Foreign Policy (3-3)

Semester I: The development of American foreign policy since 1776. Semester II: Developments since 1916. This year course meets the graduation requirement in American history, institutions, and ideals.

177A-177B. Constitutional History of the United States (3-3)
American constitutional history since the establishment of the federal government This year course meets the graduation requirement in U.S. Constitution and in American history, institutions and ideals.
178A-178B. The Development of American Capitalism (3-3)
The changes in agriculture, industry, labor, banking, transportation, and commerce in a capitalist society with emphasis on the prominent personalities who made the changes possible
179A-179B. Intellectual History of the American People (3-3)
The ebb and flow of ideas in the United States since the founding of the English meets the graduation requirement in American history, institutions aideak.
180. Selected Studies in History (3)

Topics in the various fields of history, such as biography, war, science, technology, urbanization, minority groups, immigration, and capitalism. May be repeated for a maximum of six units.
181A-181B. The Westward Movement (3-3)
The American frontier: Expansion, exploration, settlement and building of the new states, with emphasis upon frontier problems of defense, communications finance, etc.; the development of cultural institutions. The causes, effects and the graduation requirement in American history, institutions and ideals.
182A-T82B. The Spanish Borderlands and the American Southwest (3-3)
Semester I: Development and colonization of the Spanish Southwest; the growth and influence of Spanish institutions. Semester II: United States' acquisition of the Southwest; the development and problems of expansion, water, industry, transportation, immigration, culture, and agriculture in the region of semi-aridity.

## 183A-183B. Black American Civilization (3-3)

Semester I: The Black minority group and its contributions and challenges to American civilization. African backgrounds, slavery, the abolitionists, the free Black. Semester II: Ghetto life, leadership personalities, and protest moveme fre (Formerly numbered and entitled History 183, The Negro in American Civiliza tion.)

## 184A-184B. United States History (3-3)

United States history, 1492-present. Primarily for history minors and social science majors and minors. Semester I: to 1877; Semester II: 1877 to present. Not open to students who have completed History 17A-17B or equivalent.

## 185. Conservation History of the United States (3)

The relationship of Americans to their environment from colonial times to the present with emphasis on how attitudes and values have affected personal behavior 189A-189B. Callifornia (3-3)
Political institutions; social, cultural, economic, and intellectual development international background. Semester I: to 1850: Spanish and Mexican heritage Semester II: 1850 to the present. History 189B will fulfill the requirement in California state and local government.
190A-1908. Southeast Asia (3-3)
Semester I: Cultural traditions of Southeast Asian peoples. Indigenous institutions and the infuence of China, India, and islam. Semester II: Southeast Asia in the of the area.
191A-191B. The Far East (3-3)
Particular, but not exclusive, emphasis on Asian-Western relations. Semester I Through the 19th century. Semester II: The 20th century.
192. Chinose Civilization (3) I

Chinese internal history and institutions during the period of relative isolation;
religions, philosophy, literature, and the arts.
193. China in Modern Times (3) II

The impact of the West on China's history and civilization, particularly in the nineteenth and twentieth centuries with emphasis on internal developments.
194. Japanese Civilization (3) I

Japanese internal history and institutions during the period of indigenous development and Chinese influence including religions, philosophy, literature, and the arts.
195. Rise of Japan as a Modern State (3) II

The impact of the West on Japan's history and civilization, particularly in the nineteenth and twentieth centuries with emphasis on internal developments.

96A-196B, The Indian Sub-Continent (3-3)
Semester I: The historical and cultural development of the sub-continent from sub-continent. The internsion res Semester M: British rule and its legacy in the

97A-197B. Intellecfual History of Modern Asia (3-3)
Asian intellectual history during the 19th and 20th centuries, with special attention to social and political thought.
198. The Writing of History (3) $\mathbf{I}$, II

Prerequisite: History major or 12 upper division units of history
Historical method and research in some aspect of history.
201. Seminar in Hisforical Method (3)
202. Seminar in Hisforiography (3)
240. Directed Reading in Selected Topics (3)
241. Directed Reading in United States History (3)
142. Directed Reading in European History (3)
243. Directed Reading in Asian History (3)
244. Directed Reading in Latin American History (3)
245. Directed Reading in African and Middle Eastern History (3)
246. Directed Reading in Ancient and Medieval History (3)
250. Seminar in the Philosophy of History (3)
251. Seminar in United States History (3)
252. Seminar in European History (3)
253. Seminar in Asian History (3)
254. Seminar in Latin American History (3)
255. Seminar in African and Middle Eastern Hisfory (3)
256. Seminar in Ancient and Medieval History (3)
296. Area Studies in Hisfory (1-3)
297. Research (3)
298. Special Study ( $1-3$ )
299. Thesis (3)

## Home Economics <br> In the College of Professional Studies

Faculty
Emeritus: Comin, Talboy
Professors: Cannon, Dorris, Thiel (Chairman), Thomas, A
Associate Professors: Anderson, Z., Campbell, Price, Q., Reed, Somerville
Assistant Professors: Dickerson, Gunning, Hambleton, Kwallek, Martin, J., Mar-
tin, M., Milne, T. Morris, J. Schupp

## Offered by the Department

Master of Science degree in home economics.
Major in home economics with the A.B: degree in applied arts and sciences
Minor in home economics.
Teaching major in home economics with specialization in secondary teaching
Teaching minor in home economics with specialization in secondary teaching

## Major

With the A.B. Degree in Applied Arts and Sciences
The major in home economics is available in two areas of emphasis: (1) nome economics and (2) Food and nutrition.

## General Home Economics

Preparation for the major. Home Economics 2, 3, 15, 35, 40, 45, 70; Anthro Sociolor 1C; Art 2A; Biology 1; Chemistry 2A-2B; Economics 1A; Physics 5; and - (44 units.)

Major. A minimum of 24 upper division units to include Home Economics 100
$15,135,143,151,152,171$, and three units selected from home economics courses

## Food and Nutrition

This program is planned for students interested in qualifying professionally in the student who successfully completes this pront or commercial home economics. A student who successfully completes this program and receives departmental recom
mendation is eligible to apply for a year of internship under mendation is eligible to apply for a year of internship under auspices of the Ameri-
can Dietetic Association. Upon completion of an dietetic internship, or a three-year apprenticeship under a a qualified food clinic or recognized hospital, a student is eligible for membership in qualified dietitian in a Association and recognition as a qualified dietitian. Additional food and Dietetic careers include extension service, teaching, business, health agencies and nutrition
Preparation for the major. Home Economics 2,3, 4A, 15, 35, 40, 45, 70. Biearch. 22; Business Administration 1A; Chemistry 2A-2B, 3; Economics 1A; Physics 5 Sociology 1; and Microbiology 1. ( 50 units.)
Major. Thirty-six units to include Home Economics $100,102,103,104,105,106$ Business Administration.

## Minor

The minor consists of 18 units in home economics, six of which must be upper
division.

## Major for the Standard Teaching Credential

For specialization in secondary teaching, the requirements are the same as for graduate year students must in general home economics. In addition, in their as for graduate year students must complete six units in home economics selected with
approval of the adviser.

## Minor for the Standard Teaching Credential

For specialization in secondary teaching, the minor consists of 20 units of home economics, six of which must be upper division. The courses must be approved by

1. Fundamentals of Home and Family Life (3) I, II

General concepts of family relationships and effective use of family resources General Education course open to men and women. Not open to Home Economic
2. Orientation to Home Economics as a Profession (1) I, II

Introduction to the opportunities and requirements in various professional fields for home economists.
3. Food Selection and Preparation (3) I, II

One lecture and six hours of laboratory.
The production, selection, composition, preservation, nutritive value and prepa-

4A. Fundamentals of Nutrition (3) $\mathbf{I}$, II
Nutrition as applied to the stages of the normal life cycle.

## 4B. Nutrition Laborafory (1) Irregular

Three hours of laboratory.
Prerequisite: Limited to students in the nursing program.
Principles of nutrition applied to food preparation, meal planning, and special diets.

14-5. Workshop for School Lunch Personnel (1)
Open to school lunch personnel only.
The following areas are included:
A. Nutrition for School Lunches.
B. Beginning Meal Planning.
C. Food Purchasing.
D. Sanitation and Safety.
E. Work Simplification and Personnel Management.
F. Advanced Menu Planning.
G. Record Keeping and Cost Analysis.

No area may be repeated for credit, but credit may be earned in two areas concurrently. Maximum credit seven units. May not be used as part of a major or minor in home economics or homemaking education.

## 15. Clothing and Textiles (3) I, II

One lecture and six hours of laboratory.
Commercial patterns and their adaptation; fitting and construction; selection and care of textiles.

## 19. Textiles (3) I, II

One lecture and six hours of laboratory.
Fibers, yarn, fabric construction, and finishes as related to selection, use, and care.
23. Fabric Structure and Design Processes (3) I, II

Six hours of activity.
Prerequisite: Art 2A
A study of stitchery, knitting, crocheting, weaving, macramé, and textile decoration.
35. Marriage and Family (3) I, II

Love, maturity, dating, compatibility, conflict as they relate to preparation for uccessful marriage and family living. Not open to students with credit in Social Welfare 30, or Sociology 35 .

## 40. Family Income Management (3) I, II

Financial problems involved in the effective management of the family resources.
45. Fundamentals of Housing and Design (3) $\mathbf{I}$, II

One lecture and six hours of laboratory.
Prerequisite: Art 2A.
Historical and contemporary interiors. Architectural, constructural, and artistic factors of housing as related to family needs.
70. Principles of Child Development and Guidance (3) I, II

Three lectures and one hour of observation.
Prerequisites: Psychology 1 and Sociology 1.
Growth and development of the child from conception through adolescence; his
relationships with his family and peers; and implications for guidance.
Not open to students with credit in Psychology 106, or Education 111.

## 100. Advanced Foods (3) I, II

One lecture and six hours of laboratory.
Prerequisites: Home Economics 3 and Chemistry 2B.
Fundamentals and practices of scientific food preparation. Development of standards in food preparation, meal planning, and service.

## 101. Family Food Managament (3) I

Six hours of laboratory.
Not open to home economics majors and minors.
Planning, organizing, preparing and serving attractive well balanced meals for different income levels, for various occasions.
102. Advanced Nutrition (3) I, II

One lecture and six hours of laboratory.
Prerequisites: Home Economics 4A and Chemistry 2B.
Fundamental principles of human nutrition; planning, calculating and evaluating dietaries to meet human requirements; animal feeding experiments.
103. Quantity Cookery (3) I

One lecture and six hours of laboratory.
Prerequisites: Home Economics 100 and Business Administration 1A.
Application of basic principles to quantity foods, including experiences in planning, purchasing, storage, preparation, serving and cost accounting for institutional food service. Laboratory experience is provided in the campus cafeteria and in
04. Institufional Food Organization and Management (3)

One lecture and six hours of laboratory
Prerequisites: Home Economics 103.
Problems involved in the organization of food service units, problems of administration, cost of food service, specifications, operation and care of equipment for institutions, and routing of work. Special projects and field trips.

## 105. Experimental Foods (3) II

One lecture and six hours of laboratory
Prerequisite: Home Economics 100.
Physical and chemical tests applied to problems in processing and preparation of food. Studies relate to protein foods; batters, doughs and sugar cookery; emulsions, fats and oils; and developments in food preservation.
106. Diet Therapy (3) I

One lecture and six hours of laboratory.
Prerequisite: Home Economics 102.
Planning and preparation of special diets and food requirements in pathological conditions.

## 08. Advanced Institution and Restaurant Management (3) Irregular

One lecture and six hours of laboratory.
Prerequisites: Home Economics 103 and 104.
Purchasing food and selecting and maintaining equipment based on the needs of various types of food service and institutional layout.

## 109. Meal Management and Service (3) I, II

One lecture and six hours of laboratory.
Prerequisites: Home Economics 3 and 4A.
Planning, organizing, preparing, and serving meals with consideration of nutritional needs and the time, energy, and money resources available.

## 115. Advanced Clothing (3) I, It

One lecture and six hours of laboratory.
Prerequisite: Home Economics 15.
Fitting and construction processes applied to wool, silk, and synthetics, emphasizing fundamental principles of handling.

## 116. Advanced Clothing Design (3)

One lecture and six hours of laboratory.
Prerequisite: Home Economics 115.
Principles of tailoring; planning and construction of coats and suits.
117. Clothing Selection (3) I, II

Appropriate clothing for the individual and the family. Basic art principles, fashion trends, history of costume, buying practices; current legislation in textiles and clothing.
118. Flat Paftern Design (3) II

One lecture and six hours of laboratory.
Prerequisites: Home Economics 115 and Art 2A
Problems involving principles and techniques of flat pattern construction. Development of basic sloper for purpose of interpreting new designs. Investigation sources of inspiration and their relationship to significant trend in design.
119. Textile Analysis and Testing (3) II

One lecture and six hours of laboratory.
Prerequisites: Home Economics 15 and Chemistry 2B.
Analysis based on physical and chemical tests for quality differences due to variation in fibers, content, structure, and finishes and their suitability for specified uses.
120. Clothing and Human Behavior (3) II

Prerequisite: Consent of instructor.
Socio-economic influences on consumer clothing behavior patterns.
121. Clothing Design: Draping (3) I

Six hours of activity.
Prerequisite: Home Economics 15
Experience in creative designing through fabric manipulation. Designer problems related to mass-production techniques.
22. Clothing Design: Historical Influences (3)

One lecture and six hours of laboratory.
Prerequisite: Home Economics 115.
Chronological analysis of men's and women's fashions providing inspiration for original creations in clothing design.
23. Fabric Structure and Design Processes (3) I, II

Six hours of activity.
Prerequisite: Art 2A.
A study of stitchery, knitting, crocheting, weaving, macramé, and textile decora-

## 135. Family Interaction (3) I, II

Prerequisites: Psychology 1, and Home Economics 35.
Marriage adjustment and family interaction throughout the family life cycle
136. Family Study (3) I, II

Prerequisite: Home Economics 35.
Dynamics of family living; attitudes, practices, social and psychological inter action, and family life patterns in different cultures, social classes and ethnic groups.
(Formerly Home Economics 135.)

## 140. Family Financial Problems and Practices (3)

Prerequisite: Home Economics 40.
Financial problems and practices of families; decision-making with market goods and services; consumer protection programs.

## 143. Household Equipment and Processes (3) II

One lecture and six hours of laboratory.
Prerequisite: Physics 5 and Chemistry 2B.
Study and laboratory experience to acquaint students with current research characteristics and composition of and household supplies. Emphasis placed upon

## 45. Family Housing (3) II

One lecture and six hours of laboratory.
Prerequisite: Home Economics 45
Advanced housing problems at various stages of the family life cycle and the
ifferent socio-economic levels.

## 50. Principles of Home Management (3) I, II

Open to both men and women, but not open to home economics majors
Efficient management of the home, family cooperation in Home Economics 151 .

## 151. Home Management Theory and Analysis (3) I, II

Prerequisite: Home Economics 40 .
Management process and its relationship to the use of resources based upon the tion techniques for use in studies of activities inily. Adaptation of work simplifica-
152. Home Management Laboratory (3) I,

Five weeks' residence in a family-size unit.
Prerequisites: Home Economics 40, 151, and written request made to department chairman one year prior to enrollment.
Application of theories and principles of all disciplines of home economics.
153. Supervised Field Work in Home Management (3) I, II

Prerequisites: Home Economics 3, 40, 135, 151, 171 and consent of instructor.
Management and social problems as they relate to the home and family. Supervised field work with various community agencies and selected families.

## 60. Merchandise Analysis (3) in

Contemporary problems of production and distribution of textiles and clothing.
70. Human Development: Infancy (3) I, II

Prerequisite: Home Economics 70.
Physiological, psychological, social and cultural development and behavior of the human organism through age two

## 1. Human Development: Early Childhood (3) I, II

Two hours of laboratory prearranged
Prerequisite: Home Economics 70
Development, behavior, and guidance of the preschool child. Observing, recording and interpreting behavior.

## 75. The Nursery School Program (3) I

Two lectures and two hours of participation.
Prerequisite: Home Economics 171.
Types of programs for the nursery school with consideration of methods and materials evaluated in terms of needs of young children.

## 6. Creailve Experionces for Young Children (3)

Prerequisite: Home Economics 175.
Exploration of spontaneous creativity at the preschool age; evaluation of materials best suited for use in art, music, dance, and language for the young child
177. Administration and Supervision in Nursery Schools (3) Irregular

Prerequisites: Home Economics 175 and 176 or teaching experience in a nursery school.
Problems of organization in conducting schools for young children; interrelationships of staff; personnel practices; communication with teaching staff, parents, and community; records and reports.
178. Methods and Materials in Parent Education (3) I

Prerequisite: Consent of instructor.
An investigation of philosophy, curriculum instruction, current trends, and issues in the teaching of child guidance to parents.

## 179. Advanced Child Study (3) I, II

Prerequisites: Nine units in child development.
Readings and interpretations of scientific literature which contribute to an understanding of child behavior. Physical, social, and psychological factors which determine the direction of human development
180. Food Demonstration Techniques (3) I, I

One lecture and six hours of laboratory.
Prerequisite: Nine units in home economics courses.
Organizing materials and developing techniques for demonstrations; observation, evaluation and participation in professional demonstrations for photography, the classroom and mass media.

## 181. Materials and Techniques for Teaching Home Economics (2) I

Two hours activity
Prerequisite: Education 121C or concurrent registration.
Development and use of audio-visual and other instructional materials.

182. Educational Practices and Instruetional Resources (3)

Prerequisite: Fifteen units of home economics.
Principles of learning as they relate to teaching home economics to adults.
Organization of material selection, use and evaluation of teaching techniques.
190. Advanced Studies in Home Economics (2-6) Irregular

Prerequisite: Twelve upper division units in home economics.
Advanced study of selected topics. Maximum credit nine units.
No more than six units may be applied toward either the bachelor's or master's degree.
200. Seminar: Foods and Nutrition (3)
203. Advanced Readings in Food Technology (3)
204. Advanced Readings in Nutrition (3)
205. Assay for Nutrients in Foodstuffs and Tissues (3)
206. Physiological Bases of Diet Therapy (3)
207. Child Nutrition (3)
215. Seminar: Clothing (3)
216. Seminar: Textiles (3)
219. History of Textiles and Clothing (3)
231. Family Life Education (3)
234. Seminar: Marriage Adjustment (3)
240. Seminar in Family Economics (3)
251. Seminar in Home Management (3)
270. Seminart Child Development and Guidance (3)
271. Advanced Readings in Human Development (3)
281. Seminar: Home Economics Education (3)
282. Current Developments in Home Economics Education (3)
290. Bibliography and Methods of Research (3)
298. Special Study (1-3)
299. Thesis (3)

## Humanities <br> An Interdisciplinary Program Administered by the Dean of the College of Arts and Letters

## Offered by the College

Teaching minor in Humanities, with concentration in Latin, for secondary teaching. See Education.
Curriculum in Humanities. See Interdisciplinary and Preprofessional Programs. All classes are conducted in English.

## 30A-30B. The Legacy of Israel (3-3) $\mathbf{I}$, II

Judaic culture from the post-biblical period to the present, its nature, development, values, and interactions with other cultures. Semester I: post-biblical period through the Renaissance; Semester II: Spinoza to the present.

## 40. Mythology (3)

Major myths of the Western world in ancient and modern versions.
42. French Civilization (3) I

The major currents and characteristics of French culture, as expressed through the centuries in literature, art, and philosophy.
43. French Civilization (3) II

Continuation of Humanities 42.
44. German Civilization (3) I

Not open to majors or minors in German.
The major currents and characteristics of German culture, as expressed through the centuries in literature, art, and philosophy.
45. German Civilization (3) II

Not open to majors or minors in German
Continuation of Humanities 44
48-S. European Civilization (3) S
The civilization of Europe through a conducted travel tour
52. Russian Civilization (3) I

Same course as Russian 40
The major currents and characteristics of Russian culture, as expressed through the centuries in literature, art, philosophy, and music.
53. Russian Civilization (3) II

Same course as Russian 41
Continuation of Humanities 52 .
54. Italian Civilization (3) I

Same course as Italian 40
The major aspects of Italian civilization with particular emphasis upon literature, art, philosophy, music, and history.
55. Italian Civilization (3) I

Same course as Italian 41.
Continuation of Humanities 54.
58. African Culture and Civilization (3) II

An interdisciplinary survey.

- 81517

59A-59B. The Asian Heritage (3-3)
An interdisciplinary year course on the cultures of Southern, Southeastern, and Eastern Asia, with emphasis on the interaction of ideas, pouthern, Southeastern, and ment.

## 66A-66B. Honors Colloquium (3-3)

Prerequisite: Sophomore standing and admission to the special advising program.
Interdisciplinary conference, with readings, discussion, reports.

## 138. Introduction to Aesthetic Appreciation (1)

Same course as Comparative Literature 138.
Major forms of expressions and aesthetic experience in art, music, and literature discussions.

## 142. French Civilization (3) I

French culture of the past and present, with emphasis on the arts, philosophy, and literature. Lectures, class discussions, outside readings, written reports on in-
dividual topics.

## 43. French Civilization (3)

Continuation of Humanities 142.

## 48-S. European Civilization (3)

The civilization of Europe through a conducted travel tour

## 150A-150B. The Cultural Heritage of Europe I (3-3) I

European history, literature, philosophy, art, and music from the Middle Ages Gothic, Renaissance, Baroque, Rococo, and Classicism movements: Romanesque,

## 151A-151B. The Cultural Heritage of Europe II (3-3) II

European history, literature, philosophy, art, and music during the 19th and 20th
centuries, stressing major cultural movements Symbolism, Expressionism, Existentialism, and Stressing Romanticism, Realism, Naturalism , Existentialism, and Structuralism.
152. Russian Civilization (3) I

Same course as Russian 140.
Russian culture of the past and present, with emphasis on the arts, philosophy,
literature, and music.
153. Russian Civilization (3) II

Same course as Russian 141.
Continuation of Humanities 152.
154. Italian Civilization (3)

Same course as Italian 140
The major aspects of Italian civilization with particular emphasis on literature
rt, philosophy, music, and history.
155. Italian Civilization (3) II

Same course as Italian 141.
Continuation of Humanities 154.

## 60. The Quest for European Unity (3)

Prerequisite: A year course in Western Civilization.
The movement for European unity: background, manifestations, and obstacles.
170. The Humanities and Modern Man (1) Irregular

Lectures open to the public. May be repeated for a total of three units. ing and reports required of students enrolled for credit, and cultural history. Read-
180. Study of American Culture (3) I, II S

American Studies as a discipline, the critical methods of the field, the variety of materials for interdisciplinary study.

## 190. Symposium on European Studies (1) S

A series of lectures and discussions on various aspects of current Euroepan developments with particular emphasis on efforts toward European coordination cooperation, and integration. May be repeated with new content. Maximum credi three units.
198. Integration in the Humanities (3) I, II

The investigation of topics common to two or more departments, with oral and written reports. Required of all senior majors in divisional programs in humanities, and open to seniors with majors in English, foreign languages, history, and philosophy.

## Industrial Arts

## In the College of Professional Studies

Faculty
Emeritus: Ford, Luce
Professors: Anderson, W., Irgang, McLoney (Chairman), McMullen, J. D., Thiel Associate Professors: Aguirre, Bailey, G., Hammer, Simons
Assistant Professors: Blackmun, Dirksen, Fukamizu, Guentzler, Lybarger, Mar-
sters, McEowen Lecturer: Ferree

## Offered by the Departmen

Master of Arts degree in industrial arts.
Major in industrial arts with the A.B. degree in applied arts and sciences.
Minor in industrial arts.
Teaching major in industrial arts with specialization in secondary teaching. secondary teachng.

## Major

## With the A.B. Degree in Applied Arts and Sciences

Preparation for the major. Industrial Arts 11, to be taken at the beginning of
the major; five courses selected from Ind the major; five courses selected from Industrial Arts 10, 15, 21, 31 , beginning of and 81 ( 17 units).
Major. A minimum of 24 upper division units to include a of the following fields: industrial drawing, general metalworking woodworking, electricity-electronics, transportation, graphic arts, industrics, general and photography.

## Minor

The minor consists of 20 units in industrial arts to include Industrial Arts 11 21, and one lower division and one upper division course in each of two of the following fields: general woodworking, electricity-electronics, transportation, industrial crafts, industrial drawing, photography, plastics, and graphic arts. Choose
electives in consultation with the adviser.

## Major for the Standard Teaching Credential

For specialization in secondary teaching, the student must fulfill the requirements
or the A.B. degree in applied arts and sciences and in for the A.B. degree in applied arts and sciences and, in his postgraduirements andergraduate major: Industrial Arts 201 selected in the same two areas used for the

Minor for the Standard Teaching Credentia
The minor in industrial arts for the standard teaching credential, with specializa tion in either elementary or secondary teaching, consists of 26 units th specializaIndustrial Arts 10 and nine units selected from the following lower division Industrial Arts $10,15,21,31,40,51,61,71$, and 81 ; and in the upper division, courses:
units from the following two-course selver and 112, 115 and 116,121 and 123,131 sequences: Industrial Arts 101 and 102111 163,171 and 173,181 and 183 . 123,131 and 133,140 and 142,151 and 153,161 and
5. General Industrial Arts Laboratory (3) I, II

One lecture and six hours of laboratory.
Open to all students. A general education elective course.
Practical utilization of tools and materials with emphasis on drafting, metalwork-
ing, and woodworking. Individual projects, field trips, and audio-visual materials
6. Survey of Electronics (3) I, II

One lecture and six hours of laboratory.
A non-mathematical survey of electronics, practical utilization of tools and equipment of today's industry

## 10. General Crafts (3) I, II

One lecture and six hours of laboratory.
The practical utilization of tools, materials, and methods employed in industrial craft areas. The fundamentals of good design

## 11. Orientation to Industrial Arts (2) I, II

Required of all industrial arts majors during their first semester
The history and philosophy of industrial arts with emphasis on the current status and development of the secondary school curriculum. Discussion of professiona requirements, obligations, and development.

## 15. General Plastics (3) I, II, S

One lecture and six hours of laboratory.
Production methods, mechanical and physical properties, composition of plastics The basic processes: molding, casting, thermoforming, reinforcing, and foaming.

## 21. Industrial Drawing (3) I, II

One lecture and six hours of laboratory.
Fundamental theories, procedures, and techniques of modern industrial drafting study and practice intended to develop skill and judgment in application to drafting as the universal language of industry.

## 31. General Mefalworking (3) I, II

One lecture and six hours of laboratory.
Exploration of basic materials and methods employed by industry to produce metal products. The attainment of knowledge and skills involved in the primary fabrication techniques
machine, and welding.
40. Introduction to Photography (3) I, II
(Same course as Telecommunications and Film 20)
One lecture and six hours of laboratory.
A consideration of photographic optics and chemistry; nature of light and image formation; photographic emulsions, exposure and development. Composition and lighting. Not open to students with credit in Journalism 50 . (Formerly numbered Industrial Arts 85.)

## 51. General Woodworking (3) I, II

One lecture and six hours of laboratory.
Theories, practices, and basic problems of working in wood; safety practices. The use of hand tools, the science of working with wood, and the techniques of student personnel management.
61. Basic Electronics (3) 1, II

One lecture and six hours of laboratory.
Planning, designing, constructing, and experimenting to develop skills and acquire knowledge in the electronics field. Basic principles, their application to modern electronic equipment, and correct use of common hand tools and simple test equipment.

## 71. General Transportation (3) $\mathbf{I}, \mathbf{I I}$

One lecture and six hours of laboratory.
The design, theory of operation, and repair procedures of various types of transportation equipment. Development of basic skills in the maintenance of equipment for land, sea, and air transportation.
81. General Graphic Arts (3) I, II

One lecture and six hours of laboratory.
The theory and practice in planning, designing, and processing in the various graphic reproduction activities involving type, stencils, paper, and other allied

## 101. Industrial Arts Crafts (3) 1,

One lecture and six hours of laboratory
Prerequisite: Previous industrial arts experience.
Emphasis on skills in the industrial arts crafts by laboratory experiences in such sign and in utilization of materials. leather, and mosaics. Stress on creativity in de-

## 102. Advanced Industrial Arts Crafts (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 101
Advanced techniques of industrial arts crafts. Development of audio-visual aids and other pertinent laboratory problems.

## 103. Advanced Industrial Crafts (3) I, II

One lecture and six hours of laboratory
Prerequisite: Industrial Arts 102.
Advanced techniques of industrial crafts. Concentration on the design of craft projects with best utilization of materials. Development, in at least three area specified by the instructor, of individual exhibits showing originality
105. Workshop in Instructional Materials (3)

One lecture and six hours of laboratory.
Industrial arts laboratory experiences adapted to the individual needs of experi enced elementary and secondary school teachers; practice in use of tools common to problematic needs. Preparation of materials and instructional aids for classroom
use. Not open to industrial arts majors.
111. Comprehensive Industrial Arts (3) I, II

One lecture and six hours of laboratory.
Prerequisites: Previous industrial
Principles, techniques, and arts experience.
a multiple, activity program. Individual opportunity meeting problems involved in selected industrial arts activities, uivilizing opportunity to explore each area rials.
112. Organization of Comprehensive Industrial Arts (3) $\mathbf{1}, \mathbf{I I}$

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 111.
Planning a multiple activities program; selection and organization of subject studies.
115. Industrial Arts Plastics (3) I, II, $\mathbf{s}$

One lecture and six hours of laboratory
Prerequisite: Industrial Arts 15.
Production of plastic products. Design and use of basic tooling: dies for injection and compression molds, forms for lamination and reinforcement, and molds for
thermoforming.
116. Intermediate Industrial Arts Plastics (3) I, II, s

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 115.
Techniques of tooling production and plastics processing; physical and ical properties of various plastics; selection of plastic materials. physical and mechan-

Industrial Arts
117. Advanced Industrial Arts Plastics (3) I, II, S

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 116.
Composition of basic plastics and its relationship to processes; the structure of plastic resins, catalysis, and the effects of environment.
121. Intermediate Industrial Drawing (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 21.
Complex theories and techniques of graphic delineation. Activities selected to develop individual competence.
122. Advanced Industrial Drawing (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 21.
Architectural drafting, primarily in small home planning. Development of drafting skills and understanding of good contemporary home design.
123. Industrial Arts Drawing (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: Industrial Arts 21.
Practice in and analysis of modern industrial drafting techniques and theories.
131. Intermediate Metalworking (3) $\mathbf{I}$, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 31.
Advanced study of metal fabrication with emphasis on the theory and operation of metalworking machines. Laboratory activities on a selective basis to provide for the development of individual competence.
132. Advanced Metalworking (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 131.
Manufacturing processes, including material selection, production procedures, methods of assembly, and finishing. Emphasis on selection, distribution, and utilization of metal products.
133. Industrial Arts Metalworking (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 131.
Theory and practice in organization and management of industrial arts metal working facilities, including material procurement, equipment selection, and maintenance.

## 140. Photography for Teachers (3) I, II

One lecture and six hours of laboratory.
Designed for more mature students to learn photographic skills useful in teaching. (Formerly numbered Industrial Arts 185.)
141. Intermediate Photography (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: Industrial Arts 40 or 140.
Exposure theory, sensitometry, contrast control, specialized development, distortion and perspective control, and advanced studies of photographic lenses and equipment.
142. Advanced Photography (3) I, II

One lecture and six hours of laboratory
Prerequisite: Industrial Arts 85.
A consideration of advanced negative control, projection printing techniques, composition and editorial content, architectural and illustrative photography, and
43. Advanced Problems in Photography (3)

One lecture and six hours of laboratory
Prerequisite: Industrial Arts 141.
Technical problems and techniques in photography.

## 44. Color Photography (3)

Two lectures and three hours of laboratory.
Prerequisite: Industrial Arts 141
Exposure and processing techniques as applied to current color films and papers in relation to the theory of color photography.

## 151. Intermediate Woodworking (3) I, II

One lecture and six hours of laboratory
Prerequisite: Industrial Arts 51.
Experience in the use of selected woodworking machines which offer opportunities for the development of construction activities in wood. Emphasis on creative design, sound safety practices, and techniques of personnel management.
152. Advanced Woodworking (3) I, II

One lecture and six hours of laboratory
Prerequisite: Industrial Arts 151.
Designed to increase professional skills, craftsmanship, advanced technical skills,
nd equipment maintenance procedures. and equipment maintenance procedures.
153. Industrial Arts Woodworking (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 152
Industrial arts woodworking resources and materials; experience in industrial arts planning, laboratory and equipment organization, and personnel management.

## 161. Intermediate Electronics (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 61.
Development of skills through planning, designing, constructing, and experiment of power, transmission, communication, radio and television electronics to the uses

## 162. Advanced Electronics (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 161.
Development of advanced skills with application to industrial electronics. Tech ent equipment and analysis of electronic devices.

## 163. Industrial Electronics (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 162.
Advanced problems in industrial electronics circuit development, analysis, theory,
164. Basic Digital Computers (3)

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 162.
Functions of circuitry as applied to switching, timing and pulse circuits. Basics
of computer digital logic.
165. Analog Computer Fundamentals (3)

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 162.
Introduction to electronic analog circuits, with emphasis on instrumentation and measurement techniques.
171. Intermediate Transportation (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 71.
Advanced study of the operating principles and maintenance procedures of selected types of transportation equipment. Emphasis on automotive engines, electrical systems, and automatic transmissions.
172. Advanced Transportation (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 71.
Theory and use of various types of diagnostic test equipment. Emphasis on automotive power accessories.

## 173. Industriai Arts Transportation (3) I, 1

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 171.
Advanced techniques in testing and analysis of power units common to transAdvanced rectustry. Emphasis on organization and administration of industrial arts transportation facilities.
181. Intermediate Graphic Arts (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Industrial Arts 81.
Activities in the various graphic arts with emphasis on new technology in the industry.
182. Advanced Graphic Arts (3) 1, I

One lecture and six hours of laboratory
Prerequisite: Industrial Arts 181.
Planning of activities and perfecting of skills in printing and publication; efficient Planning of activines and equipment.

## 183. Industrial Arts Graphic Arts (3) I, II

One lecture and six hours of laboratory
rerequisite: Industrial Arts 181
Advanced techniques in developing skills involved in graphic arts facilities.

## 190. Experimental Industrial Arts (1 or 2) 1, 1

Prerequisite: Consent of instructor.
Individual laboratory work on complex projects on an experimental basis. May be epeated with consent of instructor

## 23. Industrial Arts Organization and Management (2) 1, 1

## Two lectures.

The organization of industrial arts in secondary schools, review of project re quirements and methods of developing student participation in personnel manage ment.

## 194. Recent Trends in Industrial Arts Education (2) I, I

Two lectures.
Current trends and practices in the field of industrial arts in secondary education There will be opportunity for individual work on related problems of interest There wirs of the class.

198. Senior Project (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Consent of instructor.
Each student will work on a project in a selected industrial arts activity area
200. Seminar (3)
201. Advanced Teaching Problems (3)
202. Industrial Arts Problems in Graphics and Design (3)
203. Industrial Arts Problems in Metalworking (3)
204. Problems in Photography (3)
205. Industrial Arts Problems in Woodworking (3)
206. Problems in Electronics (3)
207. Industrial Arts Problems in Transportation (3)
208. Industrial Arts Problems in Graphic Arts (3)
15. Problems in Plastics (3)
220. History and Philosophy of Industrial Education (3)
221. Curriculum Construction in Industrial Arts Education (3)
222. Instructional Resources for Industrial Arts Education (3)
223. Evaluation in Industrial Arts Education (3)
224. Organization, Administration and Supervision of Industrial Education Pro-
grams (3)
267. Field Work in Industrial Arts (3)
290. Research Procedures in Industrial Arts (3)
295. Selected Topics in Industrial Arts (3)
298. Special Study (1-3)
299. Thesis (3)

## Italian

See French and Italian.

## Japanese

See Classical and Oriental Languages.

## Journalism

## In the College of Professional Studies

## Faculty

Professors: Julian, Wimer
Associate Professors: Buckalew, Holowach, Odendahl (Chairman), Sorensen Assistant Professors: Haberstroh, Spevak, Whitney, F.

## Offered by the Department

Major in journalism with the A.B. degree in liberal arts and sciences.
Teaching major in journalism with specialization in secondary teaching.
Minor in journalism.
Teaching minor in journalism with specialization in secondary teaching

## Major

With the A.B. Degree in Liberal Arts and Sciences
A minor is not required with this major; however, several minors are available to increase the scope of training for careers in journalism. Available are those in business administration for students interested in advertising or newspaper managementaning to enter public relations should work out with their advisers a pattern of courses from other departments to supplement requirements for a major in journalism.
Preparation for the major. Journalism 50, 51A, and 51 B (9 units).
Major. Twenty-four upper division units in journalism to include Journalism $102,117,121$, and 104 or 151, and one year's enrollment in 124, 125, or 192.

## Minor

The minor in journalism consists of 15 units in journalism, nine of which must be upper division.

## Major for the Standard Teaching Credential

For specialization in secondary teaching, the requirements are as follows:
Preparation for the major. Journalism $50,51 \mathrm{~A}$, and 51 B . (9 units.)
Teaching Major (Undergraduate). A minimum of 24 upper division units in purnalism to include Journalism 102, 117, 121, and 151 or 104, and one year's enrollment in 124, 125, 192 or 193.

Postgraduate Year. Six upper division or graduate units in journalism.

## Minor for the Standard Teaching Credential

The minor in journalism for secondary teaching consists of not less than 20 units to include in the lower division, Journalism $51 \mathrm{~A}, 51 \mathrm{~B}$; and in the upper division Journalism 102, 151 and 192. Additional journalism electives must be taken to complete the mis 49, 152, and 193. Students selecting this minor must have an academic are Journalism 49, 152, and 193. Students selecting this minor must have an academic major.
49. Introduction to Mass Communications (3) I, II

The work of mass media, their interrelationships, and the services they perform for society; common problems and responsibilities of the mass media; training and background needed in different media
0. News and Feature Photography (3) I, II

Two lectures and three hours of laboratory
An elementary course designed primarily for students of journalism and public contact and projection professional photographic equipment and film processing; tures. Not open to students with credit

## 1A. News Reporting (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: Sophomore standing and ability to type
valuating, and writing the basic types intensive laboratory practice in gathering,

## 18. Advanced News Reporting (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: Grade of C or better in Journalism 51A.
Work includes some reporting in writing the more complex types of news stories
92. Newspaper Production (1-3) 1, It
92. Newspaper Production (1-3) I, II

Three hours of laboratory required for each unit. Total credit in Journalism 92
or its equivalent, may be counted in the total required ee units of Journalism 92, Special work in me total required for graduation.
ing, editing, taking and processing arrangement with the instructor. Includes report ing, editing, taking and processing pictures, working with the printer, proofreading
in production of The Daily Aztec.
93. Yearbook and Magazine Production (1-3) I, II

93 hree hours of laboratory required for each unit. Total credit in Journalism 92 93,192 , and 193 limited to eight units.
Special work in yearbook and magazine production by arrangement with the instructor. Includes editing and photographic work on Del Sudoeste and with the
magazines. magazines.

## 101. Magazine Article Writing (3) II

Gathering material and writing articles for specialized areas, with emphasis on the rusiness press. Production of eight articles and marketing of at least one on the
required.

## 02. Law of Mass Communications (3) I, II

Libel, defamation, privacy, censorship, advertising laws, postal regulations, and of communicators in reporting public affairs.

## 103. Magazine Editing (3)

Mechanics of the editorial process in magazines, with emphasis on industrial and
usiness publications; selection and preparation usiness publications; selection and preparation of editorial material industrial and dummies; special paptioning; graphic production processes; layout; preture selec-
04. Radio and Television News (3) I, II
(Same course as Telecommunications and Film 112)
Gathering, writing, and editing news in special form
television; processing wire service copy, still pictal forms required by radio and ing, and scripting news on motion pictures; using, and kinescopes; filming and events.
105. Editorial Writing (3) I

Principles and policies of editorial composition for mass communications media

## 107. Technical Writing (3) il

Reporting technical developments in nontechnical language. Techni ing and editing primarily for nonmajors in journalism.

American journalism from colonial times to the present, with special attention to radio and other mass media which have entered the news and entertainment field; the relation of their development to society.
118. The Foreign Press (3) I

The four theories of the press. Flow of international news. Analysis of the foreign media. Problems of propaganda, governmental control, language, and economic support
121. Current Problems in Mass Communications (3) I, II

Forces affecting American mass communications today: Government restrictions, Forces affecting American mensorship, mechanical developments, interrelationship of the media and society; professional ethics.

## 22. Public Opinion Measurement (3) I

(Same course as Psychology 122)
The history, methods, and problems of public opinion and attitude measurement Emphasis will be placed upon the polling of consumers and voters. Students wil be given field experience.
124. Radio News Production (3) I, II

Prerequisite: Journalism 104 or Speech Arts 187
Radio news production with experience in writing, editing national wire copy and local copy, preparing tapes and on-the-spot recordings of news events fo programs produced over the campus radio station and local commercial radio stations. May be repeated to a maximum of six units
125. Television News Production (3) I, I

Prerequisite: Journalism 104 or Speech Arts 187
Television news production with experience in photographing news events, processing and editing film, and writing copy to film for programs produced over the campus and local commercial television stations. May be repeated to a maximum o six units.
144. Reporting of Public Affairs (3) II

Prerequisites: Journalism 51 A and 51 B
Coverage of the city hall, courthouse, police headquarters, federal agencies, courts, and other public and political centers.
150. Advanced News and Feature Photography (3) II

Two lectures and three hours of laboratory.
Prerequisite: Journalism 50.
Techniques for achieving the technical and story-telling quality in photojournalism.
151. News Editing (3)

Three lectures and two hours of laboratory.
Prerequisites: Journalism 51A and 51B.
Editing copy, writing headlines, making up pages, handling telegraph copy

## 152. High School Journalism (3)

Methods of conducting high school journalism classes. Editorial, business and mechanical aspects of school publication work, with emphasis on copy editing headline writing and layout. Not open to journalism majors

## 153. Newspaper Advertising (3) I

Principles of advertising for newspapers and trade papers. Emphasis on copy writing, layout, typography, and production. Use of consumer and market survey and advertising readership studies in planning local advertisers' sales problems an promotions.
154. Newspaper Advertising Practice (1-3) I, II

Prerequisite: Journalism 153.
Practical work in servicing accounts in advertising on campus media. Supervised work in preparation of copy and layout. Copy-testing methods emphasized. Maxi-
mum credit six units.

## 155. Advanced Editing Techniques (3) I

Prerequisite: Journalism 151.
Principles of typography, page layouts, and use of pictorial material; selection
evaluation, editing, and display of evaluation, editing, and display of news.

## 156. Advertising Campaigns (3)

Prerequisite: Journalism 153 or Telecommunications and Film 103.
Cases and problems dealing with advertising campaigns and decision-making involving copy themes, artwork, and media imagery.

## 157. Advertising Copy, Layout, and Production (3) I, il

Prerequisite: credit or concurrent enrollment in Journalism 153
Preparation of copy, layout planning, and production of advertising.

## 159. Advertising Research and Analysis (3) II

Prerequisite: Journalism 153.
Evaluation and use of data collecting and measurement for print media advertising. Cases and problems, with emphasis on quantitative and qualitative characteristics of print advertising.
162. Mass Communication and Society (3) I, II

Prerequisite: Sociology 1 or 102.
Social factors underlying nature, functions of mass media. Theories, models, research in media as culture carriers, as opinion shapers, and in relation to govern-
ment.

## 77. Research Methods in Mass Communications (3)

Prerequisite: Sociology 60.
Investigate tools and methods of mass media; content analysis, readership studies, audience measurement, experimental designs, and representative studies

## 179. Public Relations Techniques and Media Usage in Elections (3)

Use of public relations techniques in political campaigns sis on media usage.

## 180. Public Relations (3) I, II

Principles, methods, and objectives in the field of public relations; evaluation of the "publics" of institutions and industry; case studies of public relations problems.

## 182. Publications Workshop (3) 5

Individual problems in high school publication problems. May be repeated for a
maximum of six units.

## 183. Problems in Public Relations (3)

Prerequisite: Journalism 180.
tions.

## 184. Public Relations Practices (3)

Prerequisite: Journalism 180
Examination of current public relations practices in a wide variety of local com of the local community's public relations resources. and social organizations. Use
191. Infernship in Journalism (1-3) I, II

Prerequisites: Journalism $51 \mathrm{~A}, 51 \mathrm{~B}$, and consent of instructor.
Prearranged and supervised work on local magazines, city and county newspapers, adio and television stations, and on public relations, publicity, and advertising staffs of civic and business groups. May be repeated to a maximum of six units with no more than three units in any one semester.

## 92. Newspaper Production (1-3) I, II

Three hours of laboratory required for each unit. Total credit in Journalism 92, 93,192 , and 193 limited to eight units.
Special work in journalism by arrangement with the instructor. Includes reportng, editing, taking and processing pictures, working with the printer, proofreading ing, editing, taking and processing
193. Yearbook and Magazine Production (1-3) I,

Three hours of laboratory required for each unit. Total credit in Journalism 92, 3, 192, and 193 limited to eight units.
Special work in yearbook and magazine production by arrangement with the instructor. Includes editing and photographic work on Del Sudoeste and campus nagazines.
194. Editorial Conferences (1-3) I, II

More than three hours a week per unit of credit.
Prerequisites: Journalism 192 or 193, and consent of publication adviser.
Techniques for solving problems in publication production through individual The Daily Aztec and Del Sudoeste. Maximum credit six units.

## 97. Investigation and Report (3) I, II

Development of articles of substance and depth in specialized fields. Research analysis, and interpretation of complex issues in the news. May be repeated to a maximum of six units.
200. Scope and Method of Mass Communications (3) I
202. Seminar: Mass Media and the Law (3) I
217. Seminar: History of Journalism (3) II
218. Seminar in International Journalism (3)
221. Seminar: Media Problems (3) I
222. Mass Communications and Public Opinion (3) II
240. Major Projects in Mass Communications (1-6) I, II
262. Seminar: Mass Communications and Society (3) II
283. Seminar in Public Relations (3)
998. Special Study (1-3) I, II
299. Thesis (3) I, II

## Latin

See Classical and Oriental Languages.
Library Science

## Mathematics <br> In the College of Sciences

## Faculty

Emeritus: Clark, Emerson
Professors: Becker, G., Branstetter, Burton, Deaton, Drobnies, Eagle, Fountain, Lemme Moser Riggs, Harris, V., Harvey, A., Hasse, Holmes (Chairman), L., Willerding

Associate Professors: Bray, Bryant, Davis, R. W., Ho, Howard, E., Lopez,
Macky, Nower, Romano, Smith, J. B.
Assistant Profesors: Be, Smilh, J. B.
Kaskowitz, Khazanie, Kopp, R., Lesley, Marcus, Elwin, Hager, Hintzman, Ross, J., Self, Short, Villone, Whitman Lecturer: Bacon

## Offered by the Department

Master of Arts in mathematics.
Master of Science in mathematics.
Master of Science in statistics.
Master of Arts for teaching service with a concentration in mathematic
Major in mathematics with the A.B. degree in liberal arts and sciences.
Major in mathematics with the A.B. degree in applied arts and sciences.
Minor in mathematics.
Teaching major in
secondary teaching.
Teaching minor in mathematics with specialization in both elementary and
secondary teaching.

## Major

With the A.B. Degree in Liberal Arts and Sciences
Preparation for the major. Mathematics 50,51 , and 52 (13-16 units). Recom
mended: Physics 4A-4B-4C.
Major. A minimum of 24 upper division units which should be approved by the and 150 A , and may include six units of approved relast include Mathematics 121 A

## Major

With the A.B. Degree in Applied Arts and Sciences
Preparation for the maior. Mathematics 50 , 51 , and 52 (13-16 units). Recom-
mended: Physics $4 \mathrm{~A}-4 \mathrm{~B}-4 \mathrm{C}$.
Major. A minimum of 24 upper division units which should be approved by the and 150 A , and may include six units of work. This must include Mathematics 121 A

## Minor

The minor in mathematics consists of at least 21 units in mathematics include in the lower division, Mathematics 50 and 51 or Mathematics 21,22 , and in the upper division, nine units in 23, and in the upper division, nine units in mathematics with not more than three
units selected from Mathematics $101,104,110 \mathrm{~A}, 110 \mathrm{~B}, 130 \mathrm{~A}$.

## Major for the Standard Teaching Credential

## Specialization in Elementary Teaching

Preparation for the Major. Mathematics 21, 22, and 60; or 51 and 52 (8-9 units)
Teaching Major. Twenty-four upper division units in mathematics to include Mathematics 150 A or 152 . The remaining units must be approved by the departmental adviser and may include six units in courses from a related area.

## Specialization in Secondary Teaching

Preparation for the major. Mathematics 40 (unless exempted by examination) Preparation for the major. Mathematics 50 , 51 , and 52 . (13-16 units.) Recommended: Physics $4 \mathrm{~A}-4 \mathrm{~B}-4 \mathrm{C}$
Teaching Major (Undergraduafe). A minimum of 24 upper division units in mathematics to include Mathematics 101, 104, 150A, a geometry course and a statistics course. Mathematics 121 A is recommended.
Postgraduate Year. Six upper division or graduate units acceptable toward the credential, to be selected with approval of the departmental adviser.

## Minor for the Standard Teaching Credential <br> Specialization in Elementary Teaching

The minor in mathematics for elementary teaching consists of not less than 20 units in mathematics, six units of which must be in upper division courses.

## Specialization in Secondary Teaching

The minor in mathematics for secondary teaching consists of not less than 21 units, exclusive of course equivalents to include in the lower division, Mathematic 40 , or qualifying by examination, Mathematics 50 and 51 ; one course in related areas selected from Astronomy 1, Engineering 20A, Physics 4 A or 2 A or 1 A ; and in the upper division, nine units ( 12 units if major is a non-academic major) in mathematics to include Mathematics 104 and six units of mathematics electives.

## Mathematics Placement Examinations

All students who expect to enroll in Mathematics 3, 4, 12, 20, 21, 40, or 50 and have not completed prerequisite courses at San Diego State College must take the mathematics placement tests. Students in elementary education who expect to enroin Mathematics 10A, 10B, or 110A and Mathematics Education Placement Test These tests may be used to satisfy all or part of the prerequisite requirements for these courses and they also serve as a basis for the selection of students for the mathematics honors program. The schedule for these examinations will be posted on the mathematics bulletin board. Provision is also made for these examination to be taken by the entering freshman or the transfer student prior to registration Refer to the calendar.

## 3. Intermediate Algebra (3) I, II

Prerequisite: One year of elementary algebra.
Review of elementary algebra, exponents, radicals, logarithms, quadratic equations, Revmetic and geometric progressions. Not open to students with credit in Mathearithmetic and geometric progressions.

## 4. Trigonometry (2) I, II

Prerequisites: Credit in plane geometry in either high school or college combined with either credit in Mathematics 3 at this college or qualification on Mathematics Placement Examinatio
ematics 40 or 50.
Basic concepts of analytic trigonometry.
7. Introduction to Computer Programming (2) I, II

One lecture and three hours of laboratory.
Prerequisite: Mathematics 3.
The use of a problem-oriented language and peripheral equipment. Machine
organization. Extensive programming of problems on the computer.
8. Theory and Use of the Slide Rule (1)

Practice in performing the fundamental operations of the slide rule.
10A-10B. Structure and Concepts of Elementary Mathematics (3) I, II
Open only to students working toward a teaching credential in elementary
education. Preren.
fication on a Mathematics Ed algebra and geometry. Mathematics 10A or quali
Numbers used in elementary mathematics, Test is, prerequisite to 10B.
gruences, extension of the number system to elementary number theory and conmetric geometry, and an introduction to logic.
12. Elementary Statistics (3) I, II

Two lectures and two hours of laboratory.
Prerequisite: Mathematics 3 at this college or qualification on the Mathematics
Placement Examination. Tabular
analysis of times series, linear correlation coefficientral tendency and variability, of biology, economics, education, engineering and. Applications from the fields dents with credit for, or concurrent enrollment in psychology. Not open to stu-
18. Introduction to Mathematics (3) I, II

Prerequisites: Two years of high school mathematics.
Topics from logic, modern algebra, and analysis designed to give the student an introduction to the structure of mathematical theories and their applications. 20. Mathematics for Business Analysis (3) I, II

Prerequisite: Mathematics 3 at this college or qualification on Mathematics Place-
ment Examination.
and calculus.

## 21. Mathematical Analysis (3) I, II

Prerequisites: Mathematics 3 at this college or qualification on the Mathemat
Placement Examination acement Examination
Concepts and applications of algebra, analytic geometry and calculus, with emphasis on graphical methods. Designed for students polynomial engineering. Nare for a professional career in one of the physicnts who do no 22.

## 22. Mathematical Analysis (3) I, I

Prerequisite: Mathematics 21.
A continuation of Mathematics 21 including concepts of trigonometry and in Mathematics 51 .

## 23. Mathematical Analysis (3)

Prerequisite: Mathematics 22
Infinite series, partial differentiation, multiple integrals. For the non-major. (Not

## 37. Intermediate Computer Programming (3) I, It

Prerequisite: Mathematics 7.
Further use of problem-oriented language. Machine organization. Introduction to general concepts of machine and machine-oriented language. Additional intion
40. College Algebra (3) I, II

Prerequisite: Mathematics 3 at this college or qualification on the Mathematics Placement Examination.
Functional notation, mathematical induction, complex numbers, De Moivre's theorem, inequalities, binomial theorem, determinants, etc. Not open to students with credit in Mathematics 50 .

## 49. Introductory Matrix Algebra (3) <br> Prerequisite: Math 40.

Matrices, vectors, linear dependence and independence, basis, change of basis, similarity and congruence. Applications to systems of equations, characteristic values and orthogonality.

## 50. Analytic Geometry and Calculus (5) I, II

Prerequisites: Mathematics 40 at this college with grade of C or better, and credit or concurrent registration in Mathematics 4; or qualification on Mathematics Placement Examination.
Topics in analytic geometry, differentiation and integration of algebraic functions.

## 51. Differential and Integral Calculus (4) I, II

Prerequisite: Mathematics 50 with grade of C or better.
Differentiation and integration of the elementary transcendental functions; applications.
52. Differential and Infegral Calculus (4) I, II

Prerequisite: Mathematics 51 with grade of C or better.
Infinite series, partial differentiation, differential equations, multiple integrals, applications.
60. Introduction to Modern Mathematical Concepts (3) II

Prerequisite: Mathematics 40 or 21.
Elementary approach to selected topics from mathematical logic, set theory, probability, matrices, linear programing and theory of games.
100. Mathematical Topics for School Teachers (2 or 3)

Offered only in Extension to currently employed elementary and secondary school teachers.
A study of selected portions of elementary or secondary school mathematics. May be repeated with new subject matter for additional credit. May not be used in a mathematics major or minor.
101. Mathematical Concepts for Secondary School Teachers (3) I, II

Prerequisite: Mathematics 50.
An examination of the concepts of secondary school mathematics from the teacher's point of view.

## 104. History of Mathematics (3) 1 , II

Prerequisite: Mathematics 21 or 40 .
History of mathematics down to early modern times.
105. Introduction to the Foundations of Geometry (3) II

Prerequisite: Mathematics 51 or 22.
The foundations of Euclidean and hyperbolic geometries. Highly recommended for all prospective teachers of high school geometry.

## 106. Projective Geometry (3)

Prerequisites: Mathematics 51 or 22 and consent of instructor.
Concurrence of lines, collinearity of points and other properties of figures not altered by projections; construction and study of ellipses, hyperbolas, and parabolas by means of projections.
107. Non-Euclidean Geometry (3)

Prerequisite: Mathematics 22 or 51
History of attempts to prove the fifth postulate; emphasis on plane synthetic hyperbolic geometry; brief treatment of other types of non-Euclidean geometry.
108. Differential Geometry (3)

Prerequisite: Mathematics 52.
Curves in space, Frenet formulas, curves on surfaces, geodesics, lines of curvature, asymptotic lines, Gaussian curvature.
110A-110B. Modern Elementary Mathematics (3-3)
Prerequisite: Mathematics 10B or qualification on a Mathematics Education Placement Test. Mathematics 110 A is prerequisite to 110 B
Integers, rationals, and real numbers as mathematical systems; operations, mappings, properties of relations; coordinate geometry; mensuration. Enrollment limited to those in training for or engaged in teaching in the elementary schools.

118A-118B. Methods of Applied Mathematics (3) I, II
Prerequisites: Mathematics 52.118 A is prerequisite to 118 B
Selected topics from ordinary differential equations, with applications; hyperbolic, elliptic, Bessel and gamma functions, Fourier series and integrals, electromechanical analogies, the Laplace transform, and partial differential equations.
119. Differential Equations (3) I, II

Prerequisite: Mathematics 52.
Ordinary differential equations with applications to geometry, physics, and chemistry.

121A. Advanced Calculus I (3)
Prerequisite: Mathematics 52.
The real number system, limits and other topics, with emphasis on functions of one variable.

## 121B. Advanced Calculus II (3)

Prerequisite: Mathematics 121A.
A continuation of Mathematics 121A with emphasis on functions of two or more variables.
124. Vector Analysis (3)

Prerequisite: Mathematics 52.
Vector algebra, differentiation of vectors, gradient, divergence, and curl. Applications to geometry and physics.
130A. Statistical Methods (3) I
Two lectures and two hours of laboratory
Prerequisite: Mathematics 12 or equivalent statistics course.
F, $t$, Chi-square tests, analysis of variance, confidence intervals, correlation and regression analysis of covariance.

130B. Statistical Methods (3) II
Two lectures and two hours of laboratory
Prerequisite: Mathematics 130A.
Sequential analysis, sensitivity experiments, design of experiments, nonparametric and distribution-free statistics.

## 134. Probability (3)

Prerequisite: Mathematics 51.
Definitions, computation of probability by enumeration of the cases, discrete and continuous random variables, density functions, moments, limit theorems, selected distributions.

35A. Numerical Analysis and Comp
Prerequisite: Mathematics 7 and 52 .
Newton, Lagrange and Chebyshev approximation of
135B. Numerical Analysis and Computation (3) II
35B. Numerical Ansly 135 A
Prerequisites: Mathematics 119 or 118A and 135A. Solution of systems of linear equations. Application of numeric
solution of partial differential equations and of integral equations.

## 136. Date Structures (3)

Prerequisite: Mathematics 37 . Basic concepts of data. Linear lists, strings, array
sentation of trees and gripital Computers (3)
Prem Mathes 23 or 52.
Prerequal design, and applied combinatorial analysis.

## 139. Programming Languages (3)

Prerequisite: Mathematics 37.
Prerequisite: Mathematics 37. languages including specification of syntax Formal definition of programming languages inguages. List processing and string manipulation languages.

## 140A. Mathematical Statistics (3)

Prerequisite: Mathematics 134.
Prerequin distributions, law of large numbers, central limit theorem, estimation of Sampling distributions, law of la hypothesis testing, regression.

## 140B. Mathematical Statistics (3) II

Prerequisite: Mathematics 140A.
Theoretical discrete and continuous distributions, limiting distributions, small Theoretical discrete and student's T, Chi-square and F distributions with applicaample theory including studistribution-free statistics.

## . Statistics, Theory and Applications (3)

Prerequisite: Mathematics 140A
Sampling and sampling distributions, confidence limits, hypothesis testing, correlaion, regression, analysis of variance and covariance, nonparametric techniques.
43. Stochastic Processes (3)

Prerequisite: Mathematics 140A.
Weiner and Poisson processes, covariance stationary processes, renewal count processes, Markov chains.
149. Linear Algebra (3) I, II

Prerequisite: Mathematics 52 or 23 . A study of linear equation determinants, and eigenvalues.
150A-150B. Modern Algebra (3) I, II
Prequistes. Mathematics 22 and 60 , or $51 ; 150 \mathrm{~A}$ is a prerequisite to 150 B Seced the from modern algebra to include an introduction to the theory Selected topics from modern alge finite mathematics
152. Number Theory (3)

Prerequisites: Mathematics 22 and 60 , or 51 .
Prequen theory of numbers to include congruences, Diophantine Selected topics from the theory numbers.
155. Mathematical Logic (3)

Prerequisite: Mathematics 51 or 60 , or Philosophy 20.
The logical rules of erse universal and istential quantifiers with golications. Not open to students with credit in Philosophy 121.
156. Logical Foundations of Marhemarics (3)

Prerequisite: Mathematics 52 or 155.
The axiomatic method. Cantor's set theory and its antinomies. Development of the vious viewpoints on foundations of mathematics: logicism, intuitionalism, for malism.
57. Theory of Recursive Functions (3)

Prerequisite: Mathematics $150 \mathrm{~A}, 152$, or 155.
The recursion theorem, decision problems, reducibility results, Post's classificaion of effectively enumerable sets, separability, applications to logic and algebra.
158. Automata Theory (3) II

Prerequisite: Mathematics 150A.
Prerequisite: Mathematics 150A.
Definition and algebraic description of finite automata. Reduced forms for languages.
160. Introduction to Topology (3)

Prerequisite: Mathematics 121A
Topological spaces. Functions, mappings, and homeomorphisms. Connectivity, compactness. Metric spaces.
166. Honors Course (1-3) I, II

Refer to the Honors Program
170. Partial Differential Equations (3)

Prerequisite: Mathematics 119.
A study of initial and boundary value problems using separation of variables methodology.
175. Functions of a Complex Variable (3)

Prerequisite: Mathematics 52
Analytic functions, Cauchy-Riemann equations, theorem of Cauchy, Laurent series, calculus of residues.
196. Advanced Topics in Mathematics (1-3) I, II

Prerequisite: Consent of instructor.
Selected topics in classical and modern mathematics. May be repeated with the approval of the instructor for a total of six units.
198. Directed Readings in Mathematics Literature (1)

Prerequisite: Credit or concurrent enrollment in the upper division mathematics Prese in which readings are to be undertaken.
Individually directed readings in mathematics literature. May be repeated for Individually directed reaking each time from a different instructor.

## 200. Seminar (1-3)

202. Geometrical Systems (3)
203. Topics in Algebra (3)

204A-204B. Topies in Analysis (3-3)
205. Advanced Mathematical Logic (3)
212. Advanced Ordinary Differential Equations (3)
214. Advanced Partial Differential Equations (3)

Mathematics
220A-220B. Topology (3-3)
22A-222B. Functional Analysis (3-3)
224A-224B. Functions of a Complex Variable (3-3)
226A-226B. Functions of a Real Variable (3-3)
227. Fourier Analysis (3)
228. Generalized Functions (3)
230. Rings and Ideals (3)
231. Theory of Groups (3)
232. Theory of Fields (3)
233. Linear Algebra and Matrix Theory (3)

240A-240B. Advanced Mathematical Statistics (3-3)
241. Advanced Probability (3)
242. Non-parametric Statistics (3)
243. Advanced Hypothesis Testing (3)
244. Multivariate Analysis (3)
245. Linear Statistical Hypothesis Testing (3)
246. Statistical Decision Theory and Applications (3)
247. Design of Experiments (3)

260A-260B. Theory of Computability (3-3)
265A-265B. Formal Languages and Syntactic Analysis (3-3)
68A-268B. Applications of Digital Computation (3-3)
270A-270B. Advanced Numerical Analysis (3-3)
297. Research (1-3)
99. Special Study ( $1-3$ )
299. Thesis or Project (3)

Special Courses for National Science Foundation Institute
The following courses are open only to participants in the National Science The following courses are with consent of instructor.
54. Calculus Review (2)

Review of the fundamentals of elementary calculus.
180S. Recent Trends in Secondary School Mathematics (1)
Recent trends in high school mathematics and in application of mathematics.
181. Selected Topics of Secondary School Mathematics (3) Selected concepts of secondary school mathematics, recommended modern presentation of these concepts; relation these concepts to more advanced colege matics.
1835. Modern Algebra (3)

Topics of modern algebra with emphasis on their implications for high school Topics of modern algebra with emphasis on and altere important.
1855. Modern Geometry (3)

Topics of modern geometry with emphasis on their implications for high school nathematics. Postulational systems, Euclidean and Non-Euclidean geometrics, projective geometry, topology.
187A-187B. Probability and Statistics for Secondary School Teachers (3-3)
Pars tendency and dispersion, characteristics of freProbabily,

20A-20B. The Mexican-American Role in the American Political System (3-3)
Semester I: Relationship between the Mexican-American community and the Semester I: Relationstip Semester II: The Mexican-American in relation to his American political system. Semester in California. This year course meets the city, county, and state institutions in Institutions.
30. Mexican Literature in Translation (3)

Contemporary Mexican prose and poetry in translation.
40. History and Sociology of Racism (3)

Survey and analysis of majority group racism and its effects upon minority thnic groups and society.

41A-41B. History of the United States (3-3)
Emphasis on Spanish and Mexican influences. Semester I: U.S. expansion to Emphasis on Spanish and of Mexican immigration; farm labor and urban Chicano history; contemporary movements.
50. Introduction to Mexican-American Culture (3)
individual Chicano and his cultural pattern: The acquisition of his culture, Thovation and invention, direction of his cultural development, diffusion and interpenetration of Mexican and U.S. cultures.
60. Mexican-American Art (3) Southwest. Lectures and exhibitions by Chicano Contemporary ba

65A. History of Mexican-American Drama (3
The teatro Campesino of Luis Valdes: The Los Angeles teatro urbano. Theory and practice in contemporary Chicano theater, including literary, critical, and and practice ins consed against the historical background.
65B. Mexican-American Dramatic Production (3)
Two lectures and three hours of laboratory.
Theatrical practices and organization of productions; writing for the Chicano Theatrical practices and organization of presentation and the college.

65C. Mexican and Chicano Music (3)
Music of Mexico and the barrio: Emphasis on the corrido, its history and development in Mexico and the U.S.
00. Mexican-American Culture and Thought (3)

Intellectual history of Mexican-American from Nahua and European origins to Intellectual history of Mexican-American from Nahua atwentieth centuries. The concept of Raza de bronce and Aztlan.
101. Community Organization and Development (3)

The Mexican-American community for creative roles in Theory of organizing the Mexican-Amer the professional organizer.
102. Contemporary Problems of the Barrio (3)

Sociological and practical analysis of barrio problems. Observation in informal Sencies for experience and sensitizing.
103. Narcotics in the Mexican-American Community (3)

Prevention and cure of drug problems; old and new methods and formal and Prevention and explored.
104. Penology and Criminology and the Chicano (3)

The Chicano and the Pachuco and the penal institutions. Who goes to jail, and why. Field trips to penal institutions, courtrooms.

## Mexican-American Studies

105. Mexican-American Life Styles (3)

The Mexican-American family in the past, present, and future. Traditional and The Mexican-American fand the woman. The new alternatives in the twentieth century.
11. Advanced Field Instruction (3)

Advanced field work in the barrio. Directed research and development projects in the San Diego Chicano community. Maximum credit six units.
121. Immigration Law and Practices (3) from Mexico; process of immigration; Legal and political statu counseling the immigrant.
122A-122B. The Chicano in Urban Politics (3-3)
Prerequisite: Mexican-American Studies 122A is prerequisite to 122B.
Semester I: Theory of urban politics; study and observation in county, city, and community organizations and agencies. Identification of specific proble county, city II: Identification of specific urban problems; seloration of practical solutions.
and community organizations and (3)
131. Chicano Poetry: Creative Wrining (3) macaronic verse: A writing workshop Reading and writing of Spanish-English macricize each other's work. Poetry is in which students are given opportung. Maximum credit six units.

## 132. Chicano Prose: Creative Writing (3)

A writing workshop. Mutual criticism. Exploration of new form and conten
A writing workshop. Mese. Maximum credit six units.
133. Prehispanic Literature (3)

Literature of Nahua and Maya areas in translation: studied as literature.
34. Language of the Barrio (3)

Pachuco, calo, and barrio Spanish: A linguistic study.
135. Mexican-American Literature (3)

Ideas, forms,
165. Advanced Chicano Dramatic Production (3)

Two lectures and three hours of laboratory
Two lectures and the Chicano Theatrical practices and organization of productio and in college.
80. Thexican-American and the Schools (3)
180. Merem pre-school The Mexican-American compasis on social, intellectual, and emotional growth through high sevelopment.
181. Bilingual Systems (3) New methods in bilingual education. Practical materials.
182. Mexican-American Curricula Mexican-American curricula and their development.
183. Rural and Migrant Education (3

The Mexican-American rural and migrant student: problems and new programs.
184. Counseling the Mexican-American Student (3) (ing and involvement; recruit Motivational counseling at all levels; parent
185. Testing the Mexican-American Student (3)

Cultural bias in testing; development of new testing methods
186. The Educational System (3)

Study and observation in county, city, and community administrative and staff
 istrators and teachers.
97. Senior Survey in Mexican-American Studies (3)

Survey integrating studies of selected areas of Mexican-American studies. Senior eport will be written.

# Microbiology <br> In the College of Sciences 

## Faculty

Emeritus: Myers
rofessors: Baxter, W. (Chairman), Moore, H., Walch
Associate Professors: Kelly, Phelps
Assistant Professors: Anderes, Jokela, Steenbergen

## Offered by the Department

Master of Science in microbiology
Master of Arts or Master of Science degree in biology with an emphasis in microbiology.
Major in microbiology with the A.B. degree in liberal arts and sciences.
Major in microbiology with the B.S. degree in applied arts and sciences.
Major in Environmental Health with the B.S. degree in applied arts and sciences
Minor in microbiology.
Minor in microbiology. Teaching major in the biological major in one of the biological sciences.

## Microbiology Major

## With the A.B. Degree in Liberal Arts and Sciences

To satisfy the graduation requirement in foreign language, it is strongly recommended that students select French, German, or Russian.
Preparation for the major. Biology 1, 2, and 15; Chemistry 1A-1B, 4 or 5, and Chysics $1 \mathrm{~A}-1 \mathrm{~B}$ or $2 \mathrm{~A}-2 \mathrm{~B} \quad(37-41$ 11 or 12 . Mathematics 1 Chemistry 13; and Physics 3A-3B.
mimum of 24 upper division units in Microbiology and approved Major. A minimum of Microbiology 101, 103, 105 and 114 or Biology 155; and related fields, to include . Remaining units to be selected from courses in microbiology, Chemistry 115A-115B. Remaining units to be selected fromiry and physics.

## Microbiology Major

## With the B.S. Degree in Applied Arts and Sciences

Preparation for the major. Biology 1, 2, and 15; Chemistry 1A-1B, 4 or 5, and Preparation for the major. 40 ; and Physics $1 \mathrm{~A}-1 \mathrm{~B}$ or $2 \mathrm{~A}-2 \mathrm{~B}$. ( 34 or 36 units.) 11 or 12; Mathematics 21 or 3A-3B.
Maior A minimum of 36 upper division units in microbiology and approved
Major. A minimum of 36 upper divis, 102 or 115, 103, 104, 105, and 107; Chemelated fields to include Microbiology to be selected from courses in microbiology, istry 115A-115B. Remaining courses to be seectes, chemistry, and physics.
Public Health Microbiologist. To fulfill the academic requirements to qualify for
Public Health Microbiologist. To ful California State Department of Public Health he licensing examination gicrobiologist, the student should follow the major in microfor Public Health Microbiob. 109, and Zoology 128. Recommended Zoology 108 and 126.
, and Clinical Technologist. To fuin the State for Clinical Technologist, the student licensing examination follow the major in microbiology described for the B.S. degree, but should should (include Microbiology 102 and 109, and Zoology 128, and should substitute Chemistry $114 \mathrm{~A}-114 \mathrm{~B}$ for Chemistry 11B, 114 or Biology 155; and Zoology 108 and 126. 151. Microbiology 108, 111A-111B, 114 or Biology 155; and Zoology 108 and 126.

## Environmental Health Major

With the B.S. Degree in Applied Arts and Sciences
Preparation for the major. Biology 1 and 2; Chemistry 1A-1B, 4 or 5, and 11 or 12 ; Physics $1 \mathrm{~A}-1 \mathrm{~B}$ or $2 \mathrm{~A}-2 \mathrm{~B}, 3 \mathrm{~A}-3 \mathrm{~B} ;$, Mathematics 21 and 22 , or 40 and 50 ; Biology 15; Geology 2; Health Science and Safety 65; and Sociology 1. (48-54 units.) Major. A minimum of 36 units to include Microbiology 101, 102, 11iA-111B, 112 , 113; Zoology 128 or Biology 150;
tion 160; Engineering 123, 125 .

## Microbiology Minor

The minor consists of 15 units in microbiology to include Microbiology 101, 103 and 105.

## Biological Sciences Major

## For the Standard Teaching Credential

The teaching major for secondary teaching requires an undergraduate major in one of the biological sciences: biology, botany, microbiology, or zoology. Al elective courses in the major must have prior approval by the adviser sciences teaching programs.

Postgraduate Year, A minimum of six units from courses acceptable for graduate credit on a master's degree program in the biological sciences. Courses must hav pproval of the adviser for

## 1. General Microbiology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Chemistry 1A or 2A. Students with credit in Microbiology 110 may enroll but will receive only one additional unit of credit.
A course for other than biological science majors. A study of the microorgaisms of the environment, including the disease-producing organisms, their actions and reactions.
101. General Microbiology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Chemistry 1A-1B. Students with credit in Microbiology 110 may proll but will receive only one additional unit of credit.
The actions and reactions of microorganisms in response to their environment, The actions and reactions or y other organisms, including man. Also includes an introduction to the pathogens.

## 102. Pathogenic Bacteriology (4) I, II

Two lectures and six hours of laboratory. 4 or 5, and 11 or 12 . Recommended: Prerequisites: Microbio
Bacterial and rickettsial agents of disease in man and other animals. Consideration factert-parasite relationships, the biology of the inciting agents and mechanisms of of host-parasite relationships, the bience in isolation and identification of bacterial pathogens.
103. Fundamentals of Immunology and Serology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Microbiology 101, and one other advanced Microbiology course ard Chemistry 114A or 115A.
The immunochemistry of antigens and antibodies and their reactions. Immunohematology and hypersensitivity. Serological techniques
104. Medical Mycology (4) I,

Two lectures and six hours of laboratory.
Prerequisites: Microbiology 101, Chemistry 11 or 12. Recommended: Chemistry 114 A or 115 A .
114A or 115A.
Mycotic agents of disease in human and other animals. Consideration of the Mycotic agents of disease in human and other animals, including factors affecting virulence and immunity. Experience in systematic identification.
105. Microbial Physiology (4) I, II

Two lectures and six hours of laboratory
Two lectures and 101 . Chemistry 4 or 5 and 11 or 12; and Physics Prerequisites: Microbiology 101; Che or 115A; Physics 3A-3B
Physiology of selected bacteria, fungi, and other microorganisms.

## 107. General Virology (2) I,

Two lectures.
Prerequisite: Microbiology 102 or 115
Viruses, their structure, function, culture, and methods of study.
108. General Virology Laboratory (2) I

Six hours of laboratory.
Prerequisites: Microbiology 102 and credit or concurrent registration in Micropiology 107.
The culture, isolation, and characterization of viruses.
109. Mematology (4) I, II

One lecture and six hours of laboratory.
Prerequisites: Microbiology 101 and Chemistry 11 or 12.
The study of normal and pathological blood with chemical, physical and microscopic methods.

## 0. Mierobiology and Man (3) I, II

Two lectures and three hours of laboratory.
The biology of microorganisms and their significance in disease, agriculture, saniThen and industry; laboratory exercises designed to complement lecture material. Not open to majors in the biological sciences.

## 111A-111B. Epidemiology (2-2)

## Two lectures.

Prerequisite: Microbiology 102.
Study of the transmission, distribution, and control of infectious and non-infectious diseases in the community.
112. Survey of Environmental Health (4) I

Three lectures and three hours of laboratory and field work.
Prerequisites: Biology 15; Chemistry 1A-1B, 4 or 5, and 11 or 12; Physics 2APrerequisites. Bology 2; Health Science and Safety 65; and Microbiology 101.
General principles of environmental sanitation, including the relationship of the General aspects of physical environment to preventive medicine; the provision of various aspects water, proper waste disposal, safe food supply, and adequate habitation.

## Weath Administration (4) II

113. Environmental Heaith Administration field work

Three lectures and three hours of health Science and Safety 160, and credit or Prerequisites: Microbiology Engineering 125.
concurrent registration enth Concepts of organization and ad, national and international levels.
114. Bacterial and Viral Genetics (4) I

Two lectures and six hours of laboratory.
Prerequisites: Microbiology 101, Chemistry 11 or 12. Recommended: Chemistry
114 A or 115 A
The genetics of bacteriophages, selected animal viruses and bacteria.
115. Advanced General Microbiology (4) II

Two lectures and six hours of laboratory.
Prerequisites: Microbiology 101; Chemistry 114B or 115B; and either Microbiology 105, Biology 101, or Botany 130
Taxonomy, comparative physiology and ecology of representative microorganisms found in various natural environments.
116. Marine Microbiology (4) I

Two lectures and six hours of laboratory.
Prerequisites: Microbiology 101, and Biology 110 or Microbiology 115.
Prerequisites: Microbiology 101, and Biology cean waters; interrelationships with Microbiological population of estuary and ocean waters,
118. Community Epidemiology (3) I, II

Prerequisite: Microbiology 1.
A course for other than biological sciences majors. Epidemiological concepts and methods as they apply to current community problems.
120. Animal Viruses (4) II

Two lectures and six hours of laboratory.
Prerequisites: Microbiology 107. Recommended: Microbiology 103 and 108.
Animal virus identification and investigation, emphasizing cell culture, cytopathic effects, and serology.
130. Experimental Immunology (4) II

Two lectures and six hours of laboratory.
Prerequisites: Microbiology 103, Chemistry 114A or 115A.
The study of selected antigens and antibodies and their reactions.

## 140. History of Microbiology (2) I,

Prerequisite: Microbiology 101
The development of microbiology as a specialty area of the biological sciences the developmen on social and political developments.

## 180. Electron Microscopy (4) it

Two lectures and six hours of laboratory.
Prerequisites: Physics 2A-2B, Chemistry 11 or 12, Microbiology 101. Recom mended: Biology 103, Microbiology 107, and Zoology 108.
Principles and techniques in the biological application of the electron microscope.
190. Investigation and Report in Microbiology (2) $\mathbf{I}$, II

Prerequisites: Microbiology 101 and at least one additional upper division course in microbiology.

Investigation and reports on current microbiological literature
198. Methods of Investigation (2) $\mathbf{I}, \mathbf{I I}$

One discussion and three hours of laboratory
Prerequisites: Microbiology 101 and one other upper division course in the biological sciences.
Selection and design of individual investigation in microbiology; oral and written Selection and design of ind credit for Microbiology 198 or a combination of this reports. Four units maximum
course with Biology 198 or Zoology 198

## 200. Seminar (2 or 3)

205. Seminar in Microbial Physiology (2)

Microbiology
210. Seminar in Pathogenic Bacteriology (2)
215. Seminar in Bacterial and Viral Genetics (2)
220. Seminar in Industrial and Agricultural Microbiology (2)
230. Seminar in Medical Mycology (2)
240. Seminar in General Microbiology (2)
245. Seminar in Aquatic Microbiology (2)
250. Seminar in Virology (2)
60. Seminar in Immunology and Serology (2)
270. Biology of Animal Pathogenic Fungi (4)
271. Bacterial Viruses (Bacteriophages) (4)
272. Advanced Pathogenic Bacteriology (4)
290. Bibliography (1)
291. Research Techniques (3)
297. Research (1-3)
298. Special Study (1-3)
299. Thesis or Project (3)

In the College of Professional Studies
The Department of Music is a member of the National Association of Schools of Music.

## Faculty

Emeritus: Smith, L. D., Springston
Professors: Anderson, P. V., Biggs, Blyth, Genzlinger, Hogg, Hurd, Lambert Professors: Anth, J. D. (Chairman), Snider, Ward-Steinman
Associate Professors: Bruderer, Brunson, Estes, Forman, Mracek, Sheldon
Assistant Professors: Almond, Ernst, Flye, Hill, H., Logan, Loomis, Mitchell, Moe, J., Rohfleisch, M., Yates
Lecturer: Overton

## Offered by the Department

Master of Arts in music.
Major in music with the A.B. in liberal arts and sciences
apor and sciences.
Minor in music.
Teaching major in music with specialization in secondary teaching
 sciences, with a concentration in music. See Education.

## Teaching Minor in Music with Specialization in

## Elementary and Secondary Teaching

The music curricula are designed to fulfill the needs of all students: (1) those who have professional ambitions in music performance, or seek a foundation for graduate study leading to college or university teaching, (2) those who are preparing for one of the several state teaching credentials with music as either a major or minor, (3) those whose major professional interest is in anothor deparin music as are seeking musical study as a minor, and (4) those who are intereground.

## General Basic Requirements

General basic requirements for the B.M. degree in applied arts and sciences, Gen. degree with a major in music in liberal arts and sciences or in teacher the A.B. degree follows:

1. Upon entering the department, each student is required to take an examination . Upo mesters of class piano study for credit.
2. Upon entering the department, each student is required to declare his major instrument ( through continuous study for credit after admission to the program.
3. Apearance in least one student recital during each semester in residence, a. Appe to departmental recital requirements.
4. As lary experience, participation in two performing groups each semes4. As laboratory experst semester and continuing for eight semesters for stuter, beginning wajor in applied arts and sciences, or for seven semesters for students in the teaching credential program, one of which must be a major group (choir piano ensemble, orchestra, or band) in which the major instrument or voice regularly used.

## Major

With the A.B. Degree in Liberal Arts and Sciences
Students should choose French, German or Italian to meet the foreign language requirement for graduation

Preparation for the major. Music 9A, 9B, 10A-10B-10C, $59 \mathrm{~A}, 59 \mathrm{~B}$ or 106,52 , and four units of Music 50. (21 units.) Major. A minimum of 24 upper division 4 D -154E, four units selected from 170 through 188 , six units of upper division electives.

## With the B.M. Degree in Applied Arts and Sciences

maior. Music 9A-9B, 10ABCD (may be waived in full or in Preparation for the major. Music 9 A , 88 , and four units in the major instrument. ( $26-30$ units.)
Maior This units to include Music 108, 109A, 146A, Major. Thirty-two to 34 upper 15 B , 152 A . 152 B ; eight units seled courses numbered 170-188; four units $146 \mathrm{~B}, 152 \mathrm{~A}, 152 \mathrm{~B}$; eight units selected from of courses in the major instrument; Music 106; and the requirements in one of the of courses in the major instr
(a) Performance. Five units from Music 153, 154ABCDE, 167, 197, 199.

Students emphasizing performance must appear in a joint recital during the junyear and must present a solo recital during the senior year. The student must pass an audition of the compositions to be performed before the music faculty preceding the recitals.
(b) Music History and Literature. Seven units from Music 154ABCDE, 197, 199. During his senior year, the student emphasizing music history and literature is Duired to organize, prepare program notes, and present two recitals consisting of recorded or "live" performances. Each will deal with representative works of a certain period or composer or with certain periods, composers, or styles to be compared. Such students must pass a preliminary audition of the material to be presented before the music faculty at least one month in advance of each performance.
(c) Composition. Seven units from Music 105, 109B, 197, 199. admission to this An interview with the Department Chairman is required for admission to the emphasis. Students electing the emphasis will take ind ine spring term of the junior year freshman and sophomore years and
in lieu of private study in composition. and composition is required to The student emphasizing creative activity and comer year and present the scores present a concert of horks to be performed to the music faculty one month in advance of the of worms

Foreign Language Requirement. Twelve units in one foreign language chosen俍 of reading knowledge administered by the foreignt. (Exception: Voice students must subin consultation with the Musich, German, and Italian, or the equivalent, in lieu of 12 units in one foreign language.)

Outline of Specific Requirements


May be waived in part or in full by examination.


$\ddagger$ In addition to the upper division courses in the major, the student must have a sufficient number of upper division units to meet the minimum of 40 required for the A.B. degree.

## Minor

The general basic requirements for the minor in music are as follows:
(1) Demonstration of vocal or instrumental performing ability before admission

1) Demonstration of vocal or instrumed.
to the minor program may be granted.
(2) Proficiency in piano equivalent to Music 10ABCD.

Coursework in the minor consists of 21 units in music to include the following: In the lower division, Music 9A, 9B, 52, and 59A; in the upper division, Music 151,

## Major for the Standard Teaching Credential

Students in teacher education may use this major, with specialization in secondStudents in teacher education may use ary teaching, for the A.B. degree in recital attendance and performance, and proficiency examinations in voice and piano.
Preparation for the major. Music 9A, 9B, $59 \mathrm{~A}, 59 \mathrm{~B} ; 10-\mathrm{A}-\mathrm{B}-\mathrm{C}-\mathrm{D}, 15 \mathrm{~A}, 15 \mathrm{~B}, 52$; ight units selected from courses numbered 70 through 88 ; four units selected from courses numbered 20 through 35 ; and four units in the major instrument. ( 36 units.) Teaching Major (Undergraduate). Thirty units to include Music 108, 109A; three units selected from courses numbered 120 through 135; Music 146A, 146B, 152A, 152 B ; six units selected from courses numbered 170 through 188; three units in the major ins
or 121 S .

Proficiency Examination. In addition to the major, the credential candidate Prst pass a departmental proficiency examination in piano and voice, to include must pass a de
the following:
(a) Piano: Specific requirements may be obtained in the Music Department (a)
Office.
(b) Voice: Ability (1) to sing at least one song representative of each of the (b) Voice: Ability (1) to sing at least one song representative of each of the
following periods of vocal literature: classic, romantic, modern; (2) to sing at following perios of sight any part of a four-part hymn.
Postgraduate Year. Confer with departmental adviser.

## Music

## Minor for the Standard Teaching Credential <br> Specialization in Elementary Teaching

The teaching minor in music for elementary teaching is restricted to students admitted to and continuing in the credential program for elementary teachers. The mitted to and continuing in the credental
teaching minor consists of not less than 20 units to include the following courses: teaching minor consists of not less than tion courses numbered $170-188$.

## Specialization in Secondary Teaching

The teaching minor in music for secondary teaching requires demonstration of The teaching mental performing ability by placement audition before admission to ocal minor program may be granted.
Coursework in the minor consists of 25 units to include the following: In the wer division, Music $9 \mathrm{~A}-9 \mathrm{~B}, 10 \mathrm{~A}-10 \mathrm{~B}-10 \mathrm{C}, 15 \mathrm{~A}-15 \mathrm{~B}$, and 52 ; in the upper division, Music $146 \mathrm{~A}-146 \mathrm{~B}$, four units in the major instrument, three units of music organiation courses $170-188$, and $3-6$ units selected from Music 120A, $120 \mathrm{~B}, 125 \mathrm{~A}, 125 \mathrm{~B}$, A 130A, 130 B , and waived to be used in courses 120A through 135 .

## Electives in Music

The Music Department offers certain courses for students who are interested in The Music Deparmente area for the enrichment of their cultural background. music as an electavly suited for these needs are Music 51 and 151 and the music courses numbered 70 to 88 and from 170 to 188. Somel inded in this group. Enrollprepared to elect courses which may to elect these courses is encouraged.
ment by qualified students

## Applied Music Study for Credit

Credit may be allowed for applied music study under the following conditions: 1. Properly enrolled music majors may study applied music with resident faculty without an additional fee.
Properly enrolled music majors who elect to study off campus with a teacher 2. Properly enrolled the Department of Music may do so and may apply for credit approved by Aeplication for such credit must be made each semester in the by examinatio. Appication or such cfredir time limits for filing a change of Ofice of the Registrar win will consist of the regular jury examination reprogram. The examinaiors at the conclusion of each semester.
quired of all masic
3. Students may under no circumstances change teachersirman of the Departsemester withou
ment of Music.
Prior to the start of applied study at San Diego State, the student is required
4. Prior to the start of applidition conducted by Department of Music faculty to take a preliminary audition conderceding of his study.
. Sur wat or school or have stopped taking applied
5. Students who have dropped semester or more, upon resumption of that instrucmusic for credit for one semester or more, upor celiminary audition.
tion for credit are requirester, the Department of Music will sponsor a jury
6. At the end of each semester, the Depandards have been met.

## aric Musicianship for Non-Music Majors (3) I, il

Four hours.
Rudimentary music theory involving the elements of music: melody, rhythm, Rudimentary. Developing the understanding of these elements through instrumental and vocal experiences which include the use of unison ard and simple melodic and harmonic instruments.
7. Composition Laboratory (1) il

Three hours of laboratory
Prerequisite: Consent of instructor.
Original writing in different homophonic and polyphonic forms for various media. May be repeated to a maximum of two units.
8A-8B. Comprehensive Musicianship (6-6) I, II
Four lectures and four hours of activity
Prerequisite: Music 8 A is prerequisite to 8 B .
Direct analysis of musical forms as they have evolved historically; sight-singing,
Dheard harmony, dictation, part-writing and counterpoint and, where relevant, keyboard harm, aesthetics, art and architecture, literature, and cultural history.

## 9A. Elementary Harmony (3) I, II

Four hours.
Sight-singing, dictation, keyboard harmony; traditional diatonic harmony, partwriting, analysis.

## 9B. Intermediate Harmony (3) I, II

Four hours.
Prerequisite: Music 9A
Continuation of Music 9A, with applied emphasis upon part-writing.

## 10A-10B. Piano-Elementary Class Instruction (1-1) I, II

Two hours.
Prerequisite: Music 10 A is prerequisite to 10 B .
Basic keyboard experience through study of music reading, notation, scales, chords, and sight-reading covering a repertoire of beginning and intermediate song and piano literature, with emphasis on keyboard harmony. Required of music majors and minors and credential candidates for teaching at the kindergarten primary level.
10C-10D. Piano-Elementary Class Instruction (1-1) I, II
Two hours.
Prerequisite: Music 10 B is prerequisite to 10 C ; and 10 C to 10 D .
Continuation of Music 10A-10B.
15A. Voice-Elementary Class Instruction (1) I, II
Two hours.
A class for beginners in the vocal field taking up the problems of breath control A class for simple songs.

15B. Voice-Elementary Class Instruction (1) I, II
Two hours.
Prerequisite: Music 15A.
More advanced songs with attention being given to interpretation, as well as More advork on tone, articulation and placement. Frequent performance before class required.

## OA. Strings-Elementary Class Instruction (1) I

Two hours.
Fundamentals of violin, viola, cello, and string bass by lecture and acquisition of elementary skills. Not open to students with credit in Music 120A.

## OB. Strings-Elementary Class Instruction (1) II

Two hours.
Prerequisite: Music 20A or 120A
Fundamentals of violin, viola, cello, and string bass by lecture and acquisition of lementary skills emphasizing those instruments not previously studied in Music 20 A or 120 A . Not open to students with credit in Music 120B

25A. Clarinet and Flute-Elementary Class Instruction (1) 1, II
Two hours.
Fundamentals of the clarinet and flute by lecture and acquisition of elementary kills. Not open to students with credit in Music 125A.

## 20. Ohoe and Bassoon-Elementary Class Instruction (1) I, II

Two hours.
Fundamentals of oboe and bassoon by lecture and acquisition of elementary skills. Ft men to students with credit in Music 125B.
30A. Brass-Elementary Class Instruction (1) I
Two hours. Fundamentals of the trumpet and French horn by lecture and
ementary skills. Not open to students wiass Instruction (1)

## Two hours

Prequisite: Music 30A or 130A
Prequentals of the bass clef instruments (trombone, baritone, and tuba), by Fundamentals of the bass clef instruments Not open to students with credit in lecture and
Music 130B.

Class Instruction (1) 1,
Two hours.
Fundamentals of percussion through acquisition of elementary skill on the snare nstration and lecture regarding all commonly used percussion drum and Music 135.
50. Applied Music-Individual Study (1) I, II

Fifteen one-half hour private lessons or two one-hour group sessions. Studies in technical, stylistic, and aesthetic elements of artistic performance. Fo Studies in techer which credit may be given, see Applied Music Study for Cred conditions under whichusic major. Maximum credit for each instrument four units.
A. Piano
B. Organ
C. Voice
D. Flute
E. Oboe
F. Clarinet
H. Bassoon
J. French Horn
N. Tuba
. Trumpet
O. Percussion
P. Violin
Q. Viola
R. Cello

Contrabass
U. Classical Guita
V. Composition
X. Classical Accordion
Y. Harpsichord
music with understanding and pleasure, through Practical approach to hearing music with undes styles and performance media, study of representative compositions of various styles and performagh lectures, great musicians and their art. Music correlated minors.
recordings, concerts. Closed to music major
52. Orientation in Music The elements of musical style, structure, ant and assigned study of phonograph representative musical scores.

## 3. Opere Technique (2) I, it

## 53. Opera

our hours. The interpret of operatic ensemble.

58A-58B. Comprehensive Musicianship (6-6) I, II
Four lectures and four hours of activity.
Prerequisite: Music 8 B ; Music 58 A is prerequisite to 58 B .
Continuation of Music 8A and 8B.

## 59A. Advanced Harmony (3) I, II

Four hours.
Prerequisite: Music 9B.
Continuation of Music 9B. Chromatic harmony, remote modulation, introduction to twentieth century techniques; analysis and writing.
59B. Eighteenth Century Counterpoint (3) I, II
Four hours.
Prerequisite: Music 59A.
Two- and three-voice counterpoint in the eighteenth century manner; compositional exercise in appropriate forms.

## Performance Organization Courses

The performance organization courses are devoted to the study in detail and the public performance of a wide range of representative literature for each type of nsemble and designed to provide students with practical experience in rehearsal echniques.

## 70. Chamber Music (1) I, II

Three hours.
Prerequisite: Consent of instructor
Prerequisite: Consent of instructor. Sections for string, wood
Maximum credit four units.

## 75. Marching Band (1)

Concurrent registration in Music 75 and 76 required. Combined activity, six hours.
Prerequisite: Consent of instructor.
Maximum credit two units.
76. Symphonic Band (1) I, II

Semester I: Concurrent registration in Music 75 and 76 required. Combined activity, six hours.
Semester II: Activity, five hours.
Prerequisite: Consent of instructor.
Maximum credit four units.

## 80. Symphony Orchestra (1) I, II

Five hours.
Prerequisite: Consent of instructor.
Maximum credit four units.

## 85. Concert Choir (1) I, II

Five hours.
Prerequisite: Consent of instructor.
Maximum credit four units.

## 86. Treble Clef (1) I, II

Three hours.
Maximum credit four units.
87. Men's Glee Club (1) I, II

Three hours.
Maximum credit four units.
88. College Chorus (1) I, II

Three hours.
Open to all persons interested in performing oratorio, cantata, opera, and the op. units.
39. Jarz Ensemble (1) 1, II

Three hours.
Prerequisite: Consent of instructor
Maximum credit four units.
90. Collegium Musicum (1) $\mathbf{I}$, II

Prerequisite: Consent of instructor
Maximum credit four units.
105. Modern Harmonic Practice (3) I, II

Prerequisite: Music 59A.
Analysis and composition in modern idioms.
106. Sixteenth Century Counterpoint (3) I, II

Prerequisite: Music 59A.
Contrapuntal techniques of the sixteenth century, as revealed in the works of Contrap Mass and in writing motets.
107. Composition Laboratory (1) II

Three hours of laboratory
Prerequisites: Music 7 and consent of instructor.
Continuation of Music 7. Maximum credit two units,

## 108. Form and Analysis (2) I,

Prerequisite: Music 59A.
Musical structure and design from traditional and modern literature; development of detailed analytical techniques.

09A-109B. Instrumentation and Arranging (2-2) I, 1
Prerequisite: Music 59A. Music 109A is prerequisite to 109 B . Arranging of music

## 20A. Strings-Elementary Class Instruction (1)

Two hours.
Fundamentals of violin, viola, cello, and string bass by lecture and acquisition of Fundamentals of Not open to students with credit in Music 20A.
1208. Strings-Elementary Class Instruction (1) II

Two hours.
Prerequisite: Music 20A or 120A.
Prerequisite: Music 20A or 120A. Fundamentals of violin, viola, cello, and string base instruments not previously studied in Music elementary skills emphasizing those instruments not previ
23. Techniques and Chamber Music for String,

123-5. Workshop in Instrumental Techniques and Chamer Woodwind, and brass instrum.
Prerequisite: Consent of literature for each instrument, with per The analysis and interpretation of the literature for each instrument, with ind class, formance in various ensemble units; both

125A. Clarinet and Flute-Elementary Class Instruction (1) I, 1
Two hours.
Fundamentals of the clarinet and flute by lecture and acquisition of elementary skills. Not open to students with credit in Music 25A.

## 125B. Oboe and Bassoon-Elementary Class Instruction (1) I, II

Two hours.
Fundamentals of oboe and bassoon by lecture and acquisition of elementary skills. Not open to students with credit in Music 25B.

## 130A. Brass-Elementary Class Instruction (1) I

Two hours.
Fundamentals of the trumpet and French horn by lecture and acquisition of elementary skills. Not open to students with credit in Music 30A

## 1308. Brass-Elementary Class instruction (1)

Two hours.
Prerequisite: Music 30A or 130A
Fundamentals of the bass clef instruments (trombone, baritone, and tuba), by Fundamentals acquisition of elementary skills. Not open to students with credit in Music 30B.

## 135. Percussion-Elementary Class Instruction (1) 1, II

Two hours.
Fundamentals of percussion through acquisition of elementary skill on the snare rum and by demonstration and lecture regarding all commonly used percussion instruments of definite and indefinite pitch. Not open to students with credit in Music 35.

## 140. Marching Band Shows (2)

## Two hours.

Prerequisite: Two semesters of Music 75 or 175
The organizing, charting, and producing of half-time shows for football games or prospective high school teachers. Shows are planned and produced by the students and performed by the Marching Band.

## 141. Applied Music Pedagogy (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: Consent of instructor.
Teaching beginning and intermediate applied music. Survey and evaluation of arhing materials. Observation of individual or group lessons.
A. Piano
B. Strings
142. Applied Music Pedagogy Laboratory (2) I, II

One lecture and three hours of laboratory.
Prerequisite: Music 141A is prerequisite to 142 A and 141 B is prerequisite to 142 B . Practical experience in the teaching of individual or group lessons.
A. Piano
B. Strings

## 43. Music Literature for Elementary Teachers (3) I, II

Prerequisites: Music 2 or 9A.
Music literature suitable for teaching at the elementary school level; includes ackground information and ways of classroom presentation

## 144. Music of the People (3) I, II

Prerequisite: Music 2 or 9A.
The origin and development of folk music; the social instruments and their use Participation in singing and playing folk music.
145. Music in Contemporary Life (3) $\mathbf{1}$, $\mathbf{I}$

Prerequisite: Music 2 or 9 A . Functional music in society to incosposer, the musician, and the audience.

## 146A. Choral Conducting (1) I,

Three hours.
Prerequisite: Junior standing.
Rlone development of basic skills common to choral Elements of baton technique and development of basic shor choral organizations wil conducting. Representative literature experience in typical conducting situations wil be studied and performes grade levels.

## 46B. Instrumental Conducting (1) It

Three hours.
Prerequisite: Music 146A
Prerequisite: Music 146A. Orchestra and band instrumental works in public performances.

## 47. Perspectives in Music (3) I, II

Prerequisite: Music 2 or 9 A .
rerel Musical understandings fom the visual arts and the humanities.
(150. Music-Individual study (1) I, II
pessons or two one-hour group sessions
Fifteen one-half hour private lessons Studies in technical, stylistic, and aesthetic elements of artistic performance. For conditions under which credit may be given, see Applied Music instrument four units.
A. Piano
A. Piano
B. Organ
B. Vrgan
D. Flute
E. Oboe
F. Clarinet
G. Saxophon
H. Bassoon
]. French Hor
K. Trumpet
M. Baritone Hor
N. Tuba
O. Percussion
Q. Viola
R. Cello
S. Contrabass
T. Harp.
U. Classical Guitar
V. Composition
X. Classical Accordion
Y. Harpsichor
151. Great Music (3) I, II
s historical periods with emphasis on Significant music literature of the various listening
the stylistic characteristics through directed 19th Centuries
A. Musical Masterpieces of the 18 th Century
B. Musical Masterpieces of Opera.
. Masterpieth Century American Jazz

## 52A-152B. History of Music (3-3) I, II

Prerequisites: Music 52 and 59 A ; Music 152A is prerequisite to 152 B .
The chronological development of musical art and forms from the Middle Ages
The chronological developme study and assigned recordings, Familiarity with o the present. Analytical sough individual assignments.

## 153. Opera Technique (2) I, II

Four hours.
our characterization of light and grand opera. Specific work in coordination of opera ensemble.
154. Music Literature (2) I, II

Prerequisites: Music 52 and 59A.
A concentrated study of the literature in the several areas listed. Analysis by use of scores and of recordings, when available.
A. Chamber Music Literature-Strings
B. Small Wind and Percussion Ensemble Literature
C. Symphonic Literature
D. Keyboard Literature
E. Song Literature
167. Junior Recital (1) I, II

Prerequisite: Junior standing in music.
Selection of literature for recital program not to exceed thirty minutes in length; Seoretical analysis and historical study of scores chosen; preparation for public performance; and examination before committee of music department faculty.
197. Senior Recital (2) I, II

Prerequisite: Senior standing in music.
Selection of literature for recital program not to exceed one hour in length; heoretical analysis and historical study of scores chosen; preparation for public performance; and examination before committee of music department faculty.

## Performance Organization Courses

The performance group courses are devoted to the study in detail and the pubic performance of a wide range of representative literature for each type of ensemble and designed to provide students with practical experience in rehearsal techniques.

## 170. Chamber Music (1) I, I

Three hours.
Prerequisite: Consent of instructor.
Sections for string, woodwind, brass, piano, vocal, and mixed ensemble groups. Maximum credit four units.

## 175. Marching Band (1) I

Concurrent registration in Music 175 and 176 required. Combined activity, six hours.
Prerequisite: Consent of instructor.
Maximum credit two units.
176. Symphonic Band (1) 1, II

Semester I: Concurrent registration in 175 and 176 required. Combined activity, six hours.
Semester II: Five hours per week.
Prerequisite: Consent of instructor.
Maximum credit four units.
180. Symphony Orchestra (1) I, II

Five hours.
Prerequisite: Consent of instructor
Maximum credit four units.

## 185. Concert Choir (1) I, II

Five hours.
Prerequisite: Consent of instructor
Maximum credit four units.
186. Treble Clef (1) I, II

Three hours.
Maximum credit four units.
187. Men's Glee Club (1) I, II

Three hours.
Maximum credit four units

## 188. College Chorus (1) I, II

Three hours.
Then and performing oratorio, cantata, opera, and the Open to all persons interested in performing oratorio, cance Maximum credit four units.
189. Jaxz Ensemble (1) 1,

Three hours.
Prerequisite: Consent of instructor.
Maximum credit four units.

## 190. Collegium Musicum (1) I, II

Three hours.
Prerequisite: Consent of instructor.
Maximum credit four units.
200. Seminar in Music Education (3) I, II
A. Development and Teaching of Strings
B. Choral and Vocal Techniques
C. General Music
201. Foundations of Music Education (3) I, II
202. Administration and Supervision of Music Education (3) I, II
204. Comparative Music Education (3) I, II
207. Composition ( 2 to 3 )
208. History and Development of Music Theory (3)
09. Advanced Orchestration (2) I, II
210. Electronic Music (3) I, II
211. Analytical Studies of Music (3) $\mathbf{1}, 11$
12. Advanced Contrapuntal Techniques (3) I, II
213. Seminar: Music Theory (3) I, II

246A. Advanced Choral Conducting (2)
246B. Advanced Instrumental Conducting (2)
250. Applied Music-Advanced Individual Study (2)
A. Piano
B. Organ
C. Voice
D. Oboe
E. Clarinet
G. Saxophone
H. Bassoon
J. French Horn
K. Trumpet
N. Tuba
M. Baritone Horn
252. Seminar in Music Hisfory (3)
A. Music of the Middle Ages and Renaissance
B. Music of the Baroque Era
C. Music of the Eighteenth and Nineteenth Centuries
D. Twentieth Century Music
E. American Music

## 253. Musicology (3)

255. Seminar: A Major Composer (3) I, II
256. Seminars in the Notation of Polyphonic Music (3)
A. Notation of Soloistic Music: Scores and Tablatures.
B. Notation of Ensemble Music: White Mensural Notation
C. Notation of Ensemble Music: Black Notation to the End of Franconian No-
D. Notation of Ensemble Music: French, Italian, Mixed and Mannered Notation.
257. Seminar: Interpretation of Early Music (3) I, II
258. Research Procedures in Music (3)
259. Special Study (1-3)
260. Thesis or Project (3)

## Nursing

## In the College of Professional Studies

Agency Member of the National League for Nursing
Accredited by the California Board of Nursing Education and Nurse Registration and by the National League for Nursing

## Faculty

Professors: Atkinson (Acting Director), Blackmon, Coakley, Coveny, Johnson, E. G., Lee, P., Moses

Associate Professors: Black, Laiho, Salerno
Assistant Professors: Flagg, J., Himes, La Monica, LaSor, Laws, Leslie, Maire, Moffett
Instructors: Brown, C., Conway, Hull, Mayberry
Lecturers: Johnson, D., Richards, T.

## Offered by Nursing

Major with the B.S. in applied arts and sciences

## Major with the B.S. in Applied Arts and Sciences

The curriculum in nursing requires completion of a minimum of 128 units as prescribed, with a grade of C or better in each nursing course completed in satisfaction of requirements for the degree. Directed clinical experience in hospitals and health agencies in San Diego County is an integral part of the program. Graduates are eligible to apply for licensing as a registered nurse
All students, including registered nurses, are subject to the same requirements. owever, graduates of associate degree and diploma programs in nursing may, after evaluation of their competency, be placed in appropriate advanced nursing classes.
Preparation for the major. Chemistry 2A-2B; Microbiology 1; Zoology 8; Biology 9; Sociology 1; Psychology 1; three units in normal nutrition; three units Biology 9; Sociology 1; Psychology 1; three units in normal nutrition; three units units in marriage and the family. ( 37 units.)
Maior. A minimum of fifty units in Nursing to include Nursing 100A-100B, Major. A minim $105,106,116,130,131,132,133,134,135,136,137$. Any grade bew a C is unacceptable in nursing courses.

## Prerequisites

Enrollment in a nursing course will be canceled if the student has not completed e prerequisites for the course with a grade of C or better.

## 00A-100B. Foundations of Nursing (2-2) 1, II

One lecture and three hours of laboratory.
Prerequisites: admission to the nursing major; and concurrent registration in
Prersing 101, 102, 103, 104. 100 A is prerequisite to 100 B .
Principles and practice of nursing to meet the basic needs of patients.

## 01. Maternal-Neonatal Nursing (3) I, it

Prerequisites: Three units in marriage and the family. Concurrent registration in Nursing 100A.
Principles of care of mothers, and newborn infants with emphasis on the importance of family relationships. Not open to students with credit in Nursing 112.
102. Maternal-Neonatal Nursing Experience (3) I, II

Nine hours of laboratory.
Prerequisite: Concurrent registration in Nursing 101,
Directed clinical experience in the care of mothers and newborn, infants including all phases of the maternity cycle.

## 103. Psychiatric and Mental Health Nursing (3) I, II

Prerequisites: Three units in human growth and development; three units in personality development; and concurrent registration in Nursing 102.
Basic principles of communication and interpersonal relations in nursing; recog. nition of normal and disturbed communication; principles and techniques for dealing with continuum of normal and abnormal behavior. Not open to students with credit in Nursing 118.
104. Psychiatric and Mental Health Nursing Experience (3) I, I

Nine hours of laboratory
Prerequisite: Concurrent registration in Nursing 103.
Directed clinical experience, focusing on the psychotherapeutic role of the nurse a variety of settings.

## 05. Nursing Care of the Adult Patient (4) I, II

Prerequisites: Nursing 100A. Concurrent registration in Nursing 100B and 106
Study of health problems of adults resulting from deviations in homeostasis and of medical and/or surgical therapies and nursing therapies utilized to restore optimum health. Not open to students with credit in Nursing 33B and 34B.
106. Experience in Nursing Care of the Adult Patient (4) I, II

Twelve hours of laboratory.
Prerequisite: Concurrent registration in Nursing 105.
Directed clinical experience in the care of adult patients with medical and/or surgical health problems.

## 116. Trends in Nursing (2) I, II

Prerequisite: Credit or concurrent registration in Nursing 105.
Place of nursing in world history and the present social order.

## 118. Psychiatric Nursing (5) I, II

Two lectures and nine hours of laboratory.
Prerequisite: Credit or concurrent registration in Psychology 131.
Major concepts of psychiarric nursing and mental
are of the mentally ill; therapies and rehabilitation mealth that are involved in offered for the last time in 1971-72.)
120. Practicum in Clinical Nursing (3) I, II

One lecture and six hours of laboratory
Prerequisites: Nursing 112, 114, and 116.
Development of ability for making a nursing diagnosis, and taking appropriate action. (This course will be offered for the last time in 1971-72.)

## 124. Leadership Roies in Nursing (4) I, il

Two lectures and six hours of laboratory.
Prerequisite: Nursing 116
Professional and legal responsibilities of the nurse; selected practice activities the role of team leader. (This course will be offered for the last time in 1971-72.)

## 125. Public Health Nursing (4) I,

${ }_{126}$ Prerequisites: Nursing 112, 114, and credit or concurrent registration in Nursing
Principles of Public Health Nursing and organization and administration of health services. (This course will be offered for the last time in 1971-72.)
126. Public Health Nursing Practice (5) I, II

Fifteen hours of laboratory.
Prerequisite: Concurrent registration in Nursing 125.
Guided public health nursing practice in community health agencies, out-patient clinics, schools and homes. (This course will be offered for the last time in 1971-72.)
130. Child Health Nursing (2) I, II

Prerequisites: Nursing 106. Concurrent registration in Nursing 131, 132, 133.
Nursing care needs of the well and the sick child from birth through adolescence. Not open to students with credit in Nursing 114

## 31. Child Health Nursing Experience (4) I, II

Twelve hours of laboratory.
Prerequisite: Concurrent registration in Nursing 130.
Directed clinical experience in hospitals, clinics, and schools.
132. Community Health Nursing (3) I, II

Prerequisites: Three units in community epidemiology; Nursing 106. Concurent registration in Nursing 131.
Community facets with emphasis on the family centered approach in providing nursing service. Not open to students with credit in Nursing 125

## 33. Community Heairh Nursing Experience (3) I,

Nine hours of laboratory.
Prerequisite: Concurrent registration in Nursing 132
Directed experience in a community health agency which encompasses as its Djective the promotion of health and the prevention of disease of each member of the family. Not open to students with credit in Nursing 126.

## 134. Advanced Medical-Surgical Nursing (2) I, I

Prerequisites: Nursing 130. Concurrent registration in Nursing 135
Common problems in the care of the acutely ill patient and the patient with continuing health problems requiring a planned rehabilitation program. Not open o students with credit in Nursing 120

## 35. Experience in Advanced Medical-Surgical Nursing (2) I, II

Six hours of laboratory.
Prerequisite: Concurrent registration in Nursing 134
Directed clinical experience in the nursing care of the acutely ill patient and the long-term patient requiring rehabilitation and teaching.

## 136. Leadership in Professional Nursing (2) I, II

Prerequisites: Nursing 130. Concurrent registration in Nursing 116 and 137.
Principles of leadership and supervision are stressed as a means of developing ffective relationships whin the heaten. his leadershility as a citizen. Not ional individual is emphasized in Nursing 124.

## 37. Management of Patient Care in a Nursing Unit (2) I, 1

## Six hours of laboratory

Prerequisite: Concurrent registration in Nursing 136.
Directed clinical experience in planning, directing, giving, and evaluating patient
Directed clinical experience in planing, Team nursing concept and methods are utilized. Methods care in a nursing unit. Team nursing conced.

## 160. School Nursing (3) Extension

Prerequisite: Nursing 125, or equivalent to be determined by examination.
The application of health principles and current best practices in schools with mphasis on the functions of the school nurse related to the school, home, and community
175. Nursing in School Health Services (2) I, II

Prerequisites: Nursing 125, 126; concurrent registration in Nursing 176. The philosophy of school health, the functions and responsibilities of the school nurse in planning, organizing and implementing a program of school health services.
176. Practicum in School Health Nursing Services (4) I, II

Twelve hours of laboratory.
Prerequisites: Nursing 125, 126; concurrent registration in Nursing 175.
Supervised field practice and experience in public school nursing.

## Oceanography

## Administered by the Dean of the College of Sciences

## 100. The Oceans (2) I, II

Prerequisites: One introductory college course in a life science and one in a physical science:
Biological and physical aspects of the oceans and their significance to man; problems of modern oceanography.
For additional courses in Oceanography see
Biology 113. Biological Oceanography.
Chemistry 180. Chemical Oceanography
Geology 140. Marine Geology
Geology 140. Marine Geology
Physical Science 110. Physical Oceanography
Zoology 150. Marine Biology
108. Recent Existentialism (3) I

Prerequisite: Six units of philosophy.
The philosophical aspects of Existentialism. Major emphasis is on the diversity of thought within a common approach as this is shown in individual thinkers.

## 109. Ordinary Language Analysis (3)

Prerequisite: Six units of philosophy.
The application of linguistic analysis to basic philosophical problems.

## 110. Philosophy of Law (3) I

Prerequisite: Philosophy 1A, 1B or 20, and three units of Political Science.
The nature of law and the logic of legal reasoning. An exploration of certain key legal concepts such as causation, responsibility, personality, and property.

## 112. Political Philosophy (3) II

Prerequisite: Philosophy 1A.
Selected aspects of the political structures within which we live, such as law, power, sovereignty, justice, liberty, welfare.

## 21. Deductive Logic (3) I

Prerequisites: Philosophy 20 or Mathematics 60.
Principles of inference for symbolic deductive systems; connectives, quantifiers, relations and sets. Interpretations of deductive systems in mathematics, science, and ordinary language. Not open to students with credit in Mathematics 155.

## 122. Inductive Logic (3) if

Prerequisite: Philosophy 20.
Definition, classification, and division. The logic of experimentation and statistics. Formation and validation of hypotheses. Probability theories.

## 23. Theory of Knowledge (3)

Prerequisite: Philosophy 1B.
The major theories of human knowledge: mysticism, rationalism, empiricism, pragmatism.

## 125. Metaphysics (3) II

Prerequisite: Philosophy 1B.
Prominent theories of reality, e.g., realism and nominalism, materialism and dealism, teleology and determinism.

## 127. Values and Social Science (3) II

Prerequisite: Six units of philosophy.
Analysis and discussion of the nature of values and value-judgment with particular reference to the social sciences. Among relevant issues. the naturalistic fallacy, facts and values; authoritarianism, emotivism, objective relativism; the individual and the community.

## 128. Theory of Ethics (3) I

Prerequisite: Six units of philosophy.
Significant and typical value theories and systems and the concrete problems such theories seek to explain. The emphasis will be placed on moral values.

## 129. Social Ethics (3)

Prerequisite: Philosophy 1A.
Ethical isues of contemporary life. Individualism vs. collectivism; democracy vs. dictatorship; ethical problems arising in law, medicine, business, government, and interpersonal relationships.
131. Philosophy of Language (3) II

Prerequisite: Six units of philosophy.
An introduction to theories of meaning for natural languages and formal sysans, concepts of truth, synonymy and analyticity; related epistemological and

## 132. Philosophy of History (3) I

Prerequisite: Six units of philosophy.
The nature of history and historical inquiry. As metaphysics: a study of theories or historical development. As methodology: history as science, truth and fact in .

## 133. Philosophy of Education (3) H

Prerequisite: Philosophy 1B.
Various philosophical viewpoints concerning education. The functions of eduation as conceived by major figures in the western philosophical tradition

## 134. Philosophy of Literature (3)

Prerequisite: Six units of philosophy.
Study of literature of philosophical significance, and of philosophical problems
f literature. of literature.

## 135. Philosophy of Religion (3) I, II

Prerequisite: Six units of philosophy.
The philosophical significance of major themes in religious thought. The role of myth and the nature of religious language.

## 36. Jewish Philosophy (3)

Prerequisite: Three units of philosophy.
Outstanding men and movements, e.g., Biblical ethics and law, Philo of Alexanand Martin Buber.

## 137. Philosophy of Science (3)

Prerequisite: Six units of philosophy
The basic concepts and methods underlying contemporary scientific thought

## 141. History of Aesthetics (3)

Prerequisite: Philosophy 1A
Major documents in the history of aesthetics.

## 142. Philosophy of Art (3) It

The nature of aesthetic experience. Principal contemporary theories of art in relation to actual artistic production and to the function of art in society. (Formerly
Philosophy 136.)

## 164. American Philosophy (3)

Prerequisite: Six units of philosophy.
A systematic and critical study of the work of American philosophers from James, Royce, Santayana, Dewey, and Whitehead.

## 175. A Major Philosopher (3) I, I

Prerequisite: Philosophy 101.
The writings of one major philosopher. May be repeated with new content for additional credit. Maximum credit six units applicable to the major. Maximum
credit six units applicable on a master's degree.
195. Selected Topics (3) I, II

Prerequisite: Six units of philosophy.
A critical analysis of a major problem or movement in philosophy. May be repeated for credit with different content. Maximum credit six units applicable
toward the major in philosophy. Maximum credit six units for both 195 and 295 applicable on a master's degree.
201. Seminar in Ancient Philosophy (3)
202. Seminar in Medieval Philosophy (3)
203. Seminar in Modern Philosophy (3)
205. Seminar in Contemporary Philosophy (3)
211. Seminar in Legal Philosophy (3)
212. Seminar in Political Philosophy (3)
221. Seminar in Deductive Logic (3)
223. Seminar in Epistemology (3)
225. Seminar in Metaphysics (3)
228. Seminar in Ethics (3)
231. Seminar in Semantics and Logical Theory (3)
235. Seminar in Philosophy of Religion (3)
236. 'Seminar in Philosophy of Art (3)
237. Seminar in Philosophy of Science (3)
295. Seminar in Selected Topics (3)
298. Special Study (1-3)
299. Thesis (3)

Physical Education

## In the College of Professional Studies

Faculty
Emeritus: Schwob, Shannon, Sportsman
Professors: Andrus, Benton, Carter, Governali, Kasch, Lockman, Murphy, M. L Olsen, A., Olsen, L., Phillips, W. H. (Chairman), Scott, Terry, Tollefsen,
Associate Professors: Broadbent, Cave, Cullen, Fox, Sucec, Wells
Assistant Professors: Barone, Franz, Freidman, Hollyfield, Landis, Palmiotto, Rountree, Selder, Smith, B., Whitby, Wilhelm, Williamson, G., Willis

## Offered by the Department

Master of Arts in physical education.
Major in physical education with the A.B. in applied arts and sciences.
Teaching major in physical education with specialization in secondary teaching. Minor in physical education.
Teaching minor in physical education with specialization in both elementary and
secondary education. secondary education.
Minor in dance.

## Physical Education Major

## With the A.B. Degree in Applied Arts and Sciences

Students majoring in physical education must complete a minor in another field.

## Major for Men.

Preparation for the major. Physical Education 8A, 9A, 10A, 12A, 29B, 52, 70,71 73; Zoology 8 ( $161 / 2$ units). Students may be excused from skill courses by passing a competency test.
Major. A minimum of 29 upper division units to include Physical Education 162, units to be selected from physical education. units to be selected from physical education.

## Major for Women

Preparation for the major. Physical Education $33 \mathrm{~A}, 33 \mathrm{~B}, 34 \mathrm{~A}, 34 \mathrm{~B}, 52,56 \mathrm{~A}, 56 \mathrm{~B}$, one unit of physical education activity elective; Zoology 8 (14 units).
Major. Twenty-seven upper division units to include Physical Education 151 or
154,155 or $156,160,167,168$ and 12 units 154, 155 or $156,160,167,168$, and 12 units from health education and/or physical education courses selected with approval of the department adviser.

## Emphasis in Dance

Preparation for the major. Physical Education 48A, 48B, 54, 81, 82; one unit
selected from Physical Education 33A, 33B, 34A, 34B; Zoology 8; and 16 units selected tion 11A, Drama 5, 8, 30, 31, and 50. ( 28 units.)
Major. A minimum of 24 upper division units to include three to four units from
Physical Education 151 or $153 \mathrm{~A}, 154,157 \mathrm{~A}, 181$. Physical Education 151 or $153 \mathrm{~A}, 154,157 \mathrm{~A}, 181,182 \mathrm{~A}, 182 \mathrm{~B}, 183,184$, and two from of upper division electives to be selected with the approval of the dance adviser In addition to course requirements, the student must be a member of the Danceprograms proferably in the junior and senior years. Sum of four semesters of dance tion will require departmental approval. (The physical edurion for such participaemphasis in dance does not meet the credential pattern for education) with an

For the Standard Teaching Credential, with Specialization in Secondary Teaching

## Major for Men

Requirements are the same as the requirements for the A.B. degree in applied arts and sciences as outlined above. In addition, students must complete, in their postgraduate year, a minimum of six units of 200 -numbered courses approved by the department adviser.

## Major for Women

Candidates for a teaching major for women must in addition to the basic requirements, select the generalist program or two areas of concentration. Courses may be used to satisfy requirements in more than one concentration.
Basic Requirements for All Students

Preparation for the major. Physical Education 11A, 29B, 32A, 33A, 34A, 47A, 5A-55B, 56A or 56B, Zoology 8 (10 units).
Major. Thirty upper division units to include Biology 140, Physical Education 160, 162, 167, 168 (15 units)
Postgraduate Year. Six units of 200 -numbered courses approved by the department adviser.

## Generalist Program

Additional preparation for the major. Physical Education 7A, 33B, 34B, 52, $56 \mathrm{~A}-56 \mathrm{~B}\left(5^{1 / 2}\right.$ units)
Maior (continued). Physical Education 151, 152, 154, 155, 156, and 122 or 172 (16-17 units).

## Concentrations

a) Team Sports

Additional preparation for the major. Physical Education 7A, 52, 57A or 57B, Additional preparation for the major. Physical Education 7A, $52,57 \mathrm{~A}$ or 57 B ,
58 A or $58 \mathrm{~B}, 1 / 2$ unit intramural or extramural sport, and 1 unit of elective ( 6 units). Major (continued). Physical Education 156; 9 units selected from 151, 152, 154, 55,172 , and 3 units electives ( 15 units)
b) Individual Sports

Additional preparation for the major. Physical Education 7A, 16B, 17B, 18B, 19 A or $19 \mathrm{~B}, 20 \mathrm{~B}, 22 \mathrm{~A}$ or $22 \mathrm{~B}, 52$, and $1 / 2$ unit of elective ( 6 units).
Major (continued). Physical Education 155; 9 units selected from 151, 152, 154, Major (continued).
56,172 , and 3 units of electives ( 15 units).
c) Gymnastics

Additional preparation for the major. Physical Education 40, 46, 47B, 52, and 2 units of electives ( 6 units).
Major (continued). Physical Education 152; 9 units selected from 151, 154, 155, 156,172 , and 3 units of electives ( 15 units)
d) Aquatics

Additional preparation for the major. Physical Education 7A, 24A, 30A or 30B, $36 \mathrm{~A}, 50$, and 3 units of electives ( 6 units)

Major (continued). Physical Education 122; 9 units selected from 151, 152, 154, 155, 156; and 3 units of electives ( 15 units).
e) Folk Dance
(ditional preparation for the major. Physical Education 33B, 52 or 81, 82, and $11 / 2$ units of electives ( 6 units)

Major (continued). Physical Education 151; 9 units selected from 152, 154, 155, 156, 172; and 3 units of electives.
f) Modern Dance

Additional preparation for the major. Physical Education 34B, 39, 48A-48B, 81, 82 ( 6 units)

Mat (continued). Physical Education 154; 9 units selected from 151, 152, 155, 56, 172; and 3 units $157 \mathrm{~A}-157 \mathrm{~B}, 183$ ( 15 units).

## Physical Education Minor

The minor, planned in consultation with an adviser, consists of 15 units in physmust be upper division

## Physical Education Minor

For the Standard Teaching Credential

## Specialization in Elementary Teaching

Minor for men. The minor in physical education (men) for elementary teaching consists of not less than 20 units to include, in the lower division, Physical Education 53, 71,73 , and four units to be selected from physical education or recreation; Recreation 140 , and two units to be selected from 175, 177, Health Education 146, Minor for women. The minor in physical from physical education or recreation. minor for women. The minor in physical education (women) for elementary Education 1A $, 7 \mathrm{~A}, 7 \mathrm{~B}, 33 \mathrm{~A}, 34 \mathrm{~A} 33 \mathrm{~B}$ or to include, in the lower division, Physical unit elective , and in the upper division 11 units to $56 \mathrm{~A}, 56 \mathrm{~B}$, Recreation 70 , and one or 154, 152, 156, and 162.

## Specialization in Secondary Teaching

Minor for men. The minor in physical education (men) for secondary teaching ucation $8 \mathrm{~A}, 9 \mathrm{~A}, 10 \mathrm{~A}, 12 \mathrm{~A}, 29 \mathrm{~B}, 52,71$, and 73 ; ind the lower division, Physical Ed Education 174, 175, 176, 177, Recreation 140. Health, Education 146 division, Physical units to be selected from either Physical Education 180 series, field two to three intramurals, or recreation, or Physical Education 151.
Minor for women. The minor in physical education (women) for secondary
teaching consists of a minimum of 25 units to include teaching consists of a minimum of 25 units to include, in the lower division, Physical Education $1 \mathrm{~A}, 7 \mathrm{~A}, 7 \mathrm{~B}, 16 \mathrm{~A}, 17 \mathrm{~A}, 18 \mathrm{~A}, 20 \mathrm{~A}, 32 \mathrm{~A}, 33 \mathrm{~A}, 33 \mathrm{~B}, 34 \mathrm{~A}, 34 \mathrm{~B}, 52,56 \mathrm{~A}$ 56B, and in the upper division, 15 upper division units in physical education to
include Physical Education 151 or 154 , and 155 or 156 .

## Dance Minor

The minor in dance consists of Physical Education 33A-33B, 34A-34B, 48A-48B, 81, 82; two units selected from Physical Education 153A or $184,181,182 \mathrm{~A}$, and
182 B ; and 3 upper division units to be selected from 182B; and 3 upper division units to be selected from the areas of art, music, drama,
and others, with the approval of the adviser in dance, ( 21 units.

## Required Activity Courses

To meet general education requirements, four semesters of activity courses or monitored activity are required. All freshman and sophomore students must enroll
in an activity course or monitored activity each semester. Two in an activity course or monitored activity each somester. Two units are needed for general education and graduation, but no more than one activity course or
monitored activity in any one semester may be counted toward this requirement. An activity course taken in the summer session may be counted in lieu of onent. taken during the fall or spring semester. Any combination of activity courses and monitored activity may be used.

## Exemptions or Postponements

Veterans who have served a minimum of one continuous year in the United
States armed forces are exempted from the general education requirem States armed forces are exempted from the general education requirement in phys-
ical education. Students over 25 years of age may also be exempted ical education. Students over 25 years of age may also be exempted from the general education requirement in physical education upon approval by the Vice Press-
dent for Academic Affairs or duly authorized representative. Sudents dent for Academic Affairs or duly authorized representative. Students carrying
fewer than 12 units during any semester may apply to the chairman of the Physical fewer than 12 units during any semester may apply to the chairman of the Physical
Education Department for a postponement of the physical education activity requirement. For reasons of health, the Director of Health Services may postpone the errollment of a student in a physical education activity course. Permanent postponement from the activity requirement will not be made and a postponement
does not eliminate the graduation requirement.

A health history record is required of each student entering college. Adapted A health history record is required of each student entering college. Adapted
physical education classes to care for special needs are offered. The content of physical education classes to care for special needs are offered. The content of
the required courses is planned to give each student an opportunity to participate the required courses is planned to give each student an opportunity to participate
in many activities of carry-over value, developmental nature, and recreational interest. An opportunity is afforded students to participate in competitive sports in the extramural and intramural programs.
Courses offered for one-half unit credit meet two hours per week or equivalent. " A " signifies a beginning class, " B " intermediate or advanced.
1A-1B. Fundamental Skills ( $1 / 2-1 / 2$ ) I, II
2A-2B. Conditioning $(1 / 2-1 / 2)$ I, II
6A-6B. Team Sports ( $1 / 2-1 / 2$ ) I, II
7A-7B. Gymnastics ( $1 / 2-1 / 2$ ) I, II
8A-8B. Basketball ( $1 / 2-1 / 2$ ) I, II
9A-9B. Soccer ( $1 / 2-1 / 2$ ) 1 , II
10A-10B. Volleyball ( $1 / 2-1 / 2$ ) I, II
11A-11B. Track and Field $(1 / 2-1 / 2)$ I, II
12A-12B. Wrestling ( $1 / 2-1 / 2$ ) I, II
16A-16B. Golf $(1 / 2-1 / 2) 1$, II
17A-17B. Archery ( $1 / 2-1 / 2$ ) I, II
18A-18B. Tennis ( $1 / 2-1 / 2$ ) I, II
19A-19B. Bowling ( $1 / 2-1 / 2$ ) I, II
20A-20B. Badminton ( $1 / 2-1 / 2$ ) I, II
21A-21B. Handball ( $1 / 2-1 / 2$ ) I, II
22A-22B. Fencing ( $1 / 2-1 / 2$ ) 1 , II
24A-24B. Water Craft $(1 / 2-1 / 2)$ I, II
29A-29B. Swimming ( $1 / 2-1 / 2$ ) I, II
30A-30B. Synchronized Swimming $(1 / 2-1 / 2)$ I, II
32A-32B. Ballroom Dancing $(1 / 2-1 / 2)$ I, II
33A-33B. Folk and Square Dancing ( $1 / 2-1 / 2$ ) I, II
34A-34B. Modern Dance $(1 / 2-1 / 2)$ I, II
36A-36B. Selected Activities ( $1 / 2-1 / 2$ ) I, II
May be repeated with new activity for additional credit. See class schedule for semester offerings.
38. Individual Adaptives ( $1 / 2$ ) $\mathbf{I}, \mathbf{I I}$

Prerequisite: Consent of instructor.
Individual exercise programs for those who are handicapped in some respect, or who have functional defects, or deficiencies amenable to improvement through exercise. May be repeated for credit.

## 39. Basic Ballet ( $1 / 2$ ) I

40. Ballet for Gymnastics ( $1 / 2$ ) II

## Men and Women

Professional Theory Courses
46. Rhythmic Gymnastics (1) 1,1

Four hours of laboratory.
Progressive skills in free exercise, use of hand apparatus, and tumbling for gymnastics teachers.

47A-47B. Professional Activities: Gymnastics (Women) ( $1 / 2-1 / 2$ ) I, II
Two hours of laboratory.
Study and development of competencies, skills, and knowledges needed for teaching and coaching girls' and women's gymnastics.

## 73. Dance (Men) (2) I, II

Six hours of laboratory
Competency development in dance. Emphasis on skills, movements, facilities, and
organizational procedures in

## 81. Introduction to Dance (2)

Dance as an art form with emphasis on the development of contemporary trends American dance personalities and their contribution. Required of all physical education majors with an emphasis in dance.
82. Rhythmic Analysis Related to Movement (2) II

Music as related to movement; notation and simple music forms applied to all movement activities; percussion accompaniment; writing of percussion scores;
music repertoire for dance.

## 122. Water Safety Instruction (1) II

Four hours of lecture and laboratory.
Prerequisites: P.E. 29B or equivalent, and current American Red Cross Senior
Life Saving Certificate.
Methor
wimmers for American Red Cross Swimming Instructors designed to qualify expert

## 123. Skin and Scuba Diving (2) I, II

One lecture and three hours of laboratory.
Prerequisites: Thesis or class project requiring underwater collection techniques or Physical Education 29B. Medical examination, waiver for hazardous procedures, passage of competency test in swimming.
Functional knowledge of underwater diving to include diving physiology, hyperbaris conditions, medical hazards, safety procedures associated with Scuba Diving and proper care and operation of equipment.
151. Folk and Social Dance Skill Analysis (Men and Women) (3)

Two lectures and three hours of laboratory.
Prerequisites: Physical Education 32A and 33B, or completion of folk and social Folk customs, festive
Folk customs, festivals, and costumes. Selection of dance materials for various
age groups. Analysis of teaching techniques.
52. Gymnastics Skill Analysis (Women) (3) I

Two lectures and three hours of laber (3)
Prerequisites: Physical Education 7A and 7B, or completion of competencies
tests in gymnastics and related fields. Advanced materials in tumbling and
spotting, etc. Analysis of teaching techniques and progressions on safety devices,
153A-153B. Problems in Dance (2-2
Prerequisite: Physical Education 48A
Problems in ethnic or modern dance: history, anthropological basis, stagecraft,
154. Modern Dance Skill Analysis (Women) (3) II

Two lectures and three hours of laboratory.
modern dance.
Advanced skill techniques with emphasis on individual choreography. Selection
of materials and course planning for the secondary ence. Brief survey of basic literature and current readings in. Class teaching experi-
155. Individual Sports Skill Analysis (Women) (3) il

Two lectures and three hours of laboratory.
Prerequisites: Physical Education 16A, 17A, 18A, 20A, or completion of competencies tests in archery, badminton, golf, and tennis.
Individual playing techniques, knowledge, rules, and teaching methods in tennis, for senior majors in physical education who are expected to demonstrate a high degree of competency in the sports indicated.
156. Team Sports Skill Analysis (Women) (3) I

Two lectures and three hours of laboratory.
Prerequisites: Physical Education 56A and 56B, or completion of competencies tests in basketball, hockey, soccer, speedball, softball and volleyball, and track and field.

Skills, teaching techniques, officiating, and the organization of materials in team sports for women.
157A-157B. Choreography in Contemporary Dance (Men and Women) (3-3)
Two lectures and three hours of laboratory.
Prerequisite: Consent of instructor.
Experimentation in dance, relating contemporary theories to other art forms. Force and time-space relationships as factors of choreography. Semester I: Production problems for large and small groups. Semester II: Production problem for trios, duos, and solos.
160. Mechanics of Body Movement (Women) (3) II

Two lectures and three hours of laboratory.
Prerequisite: Physical Education 167.
Efficient use of the body in daily living; evaluation and classification of exercises, study of methods and practice in planning and presenting material.

## 161. The Psychological Bases of Physical Education (3) I, II

Prerequisite: Physical Education 162.
Current issues, experimentation, problems and literature involved in the psychology of motor learning and motor performance.
162. Measurement and Evaluation in Physical Education (3) I, II

Existing skills, tests, and other forms of evaluation used in physical education programs, including practical measuring and comparisons with norms, standards, etc. Closely related to required competencies tests for physical education majors with applications to use in teaching.
163. Physical Growth and Development (3) II

Principles of human growth; performance as affected by developmental levels and individual differences in structure and function.
164. Athletic Injuries (Sports Medicine) (2) I, II

One lecture and three hours of laboratory.
Prerequisite: Physical Education 167.
Prevention and care of athletic injuries. Environment and hazards of sports. Firs aid. Use of prescribed modalities.
165. Organization and Administration of Extracurricular Activities (3) I, II

Two lectures and one hour of laboratory.
Material covering the organization and administration of activities such as dril teams, extracurricular clubs, special events and programs, cheerleaders, intramural and extramural activities.
167. Applied Anatomy and Kinesiology (3) I, II

Prerequisites: Zoology 8 and Biology 140.
Arthrology, syndesmology, and myology, with special emphasis on movement analysis. Muscle groups and their functional relationships. Application of simple mechanical principles to movement analysis.
168. Physiology of Exercise (3) I, II

Prerequisites: Zoology 8 and Biology 140
Effects of physical activities on the physiological functions of the body

## 169. Adapted Activities (2) I,

One lecture and three hours of laboratory.
Prerequisites: Physical Education 167 and 168, Biology 140, and Zoology 8.
Adaptation of programs for the atypical individual, including physical examinations, training, and prescribed exercises, follow-up, instructional problems, and evaluation.
171. History and Philosophy of Physical Education (3) Irregular

Review of the historical and philosophical bases for dance, exercise, games, and sports with emphasis on the United States.

## 72. Aquatics (2) I, II

Four hours.
Prerequisite: Physical Education 29B or demonstrated competency
Emphasis on skills, movements, rules, officiating, facilities, and organizational procedures in aquatis.

## (2. Combarives (Men) (2) I, II

Four hours.
Prerequisite: Physical Education 12A or demonstrated competency emphasis on teaching and coaching procedures.

## 175. Team Sports (Men) (2) I, II

Four hours.
Prerequisites: Physical Education 8A, 9A, and 10A, or demonstrated competency rules, officiating, facilities, and team sports. Emphasis on skills, strategy, tactic rules, officiating, facilities, and organizational procedures in selected team sports
176. Individual Sports (Men) (3) I, II

Seven hours.
Competency development in archery, badminton, golf, handball, and tennis Emphasis on skills, strategy, tactics, rules, officiating, facilities, and organizational
procedures in individual sports.
177. Physical Fitness (Men) (1) I, II

One lecture and two hours of laboratory.
Prerequisite: A conditioning course in the required program, or demonstrated
competency. Skill,
Skills, movements, facilities, and organizational procedures in physical fites programs. History and current role in the curricula.
178. Workshop in Physical Education (1-2)

Methods, techniques and development of skills in such tives, gymnastics, rhythmis and dance, and individual and team sports. Designed combasecondary school administrators, teachers, coaches, recreation sports. Designed for May be repeated for a total of six units. May not be usedion and youth leaders. ducation major for either degree or teaching credential
179. Supervised Field Experience (1-3) I, II

Prerequisites: Senior standing and consent of the department chairman.
Supervised practical experience in physical education.
181. History and Philosophy of Dance (2) II
(Offered in alternate years)
The cultural background of all forms of dance in various civilizations with emphasis on the relationship of the social structure to the existing dance forms.

182A. Dance Composition (Preclassic Forms) (3)
(Offered in alternate years)
Two lectures and three hours of laboratory.
Prerequisites: Physical Education 54 and 82.
Compositions based on a study of preclassic dance forms as a contribution to form in contemporary dance. Study of the music of the period. Critical evaluation of group and individual compositions.
182B. Dance Composition (Modern Forms) (3) It
(Offered in alternate years)
Two lectures, three hours of laboratory.
Prerequisites: Physical Education 54 and 82.
Compositions related to contemporary art forms emphasizing the interaction of form and content in the creative idea. The temporal, spatial, dynamic, and dramatic elements of choreography.
183. Dance Production (3) II

Lecture-demonstration, recital, and concert forms of dance programs. Presentation and staging of original solo and group compositions

## 184. Workshop in Dance (1-2) I, II

Choreographic techniques and skills with visiting master teachers; written report or project. May be repeated to a total of four units.

## 200. Seminar (3)

201. Curriculum in Physical Education (3)
202. Administration of Physical Education in the Secondary Schools (3)
203. History of Physical Education (3)
204. Problems in Recreation (3)
205. Current Trends and Issues in Physical Education (3)
206. Seminar in Competitive Athletics (3)
207. Advanced Kinesiology and Biomechanics (3)
208. Advanced Physiology of Exercise (3)
209. Advanced Adapted Activities (3)
210. Seminar in Facilities for Physical Education (3)
211. Advanced Evaluation in Physical Education (3)
212. Problems in Physical Education (3)
213. Seminar in Dance Programs (3)
214. Philosophical Foundations for Physical Education (3) I
215. Principles of Neuromuscular Tension (3)
216. Exercise Electrocardiography (3) I, II
217. Advanced Exercise Physiology Laboratory (3)
218. Fitness of Adults (3) I, II
219. Seminar in Motor Learning and Motor Performance (3)
220. Research Techniques (3)
221. Seminar in Physical Education (3)
222. Special Study (1-3)
223. Thesis (3)

## Physical Science

In the College of Sciences

## Faculty

Emeritus: Watson
Professors: Dessel (Chairman), Merzbacher, Stewart, P.
Associate Professor: Shull
Assistant Professors: Anderson, L., Ingmanison, Metzger, Shideler, Springer,
Thompson, Wallace

## Offered by the Department

Master of Arts in physical sciences for teaching.
Teaching major in the physical sciences, with specialization in both elementary and secondary teaching. See "School of Education" in the catalog section for description of an interdesartmental Minor in physical science.

## Minor

The minor consists of 15 units, including Physical Science 1, 2, 3, 4, and 130 or 150 ; three additional upper division units are to be chosen with guidance from the departmental adviser.

1. Principles of Physical Science (3) I, II

Not open to students with credit for or concurrent registration in Physical
Science 5. cience 5.
The nature of the physical universe with emphasis on the whole field of physical science rather than on its separate divisions. May be followed by or, preferably,
taken with Physical Science 3 for laboratory credit in natural science. taken with Physical Science 3 for laboratory credit in natural science.

## 2. Principles of Physical Science (3) $\mathbf{I}$, II

Not open to students with credit for or concurrent registration in Physical cience 5 .
A continuation of Physical Science 1, which course is recommended but not required prerequisite. May be followed by or, preferably, taken with Physical
3. Experimental Methods in Physical Science (1) I,

Three hours of laboratory.
Prerequisite: Credit for or concurrent registration in Physical Science 1
Methods in physical science as illustrated by the use of significant examples from he various disciplines. The technique of observation, measurement, and discovery science area.
4. Experimental Methods in Physical Science (1) I, II

Three hours of laboratory.
Prerequisite: Credit for or coneurrent registration in Physical Science 2,
A continuation of Physical Science 3. Fulfills the general education laboratory
equirement in the natural science area.

## 5. Fundamentals of Physical Science (3) I, II

Not open to students with credit for or concurrent registration in Physical
Topics selected from Physical Science 1 and 2 to give a single course for the benefit of those students intending to take only one semester of physical science.
110. Physical Oceanography (3) I, II

Prerequisite: Physical Science 1.
Physical aspects of tides, waves, and currents

## 120. Physical Science for Elementary Teachers (3) I, II, $\mathbf{S}$

An integrated study of the physical sciences for teachers in order to provide a broad background of information, a consideration of current developments, and an opportunity for individualized work. Enrollment limited to those in training for or engaged in teaching in the elementary schools.

## 130. Modern Physical Science (3) I, I

Recent and current developments in the physical sciences. Discussions concerning such phenomena as radioactivity, cosmic rays, nuclear energy, tracer techniques, radio telescopy, supergalaxies. Not open for credit to physics majors.

## 135A-135B. IPS Physical Science (3-3) I, II

Two lectures and three hours of laboratory.
Prerequisites: Introductory course work in astronomy, geology, physical science or physics, and chemistry. Physical Science 135A is prerequisite to 135B.

Principles of physical science as presented in national curriculum study courses, particularly the IPS program of the Physical Science Study Committee.

## 1405. Contemporary Problems in Physical Science (1) S

A series of six weekly lectures on varied aspects of physical science. Reading and reports required of students enrolled for credit. May be repeated to a total of three units. These lectures are open to the public.
141. Electronics for Scientists (3) I, II,

Two lectures and three hours of laboratory.
Primarily for science majors.
Electronic instrumentation used in the sciences; uses and limitations.
142. History of Science $I$ (3) $\mathbf{I}$, $\mathbf{I}$

Prerequisites: completion of minimum general education requirements in science and six units of history
The growth and development of science from antiquity to the 15 th century. Emphasis on man's cognitive reactions to his environment through the coalescence of the occult arts, empirical practices, and rational thought associated with early scientific theory.
143. History of Science II (3) I, II

Prerequisite: Physical Science 142.
The major developments during the 16th through 19th centuries: the scientific revolution, the rise of empiricism, the emerging role of scientific societies. Histories of particular theories in both the life sciences and physical sciences.

## 150. Readings in Physical Science (3) I

Reading of selected materials with informal class discussion of topics. Emphasis on the historical background, the philosophical implications, and the impact of science on thought and culture.
160. The Development of Scientific Thought (3) I, II

Prerequisites: Six units from astronomy, chemistry, geology, physical science, or physics; and Mathematics 21 or equivalent.

Basic scientific concepts and their historical development with emphasis on the problem of theory construction. The relationship between disciplined imagination and observational fact, as illustrated by selected case histories. Limitations of scientific inquiry.
$9-81517$
169. Interpretation of Quantum Mechanics (3) I, II

Identity, causality, questions of reality; the uncertainty principle. Especially intended for upper division students in the humanities who are curious about modern science.

## 196. Advanced Physical Science (1-3) I, II

Prerequisite: Consent of instructor.
Selected topics in classical and modern physical science. May be repeated for additional credit with new subject matter for a total of six units.

## 200. Seminar (2 or 3)

298. Special Study (1-3)
299. Thesis or Project (3)

## Physics <br> In the College of Sciences

## Faculty

Emeritus: Terhune
Professors: Clark, O., Garrison, J., Moe, C., Morris, R., Skolil, Smith, Louis, Snodgrass, Teasdale, Templin (Chairman), Wolter
Associate Professors: Cottrell, D., Nichols, P. F., Piserchio, Rehfuss, Wolf, F.
Assistant Professors: Craig, R., Lilly, Roeder, Sarfatt

## Offered by the Department

Master of Arts in physics.
Master of Science in physics.
Major in physics with the A.B. in liberal arts and sciences.
Major in physics with the B.S. in applied arts and sciences.
Major in chemical physics with the B.S. in applied arts and sciences.
Teaching major in physics with specialization in both elementary and secondary teaching.
Minor in physics.
Teaching minor in physics with specialization in both elementary and secondary teaching.

## Physics Major

## With the A.B. in Liberal Arts and Sciences

To meet the foreign language requirement for graduation, students should choose French, German, or Russian.
A minor in mathematics is required. It should include Mathematics $50,51,52$, $118 \mathrm{~A}-118 \mathrm{~B}$, and three units from Mathematics $121 \mathrm{~A}, 150 \mathrm{~A}$, or 175 . Mathematics 104 is acceptable for students preparing for elementary or secondary teaching Students planning graduate work in physics should take additional mathematic listed
Preparation for the major. Chemistry 1A-1B or 10A-10B; Physics 4A-4B-4C or
$50-50 \mathrm{~B}$, and 73 . ( 25 units.) $50-50 \mathrm{~B}$, and 73. ( 25 units.)
Major. Twenty-four upper division units in physics to include Physics 100A$100 \mathrm{~B}, 102 \mathrm{~A}-102 \mathrm{~B}, 120 \mathrm{~A}-120 \mathrm{~B}$, and 170 . The students should choose the remaining units with the guidance of the departmental adviser. For preparation for graduate work in physics, the student should choose from Physics 106, 114, 151, 175,
$180,186,190,196,198$ A, and 198B.

## Physics Major

With the B.S. in Applied Arts and Sciences
Preparation for the major. Chemistry $1 \mathrm{~A}-1 \mathrm{~B}$ or $10 \mathrm{~A}-10 \mathrm{~B}$; Mathematics 50, 51 , and 52 ; Physics $4 \mathrm{~A}-4 \mathrm{~B}-4 \mathrm{C}$ or $50 \mathrm{~A}-50 \mathrm{~B}$, and 73 .
Major. Thirty-six upper division units in physics and mathematics to include Mathematics 118A-118B, Physics 100A-100B, 102A-102B, 120A-120B, 170, and 198A-198B. Courses are to be selected in consultation with the departmental ad viser. Concentrations in the areas of applied physics, physical electronics, nuclear physics, optics, and teacher education are available in this degree.

## Chemical Physics Major

## With the B.S. Degree in Applied Arts and Sciences

Preparation for the major. Chemistry 1A-1B or 10A-10B, 5, and 12; Mathematics 50,51, and 52; Physics 4A-4B-4C or $50 \mathrm{~A}-50 \mathrm{~B}$ ( 43 units)
Major. Thirty-nine upper division units to include Chemistry 110A-110B, 112,
nd 127 A . Chemistry 102A-102B , and 190; Physics 120A; Mathematics 118A or 118B; Physics 100A-100B, 102A-102B, and 190; Physics 120A or 120B.

## Physics Major

## For the Standard Teaching Credential

The major in physics for elementary or secondary teaching is the same as the major for the A.B. in liberal arts and sciences or for the B.S. in applied arts and sciences, except that for secondary teaching the student must take six units of physics in addition in his postgraduate year. All courses in the teaching major must ee approved by the adviser in physics for teaching programs.

## Physics Minor

The minor consists of 15 units in physics, six of which must be upper division.

## Physics Minor

## For the Standard Teaching Credential

The minor in physics for elementary or secondary teaching consists of 20 units in physics, six of which must be upper division. However, if the major for sec ondary teaching is not an academic major, 12 upper division units in physics must
be taken. be taken.
Maximum credit 12 units for any combination of Physics $1 \mathrm{~A}-1 \mathrm{~B}, 2 \mathrm{~A}-2 \mathrm{~B}, 3 \mathrm{~A}-3 \mathrm{~B}$,
5 , and $50 \mathrm{~A}-50 \mathrm{~B}$.
1A-1B. Elementary Physics (5-5) I, II
Four lectures and three hours of laboratory.
Prerequisites: Two years of high school mathematics. Physics 1A is prerequisite to 1B. Not open to students who have had high school physics.
This course is for students in those liberal arts and preprofessional courses not requiring physics with calculus. Physics 1 A is not open to students with credit in $2 \mathrm{~A} ; 1 \mathrm{~B}$ not open to students with credit in 2 B .

## 2A-2B. General Physics (3-3) I, II

Prerequisites: Completion of high school physics. Physics 2A in prerequisite to 2B. Recommended: Concurrent registration in Physics 2A and 3A and in Physics $2 B$ and 3B.
This course is for students in those liberal arts and preprofessional courses not requiring physics with calculus. Physics 2 A is not open to students with credit
in $1 \mathrm{~A} ; 2 \mathrm{~B}$ not open to students with credit in 1 B .

## 3A-3B. Physical Measurements (1-1) I, II

Three hours of laboratory.
Prerequisite for 3A: Credit or concurrent registration in Physics 2A.
Prerequisite for 3B: Physics 3A and credit or concurrent registration in
Physics 2B.
A laboratory course to accompany Physics 2A-2B. 3A: properties of matter mechanics, heat and sound. 3B: electricity, magnetism, and light.

4A-4B-4C. Principles of Physics (4-4-4) I, II
Three hours of lecture and three hours of laboratory.
Prerequisite for 4A: Completion of high school physics or equivalent, and credit or concurrent registration in Mathematics 50.
Prerequisites for 4 B : Physics 4 A with a grade of C or better and credit or concurrent registration in Mathematics 51.
Prerequisites for 4C: Physics 4 B with a grade of C or better and credit or concurrent registration in Mathematics 52.
Certain students may, with consent of the Department, substitute credit in Mathematics 22 for the indicated mathematics courses.
This course is designed to give a thorough understanding of the fundamental principles of physics in the areas of mechanics, wave motion, heat, electricity, and light.
5. Introductory Physics (4) I, I

Three lectures and three hours of laboratory.
Some of the more important phenomena and concepts in physics with practical illustrations and applications. Not open to students with credit for Physics 1A, 1B, $2 \mathrm{~A}, 2 \mathrm{~B}, 4 \mathrm{~A}, 4 \mathrm{~B}$, or 4 C .
50A-50B. Principles of Physics (6-6) I, II
Five lectures and discussions and three hours of laboratory.
Prerequisite for 50A: High school physics, or Physics 1A-1B or 2A-2B; credit or Preren Physics 4A.

Prerequisite for 50 B : Physics 50A with a grade of C or better, and credit or Prerequise for 50 B : Physics 50 A .
Mechanics, wave motion, heat, electricity, optics, and atomic and nuclear physics. The calculus will be used.
73. Introductory Electronics (3) I, II

Prerequisites: Physics $4 \mathrm{~B}, 50 \mathrm{~B}$, or 1 B ; or 2 B and 3 B ; a working knowledge of the calculus.
A qualitative study of electron tubes and electronic systems. Not open to students ith credit in Physics 103.

100A-100B. Classical Physics (3-3) I, II
Prerequisites: Physics 4C or 50B, and credit or concurrent registration in MathePrics 118A. Physics 100A is prerequisite to 100B.
Semester I: Newtonian mechanics and wave motion. Semester II: Electrostatics and magnetostatics.

## 02A-102B. Modern Physics (3-3) I,

Prerequisite: Physics 4C or 50B. Physics 102A is prerequisite to 102 B
Semester I: atomic and molecular physics, solid state physics, atomic spectrosSemester I: atoductory quantum mechanics. Semester II: kinetic theory, classical and quantum statistics, and thermal radiation.
103. Basic Electronics (3) I, II

Prerequisites: Physics 4 B or 50 B or 1 B , or 2 B and 3 B , and a working knowledge of the calculus.
A qualitative study of electron tubes and electronic systems. Not open to students with credit in Physics 73.

## 106. Optics (3) il

Prerequisites: Physics 4 C or 50 B or 1 B , or Physics 2 B and 3 B , and a working knowledge of the calculus.
Reflection, refraction, dispersion, interference, diffraction, double refraction and Reflection, refraction, spectra and the nature of light.
107. Optical Design (3)

Prerequisite: Physics 4C or 50B.
Ray tracing, aberrations, matrix methods, optical instrumentation.

## 110. Electricity and Magnetism (3) I, I

Prerequisites: Physics 4C or 50B; and credit or concurrent registration in Mathematics 118A, and in Physics 73 or 103 .
Analysis of direct and alternating current circuits using the operator " $j$ " and circuit theorems; introduction to coupled circuits, resonance and transients. Elecmagnetism, and magnetic properties.

## 111. Concepts in Modern Physics (3) I, II

Prerequisite: Physics 1B, 2B, or 5.
Modern developments in physics for non-physics majors, including relativity, introductory quantum theory, and atomic nuclear and solid state physics.

## 114. Acoustics (3) I

Prerequisites: Physics 73 and 100B.
Wave motion and its application to the production, transmission and reception of sound. Development of acoustic circuits using electro-acoustic analogs.

## 120A-120B. Advanced Physical Measurements (2-2) I, II

Six hours of laboratory.
Prerequisites: Physics 4 C or 50B; and credit or concurrent registration in Physics

or Physics 103. A year course
all the major areas of physics.

## 121. Radiation Physies (3)

Two lectures and three hours of laboratory.
Prerequisites: Physics 1B or 2B, and 3B.
X-rays, radioactivity, interactions of radiations with matter, and methods of
measurement. May not be used in the physics major. and

## 122. Senior Physics Laboratory (2) 1, II

## Six hours of laboratory.

Prerequisite: Physics 120B.
Advanced experimental measurements in the fields of classical and modern dynamics, advanced following areas: acoustics, nuclear physics, heat and thermostate physics, and analog computers, Coctrity and magnetism, microwaves, solid may be taken with consent of the instructor. May be repeated with one semester to a maximum of four units.
130. Physics for Elementary Teachers (3) I

Basic concepts, methods, and materials of physics for the elementary school Topics in classical and modern physics. Open only to elementary teachers and elementary teacher candidates. Not open to students with credit in Physics
$4 \mathrm{~A}-4 \mathrm{~B}-4 \mathrm{C}$ or $50 \mathrm{~A}-50 \mathrm{~B}$.

## 133. Concepts of Physics (4) I

Three lectures and three hours of laboratory.
Prerequisites: Mathematics 51 or Mathematics 22, and Physics 1 B or 2 B and 3 B with grades of C or better.
Unifying concepts of physics; conservation of momentum and energy, waveparticle models, conservative fields, relativity, and statistical physics.

## 135A-135B. PSSC Physics (3-3)

Two lectures and discussions and three hours of laboratory.
Prerequisites: Physics 1 B or 2 B , and 3 B .
A new approach to the study of major concepts of physics. Designed for those who plan to teach science. The course is based on test and laboratory materials prepared by the Physical Science Study Committee.
148. Nuclear Physics Laboratory (3) II

One lecture and six hours of laboratory.
Prerequisite: Physics 120B.
Techniques and instrumentation for the detection, identification and measurement of the properties of nuclear radiations and particles, and their use in the study of nuclear reactions.

## 151. Nuclear Physics (3) I, I

Prerequisite: Physics 190.
Nuclear phenomena, theory of the nucleus, cosmic rays, and high-energy reactions of particles.

## 155. Analog Computers (3) II

Prerequisites: Mathematics 118B; Physics 73 or 103.
Electronic integration and differentiation; solution of differential equations; multiplication, division and function generation; simulation of mechanical systems varying with time, solution of typical problems; auxiliary equipment, layout of large installations.

## 156. Digital Computers (3) I

Prerequisites: Mathematics 7 and 118B; Physics 73 or 103.
The binary number system; electronic and magnetic flip-flop circuits; memory devices; programming; complete computer systems. Auxiliary equipment for inserting information and reading out results rapidly. Typical applications and limitations.

## 160. Circuit Analysis (3) II

Prerequisite: Physics 73 or 103.
Filter design, transmission lines, and network analysis.

## 163. Electronics Laboratory (2) I

Six hours of laboratory.
Prerequisites: Physics 120B and credit or concurrent registration in Physics 173A.
Transisior characteristics, cathode ray oscillograph. One stage RC amplifier. One stage and multistage amplifiers including feedback. Equivalent circuits.

## 67A. Semiconductor Devices (3) I

Prerequisite: Phys transistor mechanisms, equivalent circuits and applications, thermal stability, switching theory and applications.

## 67B. Semiconductor Devices (3) in

Prerequisites: Physics 102A and 167A
Field effect devices, semiconductor lasers and photo detectors, four layer devices including SCR's, tunnel diodes, varactors and other microwave devices, thermoelectricity, Hall effect.

## 170. Electromagnetic Theory (3) $\mathbf{1}$, II

Prerequisites: Mathematics 118B and Physics 100B and 102B.
Electrostatics and magnetostatics treated by vector methods; Maxwell's equations. electromagnetic induction, radiation and wave propagation.

173A. Physical Electronics (3)
Prerequisites: Mathematics 118B and Physics 100B and 102B.
Conductors, Fermi model, thermionic, photoelectric, and field emission, contact potentials, space charge. Semiconductors, linear equivalent, circuits, elements of requency and time domain analysis, linear feedback circuits.

## 1738. Physical Electronics (3) II

Prerequisites: Physics 160 and 173A, each with a minimum grade of C and credi or concurrent registration in Physics 163.
Field approach to transmission lines, coaxial cables, wave guides, resonant cavities, stub matching, radiation and antenna phenomena, interaction of fields and electronic beams and power extraction from fields.

## 75. Advanced Mechanics (3) I

Prerequisites: Mathematics 118B and Physics 100B.
Special theory of relativity, generalized coordinates, Lagrangian and Hamilconian formulations, normal coordinates, theory of vibrations, and introduction to continuum mechanics

## 80. Solid State Physics (3) II

Prerequisites: Mathematics 118B and Physics 100B and 102B.
Elastic, thermal, electric, magnetic and optical properties of solids. Introduction to the energy band theory of solids, with applications to dielectrics, semi-conduc-

## 6. Modern Optics (3)

Prerequisites: Mathematics 118B, Physics 100B and 102B
Optics of solids, coherence and partial coherence theory, Fourier optics, holography.
187. Modern Optics Laboratory (2) I, I

Six hours of laboratory
Prerequisite: Credit or concurrent registration in Physics 186.
Experiments in various fields of modern optics such as holography, Fourier spectroscopy, spatial filtering, non-linear effects, and coherence measurements.
190. Introductory Quantum Mechanics (3) I, II

Prerequisites: Mathematics 118B, Physics 100B and 102B,
The physical basis of the quantum theory and its mathematical formulation in terms of Schroedinger's wave equation.

## 196. Advanced Physics (2 or 3)

Prerequisite: Consent of instructor
Selected topics in classical and modern physics. May be repeated with the

## 198A. Senior Research (1) I, I

One discussion period and two additional hours per week to be arranged.
Prerequisite: Senior standing in physics and an acceptable plan for graduation
within one year.
Selection and design of individual research project. Oral and written progres
1988. Senior Research (2) I, II

Two discussion periods and four additional hours per week to be arranged.
Prerequisite: Physics 198A with grade of C or better
Laboratory work, progress reports, oral and written final reports

## 00. Seminar (2 or 3)

205. Theoretical Mechanics (3)

210A-2108. Mathematics of Physics (3-3)

Physics
214. Advanced Acoustics (2)
219. Statistical Mechanics (3)
220. Radiation Physies (2)
221. Radiological Physics (2)
222. Health Physics (2)
248. Advanced Nuclear Physics Laboratory (3)
251. Nuclear Physics (3)
260. Advanced Electronics (3)

270A-270B. Electromagnetic Theory (3-3)
275A-275B. Quantum Mechanics (3-3)
280. Theory of the Solid State (3)
286. Advanced Optics (3)
297. Research (1-3)
298. Special Study (1-3)
299. Thesis (3)

## Political Science <br> In the College of Arts and Letters

## Faculty

Professors: Andrain, Gripp (Chairman), Feierabend, I., Generales, Janssen, Joy, Kahng, Padgett
Associate Professors: Crain, Hobbs, Johns, D., Miles, Nesvold, Schultze
Assistant Professors: Anderson, D. G.,. Byrne, Conniff, Cutter, Funston, Guertner, Jutkowitz, Keiser, Lewin, Moe, R., Pedersen, Pollock, Terrell
Visiting Lecturer: Soule

## Offered by the Department

Master of Arts in political science.
Major in political science with the A.B. degree in liberal arts and sciences.
Minor in political science.
Teaching minor in positical science with specialization in secondary teaching.

## Major with the A.B. in Liberal Arts and Sciences

A minor is required, chosen with the guidance of the chairman of Political Science.

Preparation for the major. Political Science 1, 2, 3, and three units of statistics. Major. Twenty-four upper division units, to include Political Science 128 or 197 and course must be in political theory of the six groups of courses listed. At least

## Minor

The minor consists of 15 units of political science, to include Political Science 1 , and 2 or 3 , and nine upper division units.

## Minor for the Standard Teaching Credential

The minor for secondary teaching consists of 20 units in political science, 14 of which must be in upper division courses chosen with the guidance of the de-

## 1. Introduction to Political Science (3) I, II

Basic concepts of political science including an introduction to the scope of the materials drawn primarily from the American experience knowledge. Illustrative Completion of both Political Science 1 and 2 will
ican Institutions.
2. Infroduction to American Government and Politics (3) I, II

The origin and development, structure and operation of the government of the United States, national, state. and local.
Completion of both Political Science 1 and 2 will meet all requirements in Amerand California government.
3. Introduction to Comparative Government (3) I, II

Analytical models and techniques for examination of the problems of decisionmakion in various cultural contexts.

## Research Methods (Group 1)

100A-100B. Research Methods in Political Science (3-3)
Prerequisite: Political Science 1, 2, and a three unit course in statistics. Political Science 100 A is a prerequisite to Political Science 100B
The research process, from research design through data processing, analysis intatics, census data, rollall records, sample survey data, and biographical information.

## Political Theory (Group II)

105. American Politieal Thought (3) I, II

The development of American ideas concerning political authority from the period of colonial foundation to the present time.

## 111A-111B. Theory of the State (3-3)

Prerequisite: Political Science 111 A is prerequisite to 111 B .
The nature of the State, its organization and activities, and its relation to the individual and other states

## 112. Modern Political Thought (3) I, II

Concepts concerning the nature of the state from Burke to the present.
113. The Theory of Political Inquiry (3)

Prerequisite: Political Science 1, 2, and 3.
Philosophical bases of science with reference to political science. Concepts, concept formation, theory building, and verification.
114. Problems in Political Theory (3)

Prerequisite: Six units of upper division political theory.
Research methods in political theory; intensive development of selected issues.

## Politics (Group III)

115. American Institutions (3) I,

The principles of the Constitution of the United States of America, and a survey of the political and social institutions which have developed under the Constitution. Meets the graduation requirement in the United States Constitution and California state and local government. When taken with Political Science American history, inAdministration 142 or 143 . stitutions, and ideal

## 16. American National Government (3) I, II

Prerequisite: Political Science 2 or 115, or History 17A and 17B.
An intensive examination of the primary institutions of the national government. ritic amaly relationships among the institutions of president, congress, and the judiciary.
17. Stafe and Local Governmem (3) within the context of statewide politics, stateA study of public policy-making widing both official and unofficial institutions. Emphasis on California. Meets the graduation requirement in California Government. (Formerly numbered and entitled: Political Science 142, State Government; ment Political Science 143, Municipal and County Government.)

## 18. Urban Politics (3)

Prerequisite: Political Science 1 or 2.
The processes by which social conflicts in American urban areas are represented and regulated. Urban political culture; ecology; group development and activity; power structures; and reform movements are surveyed. The characterly numarban political and entitled: Political Science 148, Government and Politics of Metropolitan Areas.)
119. Community Political Behavior (3)

Prerequisite: Political Science 1 or 2.
The studies of structure of community power are summarized and critically evaluated. The issues of community conflict are treated both by case study and comparative methods. Examples are drawn primarily from American-urban experience. (Formerly numbered Political Science 150.)

## 120. Political Parties (3) I, II

A critical analysis of the political party as a part of the process of government; party organization and activities; nominating and campaign methods; theories and functions of the party system; party responsibility. The function of the two-party
system in American government.

## 21. Political Behavior (3)

Prerequisite: Political Science 1.
Social and attitudinal variables in political behavior. Quantitative research data as used in electoral studies. (Formerly numbered Political Science 124.)

## 122. Political Communieation (3)

Prerequisites: Political Science 121
Communication as a political process; the effects of political communications on individuals and groups.

## 123-S. Contemporary American Politics (3) S

A consideration of a selected group of current major political problems in terms of their possible future implications and of their relationship to established Ameri-
can democratic principles and ideals.

## 124. The American Presidency (3) I, II

Prerequisites: Political Science 1 and 2.
Analysis of principal institutions, functions, and problems of the presidency and tive-legislative relations, and policy formation presidential leadership, staffing, execu-

## 125. The Legislative Process (3) I, II

A detailed analysis of legislatures. Special attention will be devoted to the impact of dynamic factors on formal procedures.

## 126. Political Groups and Movements (3) I, I

Prerequisite: Political Science 1 or 2.
Pressure group activity, lobbies, mass movements; factors which explain origin and motivations of group behavior; votes, money, information, protest as political politics.
128. Internship in Politics (2-6) I, II, S

Prerequisites: Political Science 120 and consent of instructor.
Students will be assigned selectively to functional areas of politics, such a political party headquarters, elective public offices and non-partisan political groups Participation will include project and internship conferences
129. The Politics of Bureaucracy (3) I, II

Prerequisites: Political Science 1 and 2.
An analysis of the bureaucracy as an actor in the political system.
130. Government and Public Policy (3)

Prerequisite: Political Science 116 or 117
Theory and practice of process of formulating public policy, roles of administrators, legislators, courts, interest groups, and political parties; public agencies and public interest, case studies in formulating public policies. (Formerly num-
bered Political Science 147.)
132. Minority Political Thought and Politics in the United States (3) $\mathbf{1}$, II

Political attitudes, behavior, and thought of selected minority groups.

## Public Law (Group IV)

135. The Supreme Court and Contemporary Issues (3)

Recent decisions of the Supreme Court of the United States and their relationship to contemporary political and social issues. Not open to students with credit in Political Science 139A or 139B.
138. Law and the Political System (3)

Forces influencing the making of law; relationship between social and legal change; nature and limits of the judicial function.

139A-139B. American Constitutional Law (3-3)
Prerequisite: Political Science 139A is prerequisite to 139B.
Principles of American Constitutional law. Includes judicial review, the federal Phers the nature of selected Congressional powers, and system, the separacted by the constitution against national and state action. Meets the graduation requirement in the United States Constitution.

## International Relations (Group V)

165. Dynamies of Modern International Crises (3) I, II

Prerequisite: Consent of instructor.
The determination and analysis of facts surrounding international crises since World War II; the evaluation of these crises and their effects upon external policies of the United States and the operations of the United Nations.

## 68-5, Institute on World Affairs (3) s

Contemporary problems in international relations. May be repeated once for Contemporary problems in international

70A-170B. International Relations (3-3)
A historical and analytical consideration of the basic factors-historic, geographic, eonomic, ideologic, and strategic-which underlie and condition the modern conOrigins and development through the nineteenth century. Spring semester: Twenieth century experimentation and conflict.
171. The Conduct of American Foreign Relations (3)

The legal, administrative, and political organizations by which American foreign policies are formulated and implemented.
172. International Organization (3) I

The organization by which the international community seeks to provide for the exercise of legislative, administrative and judicial functions on the international evel: diplomatic and consular corps; conferences; administration through commissions and unions; amicable procedures for settlement of disputes of Nations-United Nations experiment.

## 173. Principles of International Law (3)

The function of law in the international community. The historical development The function of lules of international law and their place in the modern diplomatic of legal structure.
174. National Security Policy (3)

Objectives, instruments, and consequences of national security policy
175. internarion The foreign policies of the Latin American states; the Unged States.
176. International Relations of the Developing Nations (3)

Prerequisite: Six units of political science.
Cooperation and conflict between the developing nations and relations of such nations with the developed countries.
177. Comparative Foreign Policies (3)

Prerequisite: Six units of political science.
Comparison of foreign policies of nations in various regional, socio-economic, and ideological areas.

Comparative Government (Group VI)
180. Government of England (3)

The structure and functioning of the English parliamentary system with emphasis upon present day political principles and parties.
181. Government of the Soviet Union (3) I

Theory and practice of government in the Soviet Union, with some attention to foreign affairs.
182. Political Violence (3)

Prerequisite: Political Science 1, 2, or 3.
Underlying conditions, expressions, and consequences of violence within political systems.
183. Governments and Politics of South and Southeast Asia (3)

The internal political systems and foreign policies of India, Pakistan, Thailand, and Indochinese area, Indonesia, and the Philippines.

## 184. The Mexican Political System (3)

Prerequisite: Political Science 1 or 3.
Principal factors in Mexican governmental decision-making. Ideology, political groups, tactics of leaders and governmental structure.
185. Governments of Continental Europe (3) I, II

The political systems of the countries of western continental Europe.
186. Comparative Communist Governments (3) I, II

The interrelations between the theory and practice of modern communism as found in representative communist systems.
187. Governments and Politics of the Far East (3)

The internal political structure and foreign policies of China, Japan, and Korea.
188. Governments and Politics of the African States (3) I

Domestic and international politics of specific African states.

## 189. Government and Politics of the Middie East (3)

The governmental and political structures of representative states in the Middle East, including Turkey, Israel, and the Arab states.
190. Comparative Political Systems (3) I, II

Prerequisite: Political Science 3.
An examination of selected political and governmental systems for purposes of comparative study and analysis to determine similarities, differences, and general patterns and universals among political systems.
191. Governments and Politics of the Developing Areas (3) I, II

Prerequisite: Political Science 1 or 3 .
Internal political systems, governmental structures, and the foreign policies of developing nations.

## 92. Political Change in Contemporary Africa (3) II

General pattern of nationalism in Africa south of the Sahara. Theories of social change and general features of contemporary African political development.

## Portuguese

193. Proseminar in Cross-National Studies (3)

Prerequisites: Political Science 3 and Political Science 100A
Cross-national analysis of institutional norms, attitudes, and behavior in relation to government; factors which determine patterns and styles of political participation in contemporary societies.
194. Political Change in Latin America (3)

Prerequisite: Political Science 1 or 3.
General pattern of politics and political development in Latin America with an emphasis on those features which condition domestic and foreign policy-making
195. Political Systems of Latin America (3)

Prerequisite: Political Science 194.
Domestic and international politics of selected Latin American states
196-5. Institute of Public Affairs (1-3) S
Study of selected phases of American or Comparative Government. May be repeated to a maximum of six units of course credit with new content and consent of instructor.
197. Investigation and Report (3) I, in

Analysis of special topics. Admission by permission of instructor.
200. Seminar in the Scope and Method of Political Science (3)
210. Seminar in Political Theory (3)
215. Seminar in American National Government (3)
220. Seminar in Politics (3)
221. Seminar in Political Participation (3)
225. Seminar in the Legislative Process (3)
226. Seminar in Political Psychology (3)
230. Seminar in Public Law (3)
250. Seminar in Local Government (3)
255. Seminar in Metropolitan Government and Politics (3)
270. Seminar in International Relations (3)
272. Seminar in International Organization (3)
275. Seminar in Theories of International Relations (3)
280. Seminar in General Comparative Political Systems (3)
281. Seminar in Western Political Systems (3)
282. Seminar in the Political Systems of the Developing Nations (3)
283. Seminar in Latin American Political Systems (3)
284. Seminar in Communist Political Systems (3)
290. Bibliography (1)
291. Problem Analysis (3)
297. Research in Political Science (3)
298. Special Study (1-3)
299. Thesis (3)

Portuguese
See Spanish and Portuguese.

## Psychology <br> In the College of Sciences

Faculty
Emeritus: Carlson, Kidwell, McCollom, Steinmetz, Treat
Professors: Alf, Dicken, Feierabend, R., Gallo, Grossberg, Harrison, R., Hillix, mannichs, Radlow, Rumbaugh, Stevens, Turner, M. B, Voek
Associate Professors: Gilbreath, Harari, Koppman, Leckart, Levine, Linton, Lynn, McDonald, R., Parker, Psomas, Rodin, Sand, Sattler, Schulte, Sheposh, Smith, J. R.
Assistant Professors: Bowen, Bryson, Defran, Franzini, Graf, Gunderson, Hornbeck, Hufford, Jacobson, McCordick, Mollenauer, Ohnesorge, Plotnik, Pollack, Richards, Schulman, Tilker, Yaremko

## Offered by the Department

Master of Arts degree in psychology; and a Master of Science degree in psychology.
Major in psychology with the A.B. degree in liberal arts and sciences.
Major in psychology with the A.B. degree in applied arts and sciences for students admitted to Secondary Teacher Education.
Teaching major in psychology with specialization in secondary teaching.
Minor in psychology.
Teaching minor in psychology with specialization in both elementary and second ary teaching.

## Major

With the A.B. Degree in Liberal Arts and Sciences
Two plans are provided for the major in psychology: Plan A for those students who wish to extend their liberal arts education in the field of psychology; and Plan B for those students expecting to pursue the stady of psychology beyond the A.B. degree.

## Plan A

Plan A is for a nonprofessional major in psychology and is designed to provide the student with a greater understanding of human behavior as the emphasis in his liberal arts education. The recommended pattern of courses for this progran is not designed to facilitate graduate and professional study in psychology.
Preparation for the maior. Psychology 40 and 50 . Recommended courses in six units in anthropology and/or sociology.

- Major. A minimum of 24 upper division units in psychology to include Psychol ogy 106, 131, 145, and 150. It is expected that each student under Plan A will select with the assistance of his adviser, a pattern of courses in line with his particular
bjectives in pursuing Man A.
To facilitate the purpose of Plan A the following courses in other departments home economics.


## Plan B

The purpose of Plan $B$ is to facilitate the specific preparation of those students who wish to pursue graduate and professional preparation in clinical, industrial and personnel, social, and theoretical-experimental psychology
Preparation for the major. Psychology 40,50, and 70. Recommended courses in six units in anthropology and/or sociology. A 124 ur er dios.
Major. A minimum of 24 upper division units in psychology to include Psychol 118; and ten units selected from courses in consultation with $115,116,117$, o 118, and ten units selected from courses in consultation with the departmental
adviser.

With the A.B. in Applied Arts and Sciences for Secondary Teaching Preparation for the major. Psychology 40, 50, and 70. Recommended: 15 units in anthropology, biology, philosophy, sociology, and zoology.
Major. Psychology 105, 110, 131, 151, and twelve additional units in psychology selected with approval of the departmental adviser.

## For the Standard Teaching Credential

The major in psychology for secondary teaching is the same as the undergraduate major for the A.B. degree in applied arts and sciences described above.
Postgraduate Year. Six units of postgraduate courses acceptable toward the credential.

## Minor

The minor consists of 15 units in psychology, nine of which must be upper division.

## Minor for the Standard Teaching Credential

The minor for elementary or secondary teaching consists of 21 units in psychology, to include Psychology 1, 106, 131, and 145.

1. General (3) I, II

Facts, principles, and concepts which are basic to understanding human behavior.
Prerequisite: Psychology 1.
Readings in great experiments from various fields of psychology to illustrate scientific method applied to human behavior. Lectures, demonstrations, and participation in classroom experiments to emphasize scientific method as a way of thinking. Designed as a general course for non-majors.

## 3. Psychology Laboratory (1) I, II

Three hours of laboratory.
Prerequisite: Psychology 1.
Application of experimental methods to psychological problems. Includes design and execution of experiments.

## 11. Applied Psychology (3) I, II

Prerequisite: Psychology 1.
The application of the basic principles of psychology to business, education, in dustry, government, law, medicine and related fields

## 12. Psychology of Individual Adjustment (3) 1

Prerequisite: Psychology 1.
An examination and interpretation of the factors which go into the making of Ae person as he adapts himself to the social world about him. The development of the normal personality.

Prerequisite: Psychology 1
The nature of psychological inquiry. Emphasis on principles and basic experimental data of learning and perception.
50. Introduction to Physiological Psychology (3) I, II

Prerequisite: Psychology 1.
Physiological mechanisms underlying the psychological phenomena of sensation, perception, emotion, motivation, learning and psychosomatic disorders.
70. Statistical Methods in Psychology (3) I, II

Prerequisites: Psychology 1 and Mathematics 3 or qualification on the MathePrerequisites: Psychology 1
matics Placement Examination.

Quantitative methods in psychology. Measures of central tendency and variability, graphic methods and percentiles, linear correlation, applications of the normal probability curve, chi-square, and an introduction to statistical inference. Not open to students with credit for, or concurrent enrollment in, another statistics course.
100. Selected Topics in Psychology (1-3)

Prerequisite: Six units of psychology.
An intensive study in specific areas of psychology, topic to be announced in

## 105. Psychological Testing (3) I, II

Prerequisite: One of the following courses: Psychology 70, Education 120, 151, or 152, or a semester of statistical methods in any other department.
the basic principles of testing. The selection and critical evaluation of group
106. Developmental Psychology (3) I, II

Prerequisite: Psychology 1.
The psychological development of the normal individual from conception through childhood, adolescence, maturity, and old age. Stress is laid upon the interdependence of the various periods of the individual's life.
107. Psychology of Later Maturity (3) II

Prerequisite: Psychology 1.
The psychological, physiological, and sociological factors influencing behavior in the later years of life.

## 108. Advanced Developmental Psychology (3) I, II

Prerequisite: Psychology 106.
Selected topics in the areas of infancy, childhood and adolescence.
109. Mental Deficiency (3) I, II

Prerequisite: One of the following: Psychology 106, Education 110, 112, 113, or equivalents.
The nature and causes of mental retardation, including the psychological effects of brain injury. Characteristics of the mentally defective.
110. Introduction to Experimental Psychology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Psychology 40 and 70.
Understanding of experimental design, quantitative methods, and experimental reports as they are applied to all areas of psychology.
111. Experimental Psychology: Perception (4)

Two lectures and six hours of laboratory.
Prerequisite: Psychology 110.
Experimental literature, assigned and original laboratory projects in the field of perception.
112. Experimental Psychology: Social (4) I, II

Two lectures and six hours of laboratory.
Prerequisite: Psychology 110.
Experimental literature, assigned and original laboratory projects in the field
social psychology. of social psychology.

## 13. Experimental Psychology: Physiological (4)

Two lectures and six hours of laboratory.
Prerequisites: Psychology 50 or 142 or six units of biology; and Psychology 110. Experimental literature, assigned and original laboratory projects in the field Experimental literature, assigned and original laboratory projects in the field search in brain mechanisms and behavior; includes basic electronics for biological scientists.
114. Experimental Psychology: Comparative (4) I, II

Two lectures and six hours of laboratory.
Prerequisite: Psychology 110.
Experimental literature, assigned and original laboratory projects in the field of comparative psychology.
115. Experimental Psychology: Personality and Clinical (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Psychology 110 and 150.
Experimental and theoretical literature, assigned and original laboratory projects in the field of personality and clinical psychology.

## 116. Experimental Psychology: Learning (4)

Two lectures and six hours of laboratory.
Prerequisite: Psychology 110.
Experimental literature, assigned and original laboratory projects in the field of earning.
117. Experimental Psychology: Primate Behavior (4) I, II

Two lectures and six hours of laboratory.
Prerequisite: Psychology 110.
Experimental literature, assigned and original observational and experimental Experimental field of primate learning and behavior.

## 118. Experimental Psychology: Child Development (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Psychology 106 and 110.
Methods, techniques and principles used in the scientific study of child behavior.
120. Consumer Psychology (3) I, II

Prerequisite: Six units of psychology.
A review of the research literature and methods relevant to the individual as a A review or our society. Attitudes, values, and decision making abilities of people when functioning as a consumer.

## 121. Personnel and Industrial Psychology (3) I, II

Prerequisite: Psychology 70 or statistics in another field.
Prerequisice: Principles applied to industrial problems of selection, placement, Psychological principles applied to industrial pro

## 122. Public Opinion Measurement (3)

122. Pame course as Journalism 122)

The history, methods, and problems of public opinion and attitude measurement. The history, methods, and proble polling of consumers and voters. Students will be Emphasis wiil beren field experience.

## 123. Organizational Psychology (3) I, II

Prerequisite: Six units of psychology.
Phe interplay of men and organizations. Psychological literature of the individual The interplay of to work, working in groups, industrial organizations, communications and conflict in industrial organizations.
124. Engineering Psychology (3) I, II

Prerequisite: Psychology 1.
Psychological problems of man-machine systems. Visual, auditory, and other sensory factors involved in the interrelations between man and machines. Survey of origin and basic data of engineering psychology.
125. Human Factors Psychology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Psychology 1 and consent of instructor.
Experimental techniques and procedures in the application of synthesis of behavioral criteria to the design, development, operation and maintenance of man machine systems. Government and industry job requirements, routines and prac tices.
131. Psychology of Personality (3) I, II

Prerequisite: Six units of psychology.
The principles of personality and their application to problems of adaptation and mental hygiene

## 133. Principles of Interviewing (3)

Prerequisite: Six units of psychology. Recommended: Psychology 12 or 131
Psychological factors in interviewing; interviewing techniques. Supervised practice in interviewing for purposes of personnel appraisal and development.

## 141. Neural Bases of Behavior (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Psychology 50 or six units in the biological sciences.
Elements of neurology and psychobiology with emphasis on sensory, central and motor mechanisms.

## 142. Physiological Psychology (3) I, I

Prerequisites: Psychology 40 and 50 and three units of biology; or nine units of biology.
An evolutionary approach to the development of complex behavior in highe organisms and man. The neurophysiology of emotion, sleep, bodily needs, instinc tive patterns of behavior, and of learning; brain and behavior disorders

## 145. Social Psychology (3) I, II

Prerequisite: Psychology 1.
The major problems and findings concerning group behavior and group member ship, the socialization of the individual, and processes of social interaction. Not open to students with credit in Sociology 140.
146. Advanced Topics in Social Psychology (3)

Prerequisites: Psychology 40 and 145.
An intensive exploration of selected areas within social psychology. Maximum credit six units with the approval of the instructor.

## 147. Psychology of Contemporary Social Problems (3)

Prerequisite: Psychology 1
Discussion of social issues and problems of importance to the contemporary
150. Abnormal Psychology (3) I, II

Prerequisite: Six units of psychology.
The causes, symptoms, and modification of behavior disorders with emphasis on neurosis, psychosis, and personality disorder.
151. Introduction to Clinical Psychology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Psychology 105 and 150.
History and current status of the profession; professional ethics and interprofessional concerns; clinical assessment and prediction; theory and practice of behavio change.
152. Introduction to Methods of Counseling (3) I, II

Two lectures and two hours of activity periods.
Prerequisites: Senior standing in psychology or presocial work, and consent of instructor.
An introduction to problems and methods of counseling and adjustment. The utilization of psychological principles and techniques in dealing with various types of guidance situations. Not open to students with credit in Psychology 233 or
53. Advanced Abnormal Psych

An intensive study and evaluation of research methodology and current literature
An intensive study and evaluation of research methodology and current literature
concerning the neuroses, psychoses, aphasias, ataxia, mental defect, and psychopharmacology.

167A-167B. Statistical Methods and Experimental Psychology (4-4)
Two lectures and six hours of laboratory.
Prerequisites: Psychology 40 and mathematical aptitude examination. (See Honors Program.)
Integrated approach to the understanding of statistical methods, experimental design and the writing of experimental reports as applied to all areas of psychology Not open to students with credit in Psychology 70 and 110.

## 179. Advanced Statistics (3) I, II

Prerequisite: Psychology 70.
A further study of quantitative methods in psychology with particular emphasis on methods of correlation, chi-square, and contingency, and an introduction to the analysis of variance.
71. Intermediate Correlational Analysis (3)

Prerequisite: Psychology 70.
Quantitative methods in psychology with emphasis on methods of correlation, multiple correlation, partial correlation, and factor analysis.

## 74. Theories of Perception (3) I, II

Prerequisite: Psychology 110.
Study of research and theory in the areas of sensation, perception, and atrention.
175. Theories of Learning (3) I, II

Prerequisites: Psychology 1, 40, and 70.
The facts, principles, and major theories of learning.

## 76. Principles and Practice of Personnel Training (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Psychology 121, 175, and consent of instructor.
Techniques and apparatus appropriate for training of personnel. Supervised practice in analyzing training needs, designating required terminal behavior, devising a raining technique, writing and validating a training aid

## 77. History of Psychology (3) I, I

Limited to psychology majors with senior standing.
The historical background of modern psychology
178. Theories of Personality (3) $\mathbf{I}, \mathbf{I I}$

Prerequisites: Major in psychology and six upper division units in psychology. Representative personality theories and supporting evidence.

## 179. Philosophical Issues in Psychology (3)

Prerequisite: Twelve units in psychology.
Modern empiricism and the philosophy of science as related to issues in contemporary psychology.

180-S. Contemporary Problems in Psychology (1) S
Lectures open to the public.
Enrollment for credit limited to upper division and graduate majors in psychology; or consent of instructor.
A series of six weekly lectures by visiting psychologists on subjects related to current research problems. Reading and reports required of students enrolled for credit.
197. Senior Project (1-3) I, II

Prerequisites: Twelve units in psychology and consent of instructor.
An individual investigation and report on a research project. Maximum credit six units.
200. Seminar (3)
201. Seminar (3)

202A-202B. Contemporary Psychology (3-3)
204. Psychological Assessment I (4)
205. Psychological Assessment II (4)
211. Behavior Disorders of Childhood and Adolescence (3)
212. Behavior Disorders of Adults (3)
219. Seminar in Personnel Psychology (3) Offered once a year
220. Seminar in Organizational Psychology (3)
221. Seminar in Problems in Social Psychology (3)
222. Seminar in Theoretical Psychology (3)
223. Experimental Design (3)
224. Advanced Experimental (3)
225. Principles of Test Construction (3)
226. Seminar in Political Psychology (3)
230. Seminar in Physiological Correlates of Behavior (3)
231. Seminar in Ethology and Comparative Psychology (3)
233. Counseling and Psychotherapy Laboratory (4)
270. Statistical Theory (3) I, II
275. Advanced Principles of Learning (3) I, II
277. Seminar in the History of Psychology (3) I, II
296. Directed Field Experience (1-3)
297. Research (1-3)
298. Special Study (1-3)
299. Thesis (3)

## Public Administration and Urban Studies <br> In the College of Professional Studies

Faculty
Professors: Bigger, Haak, Kitchen, Kochanski, Leiffer, Walker, D., Wilcox (Director)
Assistant Professors: Clapp, Closson, Gazell, Gitchoff, Hamilton, Walshok
Lecturer: Erikson
Offered by Public Administration and Urban Studies
Master of City Planning
Master of Public Administration.
Master of Science in criminal justice administration.
Major in criminal justice administration; with the B.S. in applied arts and sciences.
Major in public administration, with the A.B. in applied arts and sciences.

## Criminal Justice Administration Major

## With the B.S. Degree in Applied Arts and Sciences

Preparation for the major. Political Science 2, Sociology 1, and a lower division course in statistics. Students who plan to enter police work are strongly dvised at institution offering work in this field
ience at an institution ofering work in this field.
Major. A minimum of 36 upper division units to include Political Science 105, Public Administration 140, and 197 or 198; six units selected from Public Adminisration 116, Sociology 110, 113, 114, 123, 125, 140, 157; and twenty-one additional Administration $110,111,112,116,141,143,144,146,147$, 148 Science 122, Public 180; Psychology 106, 150.

## Public Administration Major

## With the A.B. in Applied Arts and Sciences

Preparation for the major. Economics 1A-1B, Political Science 2, and a 3-unit course in statistics (may be taken in upper division).
Major. Thirty-six upper division units to include Public Administration 140 and 198; Economics 131 or Public Administration 162; and additional upper division courses selected with approval of the departmental adviser, including a three-unit course in statistics if not taken in the lower division. Within this program, students may elect to specialize in urban management. Interested students should seek guidance from the director.

## Public Administration Minor

The minor consists of 15 units to include Political Science 2, Public Administration 140, and Public Administration 197, 198, or other courses selected with the guidance of an adviser in public administration.

## Certificate in Public Administration

This certificate is designed primarily for persons who hold administrative or managerial positions or for those who seek to prepare for such responsibilities. Previous academic experience is not a prerequisite; nor need the program be accompanied by work toward a degree. Candidacy will be established by the director of the program. The awarding of the certificate requires completion of an approved pattern of eight courses with a minimum grade point average of 2.5 (C+).
For further information, consult the director, Public Administration Certificate Program.

The department's undergraduate courses fall into three main areas:
(1) Criminal justice. Most relevant are courses numbered 110, 111, 112, 116, 146, and 188.
(2) Public administration. Most relevant are those numbered 136, 140, 141, 142, $143,144,145,147,149,152,155$, and 156.
(3) Urban studies. Most relevant are those numbered 148, 150, 154, and 160.

## 90. The Urban Scene (3)

Urban society as an environment in which people interact with such public institutions as municipal and county administrations, school districts, and specia authorities; community control over institutions within the urban conglomerate
improving urban life styles. improving urban life styles.
110. Law Enforcement Administration (3)

Prerequisite: Sociology 1.
Administrative relationships within the criminal justice process with special reference to problems of courts and police and probation agencies.
111. Administration of Juvenile Justice (3)

Prerequisite: Sociology 114 or Public Administration 110 or 146.
Administration of programs for treatment of juvenile offenders by police, probation and courts.
112. The Administration of Criminal Law (3)

Prerequisite: Public Administration 110 or 146 or Political Science 135 or 139A. Basic concepts of the criminal law; elements of crime and the administrative
processes of law enforcement.

## 16. Contemporary Correctional Administration (3) II

Prerequisite: Sociology 113 or 114.
The problems encountered in administering modern correctional institutions, forestry and road camps, detention homes, and jails. (Formerly numbered Soci-
136. Administrative Law (3) II

The law of public office and public officers, powers of administrative authorities, scope and limits of administrative powers, remedies against administrative action.

## 140. Concepts and Issues in Public Administration (3)

Theory and practice of governmental administration in differing environments role of administrators in public policy; issues facing administrators, techniques of administration.

## 141. Studies in Public Administration (1-3) I, II

Offered only in Extension.
Analysis of selected administrative processes and problems of governmental agencies, their legal and political relations to other agencies and to the public. With consent of instructor, may be repeated with new content.

## 142. Management of State Governments (3) I, II

Administrative and constitutional problems of state management in the American federal system. Emphasis on California. When taken with Political Science 115 will also meet requirements in American history, institutions, and ideals, and in the U.S. Constitution.
143. Management of Urban Governments (3) I, II

Problems of local units of government in the urban environment. Organization and function of local agencies. Emphasis on California. When taken with Politica Science 115, will also meet requirements in American history, institutions, and
ideals, and in the U.S. Constitution.

## 144. Public Personnel Administration (3) I, II

Prerequisite: Consent of instructor.
Problems in recruitment, placement and supervision of public employees.

## 145. Administrative Behavior (3) I

Social, psychological, and behavioral theories of organization; concepts of administrative leadership; organization and the individual; emphasis on governmental organizations.

## 146. Administration of Justice (3) I, II

Prerequisite: Public Administration 140 or Political Science 138 or 139A.
Fundamental problems in judicial administration in law enforcement, organization and management, and issues in judicial reform and in public safety.

## 147. Administration and Public Policy Development (3) I, II

Process of formulating public policy with emphasis on the role of public agencies. Case studies.

## 48. The Metropolitan Area (3) I,

Prerequisite: Public Administration 142 or 143
Problems of government and administration arising from population patterns and physical and social structures of metropolitan areas.

## 149. Comparative Public Administration (3) II

Prerequisite: Public Administration 140.
Administrative organization and process selected foreign and American governments. Analysis of the cultural basis of administrative systems.
150. Decision-Making in the Urban Community (3) I, II

Prerequisite: Public Administration 143.
Processes of decision-making in the management of urban communities.

## 151. California Law of Municipal Corporations (3) I, II

Offered in Extension only.
California law governing the nature, regulation and control of the counties, charter cities, sixth class cities, school districts and special districts. The creation, alteration, dissolution, legal actions by and against, powers and duties; rights and liabilities of local governments.

## 152. Administrative Management (3) I, II

Areas and problems of administrative research; methods of analyzing structures and procedures in organizations; planning and administration of programs; design of forms; job classification and salary surveys; preparation of administrative reports.
153. Management of the Federal Government (3) I, I

Prerequisite: Public Administration 140.
Problems in the administration of the federal government: for example, leadership, specialization, unity of command, oversight.
154. Intergovernmental Relations in the United States (3) II

Prerequisite: Political Science 2.
Constitution, political and administrative characteristics of American federalism, including regionalism, interstate compacts, and grants-in-aid.

## 155. Regulatory Administration (3) I, I

Prerequisite: Public Administration 140 or 146 or Political Science 139A-139B. Fundamental structure, problems and criticisms of the regulatory systems in the United States.
156. Administrative Systems Analysis (3)

Two lectures and two hours of laboratory.
Prerequisites: Public Administration 140 and a statistics course.
Systems and organization analysis; survey of electronic systems; work standards and units; procedures analysis; administrative planning

## 157. Public Relations of Public Agencies (3)

Prerequisite: Public Administration 140.
Theory and practice of public relations in government. Public opinion and clientele groups in relation to administrative agencies. Problems in public relations of public agencies. Techniques of public relations.
160. Principles of Planning (3) I, II

An introduction to community planning: regional, county, and city. Consideration of the Master Plan, including its purposes, contents, and method of adoption.
161. Field Studies in Government (3) II, S

Prerequisite: Public Administration 140
Study of organization, policies and functions of selected government agencies. Discussion by responsible officers and inspection of work operations and facilities in management, public safety, public works and utilities, and other major governmental operations.
162. Fiscal and Budgetary Policy (3) I, II

Prerequisite: Public Administration 140.
Policies of fiscal administration and budgeting; political implications of the governmental budget process; revenue, debt, and treasury management; the functions of accounting and financial reporting.

## 188. Probation and Parole (3) I

Basic concepts, history, legislation, and practices used in work with juveniles and adults who have been placed on probation or parole; criteria of selection methods of supervision, and elements of case reporting. (Formerly numbered cial Welfare 188.)
197. Investigation and Report (3) I, II

Analysis of special topics. Admission by permission of instructor.
198. Internship in Public Administration (2-6) I, II

Prerequisite: Consent of instructor.
Students will be assigned to various government agencies and will work under oint supervision of agency heads and the course instructor. Participation in staff and internship conferences.
201. Scope and Method of Public Administration (3)
203. Seminar in Theory of Administrative Organization (3)
210. Seminar in the Administration of Criminal Justice (3)
216. Seminar in Correctional Administration (3)
230. Seminar in Public Financial Management (3)
240. Seminar in Public Administration (3)
241. Seminar in Public Personnel Administration (3)
242. Seminar in Public Administration in Developing Nations (3)
243. Science, Technology, and Public Policy (3)
245. Readings in Public Administration (3) I, II
249. Seminar in Comparative Administration (3)
250. Management of Urban Governments (3) I, II

Public Administration and Urban Studies
255. The Metropolitan Area (3) I, II
260. Administration and Public Policy Development (3)
291. Problem Analysis (3)
296. Internship in Public Administration (1-3)
297. Research in Public Administration (3)
298. Special Study (1-3)
299. Thesis (3)

## City Planning

CP 261. Urban Design and Land Use Planning Studio (6)
CP 262. History of Urban Planning (3)
CP 265. Seminar in Planning Administration (3)
CP 266A. Seminar in Urban Planning (3)
CP 266B. Seminar in Urban Planning Methodologies (3)
CP 266C. Seminar in Urban Planning Implementation (3)
CP 266D. Seminar in Urban Planning Theory (3)
CP 267. Readings in Urban Planning (3)
CP 296. Internship in Urban Planning (3-6)
CP 297. Research in Urban Planning (3)
CP 298. Special Study (1-3)

## Recreation

Faculty

## In the College of Professional Studies

Professor: Hanson, R.
Associate Professor: Butler, R. (Chairman)
Assistant Professor: Haffly

## Offered by the Department

Major in recreation administration with the A.B. degree in applied arts and
sciences.
Minor in recreation

## Recreation Administration Major

With the A.B. Degree in Applied Arts and Sciences
The major in recreation administration may be planned with an emphasis in one of the following four areas: (1) Leisure Agency Leadership, (2) Outdoor Recrea-
tion, (3) Park and Recreation tion, (3) Park and Recreation Management, or (4) Recreation Rehabilitation.

## Emphasis in Leisure Agency Leadership

Preparation for the maior. Music 2; Physical Education 32A, 33A, 33B; Psy-
chology 1; Recreation $40,60,70,80,84 ;$ Scion Major. Aecreation 40, $60,70,80,84$; Sociology 1 ( $231 / 2$ units)
maior. A minimum of 37 upper division units to include Health Science and
Safety 146; Industrial Arts 101; Journalism 180. Psy Sasery 184. Nine units selected from Psychol 180; Psychology 106; Recreation 140 , 125, 157. Eight units selected from Psychology 131, 145, 152; Sociology 113, 140 Arts 140; Physical Education 122, 151, 175, 176.

## Emphasis in Outdoor Recreation

Preparation for the major. Recreation 40, 60, 80; Biology 1 and 2; Geology
Geography 1; Botany 1; Economics 1A. Zolo Major. A minimum of 36 upper division Zoology 50. (27 units.)
185; Geography 170, 171, 175; Industrial Arts 101; Biologe Recreation 165, 175 selected from the following: Biology 110, 165. 101; Biology 115; and twelve units cal Science 117; Psychology 145; Zoology 114, 117, 135. ${ }^{\text {2 }}$, Journalism 180; Politi-

## Emphasis in Park and Recreation Management

Preparation for the major. Psychology 1; Recreation 40, 60, 70, 80, 84; Sociology
Four units selected from 1. Four units selected from Art 2A; Business Major. A minimum of 38 upper Communication 64 ( 23 units).
Major. A minimum of 38 upper division units to include Industrial Arts 101;
Journalism 180; Public Administration 140, 143; Recretion Journalism 180; Public Administration 140, 143; Recreation 140, 165
units selected from Psychology 106; Public Admis 184. Nine 125, 157. Six units selected from 106; Public Administration 144, 152; Sociology Nine 185.

## Emphasis in Recreation Rehabilitation

Preparation for the major. Psychology 1; Recreation 40, $60,70,80,84$; Sociology
and 1 ; and four units of electives from art, aquatics, business administ 84 ; Sociology Maior A minimum of
Maior. A minimum of 36 upper division units to include Indusial Journaism 180; Recreation 150, 151, 165, 184; Psychology 106, Industrial Arts 101 Sociology 114, 135, 136, ociology 114, 135, 136; Education 135, 167; Health Science and Safery 175, 176.

Recreation

## Minor

The minor consists of 15 units to include two lower division units in art, dance, drama, or music; Recreation $60,70,80,165$, and 184 ; and Drama 110 or Recreation 140. Recommended: Industrial Arts 101, Physical Education 151, 175, 176, Psychol ogy 106, Public Administration 144, and Recreation 150

## 40. Challenges of Leisure (3) I, II

Study of leisure and its impact on contemporary life; issues affecting recreation in today's urbanized society.
60. Introduction to Community Recreation (2) I, II

Scope of community recreation; basic philosophy of leisure time agencies; leader ship theory; organizations for youth; program planning; and playground practices

## 70. Peareation Leadership (3) I, II

Two lectures and three hours of laboratory.
Plan and conduct programs in social recreation, recreational dramatics, song leading, handicrafts and low-organized games. Principles of group leadership.

## 90. Camp Leadership (2) I, II

Consideration of camp administration and principles of good camp leadership. Lectures and practical sessions aimed at general training in all phases of outdoo education and camp leadership, including skills in axemanship, outdoor cooking, nature projects, camp crafts, campfire and special camp programs.
84. Supervised Field Work (3) I, II

Prerequisites: Credit or concurrent enrollment in Recreation 60 and 70.
Observation and participation in community recreation leadership. Practical, Observation and parion in tecreational settings. Minimum of one hour per week in class plus eight hours per week at an agency.
140. Conduct of Recreational Sports (2) I, II

Two lectures plus outside practical experience in the conduct of recreationa sports programs.
Organization of competition, community sports programs, administration of inOrgaral athletics, and techniques of officiating.
150. Recreation in Medical Settings (3) I, II

Recreation activities to meet the needs of handicapped confined to private, State Recreation arest centers. Designed for social welfare students, nurses, special aducation teachers, and medical recreators.
151. Practicum in Recreation for Special Groups

Two lectures and three hours of laboratory.
Prerequisite: Credit for or concurrent enrollment in Recreation 70
Developing community recreation programs for one of the following groups: and physically handicapped. May be repeated aging, mentiferent areas of exceptionality.

## 65. Ad initrution of Recreation Programs (3) I,

Prerequisite: Recreation 60.
Administrative authority and responsibility to plan, implement, finance, staff and Admistrative programs of recreation. The use of social and human resources.

## 175. Management of Recreation Areas and Facilities (3) II

Prerequisite: Credit for or concurrent registration in Recreation 165.
Role of the recreation administrator in the planning, acquisition, development, Rnancing, staffing and maintaining of recreational lands, waters, and structures. Use of natural and man-made resources in the environment.

## 184. Directed Leadership (3) I, II,

One lecture and eight hours of supervised activity
Prerequisite: Recreation 84.
Supervised leadership experience in public and private recreation agencies. May be repeated for a maximum of six units of credit.

## 185. Principles of Outdoor Recreation (3)

Prerequisite: Minimum of one summer work experience in a federal or state reational area.
Objectives and practices related to administration of recreational systems in lems; planning and operational techniques. crational techniques.
204. Problems in Recreation (3) (Alternate years)
205. Park Management (3) (Alternate years)
260. Recreation Administration and Supervision (3) (Alternate years)
261. Seminar in Specialized Facilities (3)

## Religious Studies

## In the College of Arts and Letters

## Faculty

Professor: Anderson, A.W
Associate Professor: Jordan (Chairman)
Assistant Professor: Khalil

## Offered by the Department

Major in religious studies with the A.B. degree in liberal arts and sciences. Minor in religious studies.

## Major with the A.B. Degree in Liberal Arts and Sciences

Preparation for the major. Religious Studies 20, 50, and Philosophy 1A-1B.
Major. A minimum of 24 upper division units in religious studies to include either Religious Studies 100A or 100B, at least six units from courses listed in Group I below, at least six units from Group II, at least three units from Group III, and at least three units from Group IV. Six of the 24 upper division units required fo the major may be taken from among those courses other than religious studies courses which are included in Group II and Group III below,
Group I: Religious Studies 110, 111A-111B, 114, 115, and 116.
Group II: Religious Studies 121A-121B, Philosophy 150A-150B.
Group III: Religious Studies 130, 132, Philosophy 135, Sociology 138, Anthropology 153.
Group IV: Religious Studies 190, 191.

## Minor

The minor in religious studies consists of from 15 to 22 units to include at least three lower division units in religious studies, at least three units from Group I, at
least three units from Group II, and at least three units from Group III.
Group I: Religious Studies 110, 111A-111B, 114, 115, 116.
Group II: Religious Studies 121A-121B, Philosophy 150A-150B.
Group III: Religious Studies 130, 132, Philosophy 135, Sociology 138, Anthropology 153.
Group IV: Religious Studies 190, 191.

## 20. World Religions (3)

Major figures, attitudes and teachings of world religions.

## 50. Problems of Religion (3)

Problems in the study of religions, based on the study of scripture selected from Fastern and Western religions.

## 100A-100B, The Bible (3-3)

Prerequisite: Three units of religious studies
The problems of composition and historical significance in the context of religious Thenings. First semester: the Pentateuch, the Prophets and the Writings. Second meanings. the New Testament.

## 110. Greek and Latin Fathers (3)

Prerequisite: Six units of religious studies.
Readings in patristic thought from Ignatius of Antioch through Augustine.

111A-111B. The Western Christian Tradition (3-3)
Prerequisite: Religious Studies 110, 111A is prerequisite to 111B.
Readings in source materials illustrative of the doctrinal and institutional development of the Western Church. First semester: the Medieval Church and early stage of the Reformation. Second semester: the Reformation and the Enlightenment.

## 14. The Eastern Orthodox Tradition (3)

Prerequisite: Religious Studies 110
Major doctrines, practices, and developments in the Eastern Church after the

## 15. Judaism (3)

Prerequisite: Three units of religious studies
Major trends and teachings from the Talmudic period to the present.

## 116. Islam (3)

Prerequisite: Three units of religious studies.
Major doctrines, practices, and developments from the time of Mohammed to the present.

## 21A-121B. Oriental Religions (3-3)

Prerequisite: Three units of religious studies.
Phenomenological studies in the major religious traditions of south and east Asia First semester: religions of India-especially Hinduism and Buddhism. Second semester: religions of the Far East.

## 126A-126B. Seriptures of India and China (3-3)

Formerly Philosophy 150A-150B, Asian Thought.
Prerequisite: Religious Studies 50, 121A, or 121B; or six units of philosophy.
The religious and philosophical modes of thought and ways of life of the Orient. Reading and analysis of primary texts in translation. Semester I: India and Southeast Asia. Semester II: China and Japan.
130. Theory and Practice of Worship (3)

The symbolic structure of devotional performance

## 131A-131B. Religion and Culture (3-3)

The relations between religion and aspects of major cultural traditions. First semester: primarily the plastic arts and music. Second semester: primarily literature
and drama.
132. Dynamics of Religious Experience (3)

Prerequisite: Six units in humanities or social sciences.
Chief data and major approaches in the study of individuals' religious behavior philosophical views of man. (Formerly numbered 125.) in world religions and

## 135. Religion and Science (3) I, II

Prerequisite: Religious Studies 20 or 50 .
A critical exploration of the relation of science to religious conceptions of human nature and destiny.

## 136. Religion and Relevance (3) I, II

Prerequisite: Religious Studies 100 A or 100 B
A critical exploration of the contemporary understanding of biblical religion in relationship to social action as exemplified in the writings of theologians and con-

## 140. The Oracular Tradition (3)

Prerequisites: Religious Studies 50; and 121A, 121B, 126A, 126B, 131A, or 131B Oracular traditions of East and West, with special attention to the 1 Ching and

## Religious Studies

## 180. A Major Figure (3) I,

Prerequisites: Religious Studies 20 or 50 , and three upper division units in religious studies
Life, works, and significance of one major figure in a religious tradition. May be repeated with new content. Maximum credit six units.

## 181. A Metaphysical Doctrine (3) I, It

Prerequisites: Philosophy 1B, Religious Studies 20, or 50 ; and three upper divi sion units in religious studies
Systematic study of a selected theme or problem basic to the teachings of one of the major religious traditions. May be repeated with new content. Maximum credit six units.
190. Advanced Studies in Religious Practices (3)

Prerequisite: Nine upper division units in religious studies including at least three units in Oriental traditions and three in Western traditons.
Research in the function and significance of ritual, prayer, and meditation.
191. Advanced Studies in Religious Doctrines (3)

Prerequisite: Nine upper division units in religious studies including at least three units in Oriental traditions and three in Western traditons.
Research in the significance of selected teachings of the major religions.
192. Recent Christianity (3)

Prerequisite. Religious Studies 111B; 114 is recommended.
Themes in the development of Christian institutions and doctrines in the 19th and 20th centuries.

## Russian

See German and Russian

## Social Welfare Social Work

See "School of Social Work" in the catalog section Professional Schools, Courses and Curricula.

## Sociology

## In the College of Arts and Letters

Faculty
Emeritus: Barnhart
Professors: Daniels, DeLora, J.R., Gillette (Chairman), Johnson, C.D., Kirby, Klapp, Milne, D.S., Mouratides, Wendling $\qquad$
Associate Professors: Chandler, El-Assal, Winslow
Assistant Professors: Baldock, C., Buck, Cottrell, A., DeLora, J.H., Drake, C., Emerick, Kennedy, Lally, Scheck, Schulze, Stephenson, J, Werner
Lecturer: Arfman

## Offered by the Department

Master of Arts degree in sociology.
Major in sociology with the A.B. degree in liberal arts and sciences. Minor in sociology.

## Major with the A.B. Degree in Liberal Arts and Sciences

Students majoring in sociology must complete a minor in another field.
Preparation for the major. Sociology 1, 10, and 60. (9 units.) Advanced students in junior and senior years entering the major may take Sociology 102 in place of Sociology 1, but may not use 102 to fulfill minimal upper division requirements
Maior A minimum
Major. A minimum of 24 upper division units in sociology to include Sociology
101,122 , and 140 .

## Sociology Minor

The minor in sociology consists of from 15 to 22 units in sociology, nine units

1. Introductory Sociology (3) I,

This course, or Sociology 102, is prerequisite to all upper division courses in ociology.
Development and use of the concepts applied to sociological analysis; the effects of isolation and social contacts, interaction, processes, forces, controls, collective ehavior, and social progress. Not open to students with credit in Sociology 102.

## 0. Contemporary Social Problems (3)

Prerequisite: Sociology 1.
Modern social problems recognizing the sociological factors involved. Emphasis on the scientific method of approach. An evaluation of various causes and solutions of problems. Not open to students with credit in Sociology 110 or Mexican-Ameri-
can Studies 10 .

## 35. Marriage and the Family (3) I, II

Analysis of dating, engagement, marriage and family relationships. The married couple as a small group viewed through contemporary sociological and social psychological principles and research findings. Factors predictive of marital behavior. Not open to students with credit in Home Economics 35 , Social Welfare 35, other course in marriage and the family, or in courtship and marriage.

## 60. Elementary Social Statistics (3) I, II

Prerequisites: Sociology 1 and Mathematics 3.
Analysis and presentation of elementary materials in the fields of sociology and social work. Tabular and graphic presentation, analysis of frequency distribution, with credit for, or concurrent enrollment in, another course in Not open to students

## Sociology

64. Sociological Analysis (3) I, II

Prerequisite: Sociology 1 or 102.
Development and use of fundamental procedures of sociological investigation.

## 100. History of Social Thought (3) I, II

Prerequisite: Sociology 1 or 102.
Development of social thought prior to the appearance of sociology as a distinct scientific discipline. Major emphasis on European contributions.
101. Classical Sociological Theory (3) I, II

Prerequisite: Sociology 1 or 102.
Theories of the major early European and American sociologists, including Marx, Weber, Durkheim, Pareto, Cooley, Mead, and others.

## 102. Principles of Sociology (3) I, II

Development and use of the concepts that are applied to sociological analysis. A more intensive introduction to sociology than given in Sociology 1. Not open to students with credit in Sociology 1. Sociology 102 may not be used to fulfill the
minimal upper division requirements in the socion major.
103. Contemporary Sociology Theory (3) I, I

Prerequisite: Sociology 101.
Types and trends of contemporary sociological theory. Selected theoretical
works.
104. Social Change (3) I, II

Prerequisite: Sociology 1 or 102
Social change at the interpersonal, institutional, and societal levels in a com parative perspective. Detailed analysis of modernization.

## 110. Social Disorganization (3) I, II

Prerequisite: Sociology 1 or 102
Survey of many alleged abnormal phenomena in society as seen in society today in various forms of individual, family, community and world disorganization, such as crime, prostitution, extreme alcoholism, migratory workers, divorce, revolution, war, etc.
111. Current Social Issues (3) I, II

Prerequisite: Sociology 1 or 102
Selected controversial and currently relevant social issues. Maximum opportunity provided for student initiative in determining course content and procedures.

## 112. Sociology of Conflict (3) I, II

Prerequisite: Sociology 1 or 102.
Conflict as a social process: background, forms and consequences at the interpersonal, intergroup, class, a and international levels from a sociological frame of
113. Criminology and Penology (3) I, II

Prerequisite: Sociology 1 or 102.
The extent and characteristics of crime; consideration of physical, mental, economic, and sociological causes of crime; study of methods of penal discipline, prison
114. Juvenile Delinquency (3) I, II

Prerequisite: Sociology 1 or 102.
The nature and extent of delinquency; the causative factors involved; methods of control and prevention, with special attention to the protective and remedia measures, probation and parole, and recreational agenices.
120. Industrial Sociology (3) I, II

Prerequisite: Sociology 1 or 102.
Group relationships within economic organizations. Problems of leadership, morale and conflict. Some attention to the sociology of occupations and professions.

## 121. Sociology of Occupations and Professions (3) I, II

Prerequisite: Sociology 1 or 102.
Division of labor, status ranking of occupations, authority structures, occupational and professional organization, occupational socialization, problems of identity
and role conflict.

## 122. Social Organization (3) I, II

Prerequisite: Sociology 1 or 102.
Major forms of social organization such as institutions, associations, bureaucracy, primary groups, and stratification. Study of underlying processes of development, social control and organizational change.
123. The Sociology of Mental Iliness (3) II

Prerequisite: Sociology 1 or 102.
The social definition, ecology, and control of mental illness across various soieties. The implications of social differentiation, stratification, and urbanization upon the incidence, prevalence, and control of mental illness and the use of
these empirical problems for sociological research

## gical research

24. Social Stratification (3) 1 , 1

Prerequisite: Sociology 1 or 102.
Theories of stratification in society; studies in the American stratification system Comparison with other selected societies.

## 125. Minority Group Relations (3) I, II

Prerequisite: Sociology 1 or 102.
Theories of ethnic prejudice. Analysis of racial and ethnic discrimination. Ana lytical inquiry into sources of friction and causes of conflict between majority

## 26. Medical Sociology (3) I

Prerequisite: Sociology 1 or 102.
A sociological analysis of health and medical institutions. Cultural factors in conceptions of disease, health, and healing. Social structure of medical facilities and the role of personnel in such institutions. Relation of illness to income, housing Sience 32. Formal Organization (3) I

Prerequisites: Sociology 1 or 102, and 122.
The structure and dynamics of various types of complex formal organizations. Their development, internal structure and processes, external relations and function
in contemporary society.
135. Dynamics of Family Development (3) II

Prerequisite: Sociology 1 or 102.
Analysis of the history of families; how they form, function, and grow to maturity. Focus on the development and interaction of family members throughout all stages of family life cycle from marriage to dissolution. (Not open to students with credit in another upper division course in marriage and the family.)

## 136. Sociology of the Family (3)

Prerequisite: Sociology 1 or 102. Recommended: Sociology 101 and 146.
A comparative study of family systems in different societies. Changing rolestructure and functions of the modern family; rural-urban, social class racesystem of interpersonal relationships.
137. Political Sociology (3) I

Prerequisites: Sociology 1 and 122.
Social organization of political processes. Power and authority, social class, primary groups, collective behavior, social change, and other sociological factors considered in their relationships to political processes.
138. Sociology of Religion (3) II

Prerequisite: Sociology 1 or 102. Recommended: Sociology 101 and 146.
The role of religion in society as cult and institution, including primitive religion, modern sects and churches, ritual, secularization, and religious movements.

## 139. Sociology of Education (3) I

Prerequisite: Sociology 1 or 102.
Social organization of education, teaching as a profession. Class, ethnic and other social factors affecting the educational process. Educational institutions and the community.

## .

Prerequisites: Sociology 1 or 102 and Psychology 1.
The major problems and findings of social-psychological studies with reference processes of social interaction. Not open to students with credit in Psychology 145

## 145. Socioiogy of Mass Communication (3) I, I

Prerequisite: Sociology 1 or 102 . Sociology 140 and 146 are recommended.
Sociological analysis of the processes and effects of mass communications in different social systems, their functions and dysfunctions, and their relationship to other social institutions.

## 46. Collective Behavior (3) I, II

Prerequisites: Sociology 1 or 102, and 140.
The basic processes of social behavior in masses and groups, including crowd behavior, fads, fashions, crazes, panics, rumors; sects and cults; heroes and scape goats; social movements; effects of mass communication.
147. Sociology of Social Movements (3) I, II

Prerequisite: Sociology 1 or 102. Sociology 122 and 146 are recommended.
Revolutionary and reform movements in relationship to the larger society. Conditions leading to development of social movements, emergence of leadership, ideogies, strategies, recruitment of members and social consequences, case studie

## 148. Small Groups (3) 1

Prerequisites: Sociology 1 or 102, and 140.
Processes, morale and organization of small groups; their role in society and institutions such as industry, military, recreation and education; recent studies and methods of research.

## 50. Population Problems (3) I

Prerequisite: Sociology 1 or 102
Problems of population relative to age, sex, and racial distribution. Population practices and theories. Biological and geographical aspects of population problems. International population movements.
151. Research Methods in Demography (3) II

Prerequisites: Sociology 60 or Economics 2, and Sociology 150.
Standard procedures in the measurement of fertility, mortality, natural increase, migration, population growth and manpower, and working activities. Appraisal of
157. Urban Sociology (3) II

Prerequisite: Sociology 1 or 102.
The structure and function of the modern city; types of neighborhoods; forms and groups; rural-urban conflicts of culture . Prean area; types of urban personalities

## 160. Quantitative Methods in Social Research (3)

Prerequisite: Sociology 60.
The use of parametric and non-parametric techniques in the analysis of social relational techniques.
164. Methods of Social Research (3) I, II

Prerequisites: Sociology 1 or 102, and 60.
Research methods and interpretation used in the study of communities, insti-

## 197. Investigation and Report (3) I, II

Prerequisite: Fifteen units in sociology and consent of instructor.
Analysis of special topics in sociology. Maximum credit six units

## 200. Seminar in Social Theory (3)

205. Directed Readings in Social Theory (3)
206. Seminar in Social Disorganization (3)
207. Directed Readings in Social Disorganization (3)
208. Seminar in Social Organization (3)
209. Directed Readings in Social Organization (3)
210. Seminar in Social Institutions (3)
211. Directed Readings in Social Institutions (3)
212. Seminar in Social Psychology: Sociological Approaches (3)
213. Directed Readings in Social Psychology: Sociological Approaches (3)
214. Seminar in the Community (3)
215. Directed Readings in the Community (3)
216. Seminar in Research Methods (3)
217. Directed Readings in Research Methods (3)
218. Seminar in Population and Demography (3)
219. Directed Readings in Population and Demography (3)
220. Bibliography (1)
221. Research (3)
222. Special Study (1-3)
223. Thesis (3)

## Spanish and Portuguese

In the College of Arts and Letters

## Faculty

Emeritus: Brown, L.
Professors: Baker, C. H., Case, Lemus
Associate Professors: Head, Sender, Weeter, Walsh, J. (Chairman)
Assistant Professors: Barrera, Christensen, Fornoff, Jiménez-Vera, O'Brien, M., Segade, Talamantes, Windsor

## Offered by the Department

Master of Arts degree in Spanish.
Major in Spanish with the A.B. degree in liberal arts and sciences.
Teaching major in Spanish with specialization in both elementary and secondary teaching.
Minor in Spanish.
Teaching minor in Spanish with specialization in both elementary and secondary teaching.

## Spanish Major

With the A.B. in Liberal Arts and Sciences
A minor is required in a field approved by the departmental adviser.
Preparation for the major. Spanish $1,2,3,4,10$, and 11 (20 units).
Major. Twenty-four upper division units in Spanish, to include Spanish 101A$101 \mathrm{~B}, 102 \mathrm{~A}-102 \mathrm{~B}$, and 12 units in the period literature of the language.

For the Standard Teaching Credential
Preparation for the major. As above.
Teaching major. Twenty-four upper division units, to include Spanish 101A$01 \mathrm{~B}, 102 \mathrm{~A}-102 \mathrm{~B}, 150,190$, and six units of electives in Spanish. Candidates for the lementary credential must in addition complete Education 136. Candidates for the econdary credential must in their postgraduate year complete six units of gradate courses (200-numbered) in Spanish.

## Spanish Minor

The minor consists of 15 units in Spanish, six of which must be upper division. For elementary teaching it consists of 20 units in Spanish, six of which must be pper division. For secondary teaching it consists of 20 units in Spanish, to inppanish $101 \mathrm{~A}-101 \mathrm{~B}$ and $102 \mathrm{~A}-102 \mathrm{~B}$.

## High School Equivalents

High school foreign language courses may be used for purposes of placement in college courses and may be counted toward meeting the foreign language require-隹 in various majors. These high school courses will not count as college credit meward graduation.
The first two years of high school Spanish may be counted as the equivalent of panish 1; three years the equivalent of Spanish 2; and four years the equivalent of Spanish 3. The last year-course taken by a student in the high school language sequence may be repeated in college for graduation credit, not to exceed four units f repeated foreign language work. Students entering San Diego State with high school Spanish may enroll in Spanish 4; the department ecommends, however, that they take Spanish 21, 22, or 23.
Parallel provisions apply to Portuguese.

1. Elementary (4)

Four lectures and one hour of laboratory.
Pronunciation, oral practice, reading on Luso-Brazilian culture and civilization, essentials of grammar.
2. Elementary (4)

Four lectures and one hour of laboratory.
Prerequisite: Portuguese 1.
Continuation of Portuguese 1.
3. Intermediate (4)

Prerequisite: Portuguese 2
A practical application of the fundamental principles of grammar. Reading in

## 4. Intermediate (4)

Prerequisite: Portuguese 3.
Continuation of Portuguese 3.
10. Conversation (2)

Prerequisite: Portuguese 2.
Practice in the spoken language; practical vocabulary; conversation on assigned topics; simple dialogues and plays.

## 11. Conversation (2)

Prerequisite: Portuguese 10.
Continuation of Portuguese 10.
101A-101B. Advanced Oral and Written Composition (3-3)
Prerequisite: Portuguese 4.
Oral and written composition in Portuguese, based on models from modern
Portuguese and Brazilian literature.
134. Portuguese Literature (3)
134. Porruguese Literature (3)

A study of important movements, authors and works in the literature of Portu-

## 135. Brazilian Literature (3)

A study of the important movements, authors and works of the literature of Brazil from the colonial period to modern times.
185. Selected Studies (3)

Topics in Luso-Brazilian language, literature, culture, and linguistics.

## Spanish

1. Elementary (4) I, II
aboratory
Four lectures and one hour of laboratory.
Pronunciation, oral practice, readings on Spanish culture and civilization, mini-
mum essentials of grammar.

## 2. Elementary (4) I, II

Four lectures and one hour of laboratory
Prerequisite: Spanish 1 or two years of high school Spanish.
Continuation of Spanish 1.

## 3. Infermediate (4) I, II

Prerequisite: Spanish 2 or three years of high school Spanish
A practical application of the fundamental principles of grammar. Reading in Spanish of cultural material, short stories, novels or plays; oral practice: ing reading with oral and written reports. Special sections available for the Spanish
speaking.

## 4. Intermediate (4) I, II

Prerequisite: Spanish 3 or four years of high school Spanish.
Continuation of Spanish 3. Special sections available for the Spanish speaking

## 10. Conversation (2) i, 1

Prerequisite: Spanish 2 or three years of high school Spanish
Practice in the spoken language; practical vocabulary; conversation on assigned topics; simple dialogues and plays.

## 11. Conversation (2) I, II

Prerequisite: Spanish 10 or Spanish 3, or four years of high school Spanish. Continuation of Spanish 10.

## 21. Intermediate Oral and Written Composition (3)

Prerequisites: Spanish 4 and 11.
Directed written composition with stress on current usage. Oral reports on assigned topics.

## 22. Introduction to Syntax and Style (3)

Prerequisites: Spanish 4 and 11 .
Study of structure and idiomatic usage. Analysis of style based on passages chosen rom modern literature.
23. Introduction to Literature (3)

Prerequisites: Spanish 4 and 11.
Selected readings from Peninsular and Latin American prose. Oral and written reports and class discussions. Course conducted in Spanish.

## 40. Spanish Civilization (3)

Prerequisite: Spanish
The major currents and characteristics of Spanish culture, as expressed through the centuries in literature, art, and philosophy

## 41. Spanish-American Civilization (3)

Prerequisite: Spanish 4.
The major currents and characteristics of Spanish-American culture, as expressed through the centuries in literature, art, and philosophy.

## 42. Mexican Civilization (3)

Prerequisite: Spanish 4.
The major currents and characteristics of Mexican culture, as expressed through the centuries in literature, art, and philosophy.

## 101A-101B. Advanced Oral and Written Composition (3-3)

Prerequisites: Spanish 4 and 11. with a grade of C or better.
Translation into Spanish of moderately difficult English prose passages. Free composition in Spanish. Outside reading of modern Spanish plays, with written reports in Sp phonograph recordings. Special sections available for the Spanish speaking.

## 102A-102B. Survey Course in Spanish Literature (3-3)

Prerequisite: Spanish 4 with a grade of C or better.
Important movements, authors, and works in Spanish literature from the Middle Ages to the present.

## 04A-104B, Spanish-American Literature (3-3)

Prerequisites: Spanish 4 and 11 with grade of C or better.
Reading from representative Spanish-American authors during the colonial, revoReading and modern periods. Lecturers, class reading, collateral reading and reports.

105A-105B. Modern Spanish Drama (3-3)
Prerequisites: Spanish 4 and 11 with grade of C or better.
The development of the drama of Spain from the beginning of the nineteenth entury to the present time.
106A-106B. Mexican Literature (3-3)
Prerequisites: Spanish 4 and 11 with grade of C or better.
Aspects of Mexican culture. The first semester, a rapid survey of Mexican literatwentieth century, with emphasis on the contemporary. The second semester, the
107. Caribbean Area Countries Literature (3)

Prerequisites: Spanish 4 and 11.
Literature of Caribbean Islands, Central America, Colombia and Venezuela, from colonial period to present. Special emphasis on contemporary era
108. Andean Countries Literature (3)

Prerequisites: Spanish 4 and 11.
Literature of Ecuador, Peru, Bolivia and Chile from the period immediately preceding the Spanish conquest to today.

## 109. River Plate Literature (3)

Prerequisites: Spanish 4 and 11.
Literature of Argentina, Paraguay and Uruguay from colonial period to present.
110. Nineteenth Century Spanish Novel and Short Story (3)

Prerequisites: Spanish 4 and 11.
The development of the novel and short story in Spain in the nineteenth century.
111. Twentieth Century Spanish Novel and Short Story (3)

Prerequisites: Spanish 4 and 11.
The development of the novel and short story in Spain to 1936, with emphasis
112. Contemporary Spanish Novel (3)

Prerequisites: Spanish 4 and 11.
The development of the novel and short story in Spain since 1936.
130. Poetry of the Spanish Golden Age (3)

Prerequisites: Spanish 4 and 11.
Major poets of the Siglo de Oro.
131. Prose of the Spanish Golden Age (3) Prerequisites: Spanish 4 and 11.
Major prose writers of the Siglo de Oro.
132. Drama of the Spanish Golden Age (3)

Prerequisites: Spanish 4 and 11.
The major dramatists of the Siglo de Oro.

## 140. Spanish Civilization (2)

Offered only at the Imperial Valley campus.
An advanced course in Spanish culture of the past and present, with emphasi on the arts, philosophy, and literature. Lectures, class discussions, outside readings,
written reports on individual topics.
41. Spanish-American Civilization (2)

Offered only at the Imperial Valley camp
An advanced course in Spanish-American culture. From the period of Spanish Conquest to the present, with emphasis on the arts, literature, and of the ophy. Lectures, class discussions, outside readings, written reports on individual
topics.
149. Spanish Linguistics (3)

Prerequisites: Spanish 4 and 11
Structural, historical, and applied Spanish linguistics.

## 150. Phonetics and Phonemics (3) II

Prerequisites: Spanish 4 and 11 with a grade of C or better.
The sounds of Spanish and of the Spanish phonemic system, with special attention to the problems involved in the teaching of Spanish pronunciation to Englishspeaking students.
170. Spanish-American Poetry (3)

Prerequisites: Spanish 4 and 11.
Spanish-American poetry of the 19th and 20th centuries.
171. Spanish-American Short Story (3)

Prerequisites: Spanish 4 and 11.
Principal Spanish-American short story writers.
172. Spanish-American Theatre (3)

Prerequisites: Spanish 4 and 11.
Principal Spanish-American dramatists and movements.
180. Modern Spanish Poetry (3)

Prerequisites: Spanish 4 and 11
Spanish poetry of the 19th and 20th centuries.

## 185. Selected Studies in Spanish (3

Topics in Spanish or Spanish-American language, literature, culture, and linguistics. Maximum credit six units.

## mar (3)

Prerequisites: Spanish 101A and 101B.
Significant systematic features of modern Spanish grammar with analysis of passages from literature. Recommended for credential applicants.
201. History of the Spanish Language (3)
202. Cervanfes (3)
203. Lope de Vega and Calderon (3)
204. The Spanish-American Novel (3)
205. The Gaucho Epic (3)
206. Modernism (3)
207. Medieval Spanish Literature (3)
208. The Modern Spanish Essay (3)
209. The Spanish-American Essay (3)
210. Contemporary Spanish-American Prose Fiction (3)
220. Seminar in Spanish Golden Age Literature (3)
230. Seminar in 19th Century Spanish Literature (3)
240. Seminar in 20th Century Spanish Literature (3)
250. Seminar in Spanish-American Literature (3)
255. Seminar in Spanish-American Culture and Thought (3)
260. Seminar in Medieval Spanish Literature (3)
270. Applied Spanish Linguistics for Teachers (3)
290. Research and Bibliography (3)
294. Comprehensive Reading and Survey Course (3)
298. Special Study (1-3)
299. Thesis (3)

## Faculty

Professors: Ackley, Adams, W., Benjamin, Mills (Chairman), Samovar Assistant Professors: Babich, Sanders, Smith, Craig R.

## Offered by the Department

Master of Arts in speech.
Major in speech with the A.B. in applied arts and sciences.
Teaching major in speech, with specialization in secondary teaching
Minor in speech.
Teaching minor in speech, with specialization in both elementary and secondary
teaching.

## Speech Major

With the A.B. in Applied Arts and Sciences
Preparation for the major. Speech Communication 5, 11A or 11B, 60 , and 62 12 units).
Major. Twenty-seven upper division units, to include Speech Communication tion.

For the Standard Teaching Credential for Secondary Teaching

$$
\begin{aligned}
& \text { The requirements are as above, except that in his postgraduate year the candi- } \\
& \text { date must take six upper division or graduate unite in }
\end{aligned}
$$

or graauate units in speech communication.

## Speech Minor

The minor consists of 23 units in speech communication, to include Speech Communication 3 or $4,11 \mathrm{~A}$ or $11 \mathrm{~B}, 60,62$, and twelve units of upper division electives speech communication.
The requirements are the same for the minor for elementary and secondary
teaching.

## 3. Oral Communication (2-3) I, I

Training in fundamental processes of oral expression; method of obtaining and organizing material; outlining; principles of attention and delivery; practice in con4 recommended in general educations of speeches. Speech Communication 3 or Mexican-American Studies 2A. (Formerly numbered Speech Atudents with credit for

## 4. Intermediate Public Speaking (3) $\mathbf{I}$, $\mathbf{I}$

Practice in extemporaneous speaking on subjects of current interest, both national and local, with stress on organization and delivery. Speech Communication 3 or recommended in general education. Not open to students with credit for MexicanAmerican Studies 2A. (Formerly numbered Speech Arts 4.)
5. Introduction to Speech Communication (3) I, II

An introduction to the field of speech communication.

## 11A. Fundamentals of Interpretation (3) I,

Application of the principles involved in "making words come alive": response作 poetry and prose. (Formerly numbered Speech Arts 11A).
152. Rhetorical Theory and Criticism 400 A.D. to 1900 (3) I, II

Prerequisite: Speech Communication 150.
An analysis of rhetorical theory and criticism with special attention to Longinus,
Vives, Ramus, Cox, Bacon, Campbell, Whately of theory and systems of criticism culminaly, Blair, and James. The development public discourse.
154. Contemporary Rhetorical Theory and Criticism (3) I, II

Prerequisite: Speech Communication 150.
An analysis of rhetorical theory and criticism in the twentieth century with
special attention to Arnold, Bitzer, Burke, Hochmuth, and Winans of principles for rhetorical theory Burke, Hochmuth, and Winans. A unified body contemporary discourse.
161. Intercollegiate Debate (1) I, II

Two field trips required.
Three hours of activity and two coaching hours to be assigned. Credit for participation in intercollegiate program. Maximum credit four units for 61 and 161.
(Formerly numbered Speech Arts 161.)
162. Advanced Argument

The approaches to argument and the patterns and problems in argument. Con sideration of implications for society. Written and oral reports. (Formerly num-
bered Speech Arts 162 .)
180. American Public Address (3) I, II

Public discourse from the colonial period to the present.
189. Ethics of Speech Communication (3)

Prerequisite: 6 upper division units in philosophy or speech communication.
Classical and modern ethical concepts applied to oral persuasion.
191. Group Communication (3) I, II

The role of group discussion in a democratic society. Principles and methods of group discussion in problem solving and learning situations. Practice in dealing with questions of policy and controversial issues. Development of skills in discussion preparation, participation and leadership. (Formerly numbered and entitled: Speech
Arts 191, Organized Discussion.)
192A. Advanced Public Speaking (3) I
Prerequisite: Speech Communication 4.
The preparation and delivery of longer speeches. Study of classic models of
public address. (Formerly numbered Speech Arts 192A ) 1928. Oral Persuasion (3) II

Prerequisite: Speech Communication 4.
Oral persuasion with an emphasis on motivation and the evaluation of persuasive techniques. Research project on a significant current problem. Results of research and persuasive principles used in actual speech. (Formerly numbered Speech Arts
192B.)
193. Mass Persuasion (3) I, II

Prerequisite: Speech Communication 4.
An historical and critical analysis of the theories, techniques and ethics of oral communicators who employ radio and television as a means of presenting social,
poligious issues. (Formerly numbered Speech Arts 193.)
194. History of Public Address (3) II

Prerequisite: Speech Communication 4
Speakers and speaking from Ancient Greece to the present. Functions of public speaking in the growth and development of ideas, ideals, and institutions. (For-
merly numbered Speech Arts 194.)
198. Selected Topics in Speech Communication (1-3) I, II

Prerequisite: Twelve units in speech communication.
A specialized study of selected topics from the areas of speech communication.
May be repeated with new content. Maximum credit six units.
200. Research and Bibliography (3)
208. Seminar in Oral Interpretation (3)
230. Seminar in the Analysis of Language (3)
235. Seminar in Communication Theory (3)
250. Seminar in Rhetorical Theory (3)
251. Seminar in Rhetorical Criticism (3)
262. Seminar in Argumentation (3)
280. Seminar in American Public Address, 1600-1850 (3)
281. Seminar in American Public Address, 1850 to present (3)
282. Seminar: Contemporary American Public Address (3)
290. Experimental Procedures in Speech Communication (3)
291. Seminar in Group Discussion Theory (3)
293. Seminar: Greek and Roman Public Address (3)
294. Seminar: 18th Century British Public Address (3)
298. Special Study (1-3)
299. Thesis or Project (3)

## Speech Pathology and Audiology

In the College of Professional Studies

## Faculty

Professors: Earnest (Chairman), Kopp, H., Pfaff, Riedman
Associate Professors: Nichols, A., Thile
Assistant Professors: Dimmick, Harris, M.

## Offered by the Department

Master of Arts in speech pathology and audiology.
Major in speech pathology and audiology with the A.B. in applied arts and sciences.
Minor in speech, with emphasis in speech pathology and audiology.
Specialized preparation in lieu of a minor: teacher of deaf or severely hard of hearing. See Education.
Specialized preparation in lieu of a minor: teacher of handicapped in speech or
hearing (Plan I). See Education. hearing (Plan I). See Education
Restricted Credential, Speech and Hearing Specialist (Plan II).

## Major in Speech Pathology and Audiology

 With the A.B. in Applied Arts and SciencesPreparation for the major. Mathematics 3 (or qualification on the mathematics placement examination); Physics 5; Psychology 1, 50, and 70; Speech Communication 3 or 4; Speech Pathology and Audiology 4, 5, and 6 (26-27 units).
Major. Twenty-four units selected, with approval of the adviser, from Speech

## Speech Minor

The minor in speech, with emphasis in speech pathology and audiology, consists of 15 units in speech pathology and audiology, nine of which must be upper

## Restricted Credential: Speech and Hearing Specialist

This is a five-year program leading to a credential which authorizes service in all grades in the area specified. It requires the same lower division courses as are required in the preparation for the major in speech pathology and audiology, a
bachelor's degree, and completion of the following courses Education and 167: Psychology 106; Speech Pathology and Audiolosy Education 101 (or 202) (or 206), 126, 127, 128, 129, 140, 145, 151, and 228; and 15 units, chosen with approval of the adviser, from Speech Pathology and Audiology 143, 150, 152, 190,
$198,201,202,203,204,205$, and 206. 201, 202, 203, 204, 20, and 2

1. Speech for International Students (3)

Training in production of American speech sounds, blending and assimilation, American prose rhythm and oral communications. Emphasis on clarity and intelligibility. Practical work in aural comprehension. Prerequisite: Designation by speech
testing committee. (Formerly numbered Speech Arts 1-X.)
2. Oral Communication for International Students (2)

Oral expression; obtaining, organizing material; outlining; pronunciation. May substitute for Speech Communication 3 or 4. (Formerly numbered Speech Arts
$1-\mathrm{Y}$.)
3. Oral Communication Laboratory (1) 1 , It

Two hours of laboratory
Individual laboratory training on specific speech problems. Students are admitted by means of a test administered by the department.
4. Voice and Articulation (3) I, II

Vocal and articulatory dynamics as bases of standard and non-standard oral anguage patterns. Practice in recognition and recall of such patterns.
5. Survey of Audiology (2) I

Audiology in diagnosis and rehabilitation of hearing impairment, medical pracice, hearing conservation and research. Fifteen hours of observation required (Formerly numbered Speech Arts 71.)
6. Language, Speech and Hearing Disorders (3) I, il

Normal growth and development and -its relationship to language, speech and earing development and disorders, covering all areas of exceptionality. Twenty five hours of observation or project required. (Formerly numbered Speech Art 70.)
7. Management of Clinical Activities (1) I, II

Formerly Speech Pathology and Audiology 101
Assisting in the operations of the speech and hearing clinic. Maximum credit two units.
105. Language and Speech Development and Disorders (3) I, II

Normal development of speech and language; prevention and remediation of communication disorders commonly found in the classroom. For students not majors in speech pathology and audiology.
120. Phonetics (3) I, II

Auditory and kinesthetic analysis of the sounds of the English language. Problems of foreign and bilingual dialect. (Formerly numbered Speech Arts 100.)
121. Anatomy, Physiology and Pathology of Speech (3) I, II

Prerequisite: Speech Pathology and Audiology 6.
Arequmy, physiology and pathology of speech. Survey of aphasia, cerebral palsy, Anatomy, physiology and pathology study of multiply handicapped child.
122. Functional Communication Disorders (3)

Prerequisites: Speech Pathology and Audiology 6 and 121.
Speech disorders of emotional etiology, including stuttering. Genetic and cultural spects of speech and language; phenomena of human communication, including difficulties in communication.

## 23. Mechanics of Speech Production (3)

Two lectures and two hours of laboratory.
Prerequisite: Psychology 50.
Functional anatomy of head, neck and thorax including laboratory exercises and monstals, histological materials and cadavers. (Formerly numbered Speech Arts 172. )

## . Methods of Speech Therapy (3)

Prerequisites: Speech Pathology and Audiology 6 and 121.
Application of theories of learning to techniques in treatment of specific speech Applanguage disorders with emphasis on problems of articulation, voice, and oreign dialect. Demonstrations

## 126. Clinical Practice in Speech Pathology (1-3) I, II, S

Prerequisites: Speech Pathology and Audiology 120, 121, and three upper division
units in speech pathology and units in speech pathology and audiology.
Supervised practice with representative speech problems. Maximum combined
credit, eight units for Speech Pathology represents 26 hours of direct clinical practice. Audiology 126 and 145. One unit

## 127. Diagnostic Methods in Speech Pathology (3) I, II

Prerequisites: Speech Pathology and Audiology 120, 121, 123, and 140, and credi or concurrent registration in Speech Pathology and Audiology 126.
Principles and procedures in the assessment and prognosis of communication dis orders to include delayed speech and mental retardation. Case histories, testing
interviewing, and clinical reporting. Child interviewing, and clinical reporting. Child, parent, and teacher counseling.

## 128. Diagnostic Practicum in Speech Pathology (3)

Prerequisite: Speech Pathology and Audiology 12
Supervised clinical practice in diagosic 127
nary assessment. Practicum minimum of six hours.

## 129. Speech Therapy in the Public Schools (3) I

Knowledics Speech Pathology and Audiology 6 and 121
speech and hearing; conducting surveys; preparing reports. (Fation as related to speech Arts 170B.)
Speech And
130. Family Communication Dynamics (3) 5

Prerequisites: Speech Pathology and Audiology 122 and 126.
to the origin and alleviation of functional and organic-child interaction in relation

## 131. Language Structure (3)

Prerequisite: Speech Pathology and Audiology 6.
Systematic study of the design features of language as they relate to communica-
tion behavior. The primary focus is the role of communication.

## 132. Assessment of Language Disorders (3) I, II

Prerequisite: Speech Pathology and Audiology 131.
Identification of semantic and structural features of language.

## 133. Clinical Practice in Public Schools (4) I, II

Clinical practice in elementary or (4) I, II
specialist pathology. Applies only toward Restricted Creds or community colleges in pecialist.
140. Audiometry: Principles (3) 1, $\mathbf{5}$
(Same course as Education 17 )
(Same course as Education 177)
Prerequisite: Psychology 50.
Anatomy and physiology of the human ear, theories of hearing, physics of sound
nedical aspects, pathology and surgery of the ear techniques. (Formerly numbered Speech Arts 171A.)

## 14i. Audiometry: Application (3) it

Two lectures and two hours of laboratory.
Prerequisite: Speech Pathology and Audiology 140.
sensorineural hearing loss, industrial audiometry and tests for nonorganic and for merly numbered Speech Arts 171B.)
142. Techniques of Audiometry (1-3) I, II

Three hours of laboratory per unit.
Prerequisite: Credit for or concurrent registration in Speech Pathology and diology 140.
Provides the laboratory experience necessary for the California School Audiomerist Certificate when taken concurrently with 171A. Duplicates classic auditory experiments when taken in conjunction with 143 or 244 . Maximum credit three units. (Formerly numbered Speech Arts 171C.)

## 43. Hearing Amplification (3) II

Prerequisites: Speech Pathology and Audiology 140 and 141.
Specific application of amplification for rehabilitation of the impaired hearing mechanism; devices, methods for their evaluation, historical perspective and practical considerations. (Formerly numbered Speech Arts 175.)
145. Clinical Practice in Audiologic Assessment (1-3) I, II, S

Formerly Speech Arts 180B, Field Work in Clinical Practice in Testing Hearing. Prerequisite: Speech Pathology and Audiology 141.
Supervised procedures with pure tone, speech, and special audiologic testing. Maximum combined credit eight units for 126, 145, and 146. One unit represents 26 hours of direct clinical practice.
146. Clinical Practice with Hard of Hearing (1-3) I, II, $\mathbf{S}$

Prerequisite: Speech Pathology and Audiology 151.
Supervised practice with hard of hearing clients at San Diego State. Maximum Se rist units for 126,145 , and 146 . One unit represents 26 hours of direct clinical practice.

## 50. Education of Deaf Children (3)

Educational programs, services and resources for hearing impaired, historical background, philosophy, sociological and psychological problems. (Formerly dren.)
51. Speech Reading and Auditory Training (3) I, II

Prerequisites: Speech Pathology and Auditory 121 and 140.
Theory and methods of speech reading; auditory training techniques including survey of amplification systems. Twenty-six hours observation in programs for deaf, severely hard of hearing.
152. Speech Skills for the Deaf (3) I

Prerequisites: Speech Pathology and Audiology 121 and 150.
Theory and methods of teaching speech to the deaf. Twenty-six hours of obser ation in programs for deaf, severely hard of hearing. (Formerly numbered and entitled: Speech Arts 178B, Communication Skills for the Deaf.)
153. Language Skills for the Deaf (3) I

Prerequisites: Speech Pathology and Audiology 121 and 150.
General theoretical framework of language development; linguistic problems nherent in dearns of observation in programs for deaf and severely hard of hearing.

## 54. Physiological Phonetics (3)

Prerequisite: Speech Pathology and Audiology 120 or 152
Physiology underlying the production of continuing speech including transitional movements, based upon a syllabic concept.

## 156. Field Work with the Deaf (1-3) I,

Prerequisites: Speech Pathology and Audiology 151, 152, and 153.
Supervised experience in auditory training, lipreading, speech therapy and language building, with individual cases. Maximum credit six units.
157. Clinical Practice with the Deaf (1-2) I, II

Prerequisites: Speech Pathology and Audiology 151, 152, and 153.
Supervised therapy with representative deaf problems in the San Diego State Speech and Hearing Clinic. Maximum combined credit six units for 156 and 157.
190. Workshop in Speech Pathology and Audiology (1-3) I, II

Study of some problem in speech pathology or audiology. Maximum credit six units. (Formerly numbered Speech Arts 109.)
198. Selected Topics in Speech Pathology and Audiology (1-3) I, II

Prerequisite: Twelve units in speech pathology and audiology.
Specialized study of selected topics from the area of speech pathology and audiology. Maximum credit six units.

## 200. Research and Bibliography (3)

## 201. Voice Science (3)

202. Problems of Aphasia (3)
203. Problems of Cerebral Palsy (3)
204. Problems of Cleft Palate (3)
205. Problems of Stutfering (3)
206. Problems of Voice Pathology (3)
207. Advanced Clinical Practice in Speech Pathology (1 or 2)
208. Advanced Diagnostic Methods in Speech Therapy (3)
209. Medical Audiology (3)
210. Audiology (3) I
211. Advanced Clinical Practice in Audiologic Assessment (1-2)
212. Advanced Clinical Practice with the Hard of Hearing (1-2)
213. Seminar in Audiology (3)
214. Advanced Field Work with the Deaf (1-3)
215. Differential Diagnosis of the Hearing Impaired (3) I
216. Special Study (1-3)
217. Thesis or Project (3)

## Telecommunications and Film <br> In the College of Professional Studies

## Faculty

Professors: Jones, K., Lee, R. (Chairman)
Associate Professors: Jameson, Madsen, Wylie
Assistant Professors: Anderson, H., Johnson, E. B., Johnson, J., Meador, T Lecturer: McMullen, J. L.
Offered by the Department
Master of Arts in radio-television.
Major in radio-television, with the A.B. in applied arts and sciences.
Major in radio-television, with the B.S. in applied arts and sciences
Major in drama, with emphasis in design for television. See Drama.
Minor in radio-television.

## Major in Radio-Television

## With the A.B. in Applied Arts and Sciences

The A.B. degree is designed for students interested in developing a more liberal education as they develop competency in, and understanding of, radio, television, and film. The A.B. degree permits flexible programs utilizing courses in and out of the department which will prepare students in such broad areas as design fo tional radio and television, and the like.

A minor is required with this major.
Preparation for the major. Telecommunications and Film 1, 3, ${ }^{10}, 20,30,67$ and 83. ( 21 units.)
Major. A minimum of 24 upper division units in telecommunications and film to include Telecommunications and Film 101 or 105, 162, 196 and fifteen units of telecommunications and film may be counted toward the 124 units required for graduation.

## With the B.S. in Applied Arts and Sciences

The B.S. degree is designed to prepare students for professions in radio, television, and film or for occupations where extensive knowledge of these media is required

Preparation for the major. Telecommunications and Film 1, 3, 10, 20, 30, 67 and 83 . ( 21 units.)

Major. A minimum of 36 upper division units to include Telecommunications and Film 162 and 196, a core professional sequence, and a minimum of six units in an allied professional sequence.
Core Professional Sequence.
TV Production: Telecommunications and Film 101 or 105, 110, 156, 183, 184 ( 18 units.)
Management: Telecommunications and Film 101, 103, 105, 130, and Psychology 122. (15 units.)

Film: Telecommunications and Film 101 or $105,110,150,156,168$. ( 17 units.)
Allied Professional Sequences. (Courses taken in Core Professional Sequences cannot be counted toward the Allied Professional Sequence.)
Advertising. Telecommunications and Film 103, Business Administration 150, 153, and Journalism 153.
Art. Art 107, 114A, 114B, 190, and Industrial Arts 115.

Communication．Speech Communication 135，193，Journalism 117，121，and 162. 152A，152B，and Speech Communication Philosophy 142，Comparative Literature Education，Telecom ion
Education．Telecommunications and Film 170，Education 101，111，and 144.
Information Systems．Business A
Information Systems．Business Administration 184，185，186，and 188.
International Media．
International Media．Telecommunications and Film 108，163，and Journalism 118.
Management．Telecommunications and Film 101，Business Administration 140 ，
143 and 145 ．
News．Telecommunications and Film 105，112，and Journalism 102，124，and 125.
Performance．Telecommunications and Film 180，181， Performance．Telecommunications and Film 180，181，and Speech Communica－
tion 108．
Playwriting．Telecommunications and Film 110，Drama 120，122，and English 171.
Scene Design．Telecommunications Scene Design．Telecommunications and Film 150，156，and Drama 140A and 148.

## Minor in Radio－Television

The minor consists of 15 units in telecommunications and film to include Tele－ communications and Film 1 and 3，and at least six units in upper division courses．
1．Backgrounds in Broadeasting（3）I，II
Theory and operation of the broadcasting industry to include the history regulation of broadcasting in the U．S．，the social and economic setting history and broadcastitg and the organization of commercial and educational radio and tele－
vision stations．（Formerly numbered Speech Arts 80 ．）

3．Technical Operations for Broadeasting（3）I，II
Two lectures and more than three hours of scheduled activity．
Control room and studio techniques necessary for radio Includes camera operation，video control，television lighting，televvision operation． and operation of audio equipment．Students work on crews of KPBS－FM and TV， IV productions．（Formerly numbered Speech Arts 81．）

## 10．Broadcast Writing（3） $\mathbf{I}$ ，II

Two lectures and more than three hours scheduled activities．
Theory and practice in writing materials for oral presen
timing and pacing，conversational expression，and oral presentation．Problems of continuity for KPBS－FM．（Formerly numbered Speech Arts 79．）Students provide
20．Introduction to Photography（3）I，II
（Same course as Industrial Arts 40. ）
One lecture and six hours of laboratory．
A consideration of photographic optics and chemistry；nature of light and image
formation；photographic emulsions，exposure and dell lighting．Not open to students with credit in Journalism 50 （．Composition and Speech Arts 85．）

## 30．Radio Production（3）I，II

Two lectures and more than three hours of scheduled activity
Prerequisite：Telecommunications and Film 3.
Theory of radio production augmented by practice in pro
（Formerly numbered Speech Arts 82．）planning and

## 32．Workshop in Educational Radio Broadeasting（6） $\mathbf{S}$（9 weeks）

Program planning，staff administration，and announcinsting operations，to include will function in staff duties for KPBS－FM announcing：Students in the workshate tions and Film 132．Not open to students with credit and Film 132．（Formerly numbered Speech Arts 44S．）

56．Staging and Art for Television and Film（3）I，II
Two lectures and three hours of laboratory．
Technical practices，aesthetic considerations，and organization of production for television and film．（Formerly numbered and entitled：Speech Arts 56，Dramatic Production．）

## 67．Cinema as Art and Communication（3）I，il

Prerequisite：Sophomore standing．
An appreciative survey of cinema，with emphasis upon the feature film and the documentary．Historical and stylistic influences upon the aesthetic values and Speech Arts 67．）
70．Broadeasting Activities for Schools（3）I
Two lectures and three hours of scheduled activity．
The planning and production of radio and television broadcasts．Designed for students interested in handling broadcast activities in speech and drama classes and workshops for high schools and junior colleges．Not open to students with credit in Telecommunications and Film 1．（Formerly numbered Speech Arts 86. ）

## 83．Television Production and Directing（3）I，II

Two lectures and more than three hours of scheduled activity．
Prerequisites：Telecommunications and Film 3 and 10.
Theory and practice in the skills and knowledge of television production In－ Theory and practice in the skills and knowledge of television production．In－ to production staff．（Formerly numbered Speech Arts 83．）

## 90．Broadeast and Film Performance（3）I，II

Two lectures and more than three hours of scheduled activity．
Prerequisites：Drama 10 or Speech Communication 11A，and Drama 30.
Preparation and delivery of materials before the microphone and camera．Par－ ticipation in productions for KPBS－FM，KPBS－TV，ETV，ITV and motion pic－ tures．（Formerly numbered Speech Arts 88．）
101．Broadcast Management（3）I，II
Prerequisites：Telecommunications and Film 1，30，and 83
Administration and organization of radio and television，including radio and tele－ vision as advertising media，broadcasting research，station organization，promotion and sales，and current developments in radio and television as mass media．（For－

## 103．Broadcast Advertising（3）I

Prerequisites：Two courses in broadcasting or journalism．
Theory，procedures，and the role of broadcast advertising，including marketing and media research，campaign planning，media strategy，time purchasing，and evaluation．
104．Broadcast Commercial Practices（3）II
Prerequisites：Telecommunications and Film 30，83，103，and permission of in－ structor．
Planning and execution of broadcast advertising and promotion campaigns；crea－ tive strategy and production techniques；use of research；campaign evaluation．

## 105．Regulation of Broadcasting（3）I，II

Prerequisites：Telecommunications and Film 1，30，and 83.
Responsibilities of broadcasters as prescribed by law，governmental policies and regulations，and significant court decisions．（Formerly numbered Speech Arts 120.

## 108．International Broadcasting（3）Il

Prerequisite：Telecommunications and Film 105
Comparative study of broadcasting in various world areas；economic，social and political determinants of broadcasting patterns．（Formerly numbered Speech Arts 121．）
110. Writing and Producing for Broadeasting and Film (3) I, II

Prerequisites: Telecommunications and Film 1, 30, and 83.
Scripting of dramatic and documentary forms, to include the development of original materials and adaptations for the broadcast media and film, as well as problems in the post-writing process of preparing scripts for production, and the
development of program and series ideas. (Formerly numbered Speech Arts 186.)
112. Radio and Television News (3) 1, II
(Same course as Journalism 104)
Gathering, writing, and editing news in special forms required by radio and television; processing wire service copy, still pictures and kinescopes; filming, editing and scripting news on motion pictures; using recorders to report special
events. (Formerly numbered Speech Arts 187.) events. (Formerly numbered Speech Arts 187.)

## 130. Radio Programming (3) I

Two lectures and more than three hours of scheduled activity.
Prerequisites: Telecommunications and Film 1 and 30.
Formats, policies, production practices, and research in modern programming. Speech Arts 146.

## 132. Workshop in Educational Radio Broadcasting (6) S (9 weeks)

Practice and theory in educational radio broadcasting operation to include program planning, staff administration, and announcing. Students in this workshop will and Film 32. (Formerly numbered S. Offered jointly with Telecommunications

## 150. Lighting for Television and Film (3) I, II

Two lectures and three hours of laboratory.
Theory and application of such aspects as color temperature, light sources and fim emusions, fiters and design of values and colors, and factors of electroni transmission. Work on KPBS-TV, ETV, CCTV, and formal films. (Formerly numbered and entitled: Speech Arts 145A-145B, Stage Lighting.)
156. Advanced Lighting and Staging for Television and Film (4) I, II

One lecture and more than nine hours of scheduled activity.
Prerequisites: Telecommunications and Film 3, 20, 56.
Production elements of television and film, to include lig
Production elements of television and film, to include lighting and staging techniques, art and graphics, scene design and scene decoration. Experience in various cipally by work for KPBS-TV and ETV. (Formerly numbered Spenstrated prin-

## 162. Film Techniques (3) I, II

Two lectures and three hours of scheduled activity.
Prerequisite: Telecommunications and Film 20.
Principles of film theory, and practice in cinematography and editing; use of motion picture equipment. Technique and theory as they apply to the several filmic forms. Preparation of filmed materials. (Formerly numbered Speech Arts
167.)

## 163. International Cinema (3) I

Prerequisite: Telecommunications and Film 67.
Foreign feature films as expressions of national attitudes. (Formerly numbered
Speech Arts 189.)

## 165. Animated Film Techniques (3) $\mathbf{I}$, II

Screening of representative examples and production of a filmograph or animated
motion picture. (Formerly numbered Speech Arts 197.)

## 168. Film Production (4) I, II

One lecture and nine hours of scheduled activity
Prerequisite: Telecommunications and Film 162.
Prequite. Telecon.
Advanced practicum Speech Arts 168.)

## 170. Educational Broadcasting (3) II

Prerequisites: Telecommunications and Film 1, and Education 101 impact of noncommercial radio and television; introduction to production techimpact of noncommercial radio and television; introduction to production tech-
niques for instructional television; and procedures for the utilization of television in the classroom. (Formerly numbered Speech Arts 185.)

## 172. Workshop ih Educational Television (6) s

(Same course as Education 143-S)
Open to teachers and students interested in instruction by television
The procedures and theories of television production as it pertains to closed circuit and instructional use of television. The selection and utilization to closed content and the method of presenting material through the television of program be discussed and demonstrated. (Formerly numbered Speech Arts 143S.)

## 180. Directing Television and Film Drama (3) I, II

Planned for prospective directors of plays for television and film. The student will become acquainted with principles, procedures and methods. (Formerly num bered and entitled: Speech Arts 159, Dramatic Production Directing.)

## 181. Acting for TV and Film (3) I,

Prerequisite: Drama 55A.
Interrelationship of acting and the various media-radio, television, film. Experience in film and television productions. (Formerly numbered Speech Arts 123.)
183. Advanced Programing and Development for Television (4) I, II

One lecture and more than nine hours of scheduled activity.
Prerequisites: Telecommunications and Film 110, 162, and consent of instructor. The development of program ideas into formats for television productions of all types. Experience in developing and producing programs for CCTV and ETV. (Formerly numbered Speech Arts 183.)
184. Advanced Television Directing (4) I, II

One lecture and more than nine hours of scheduled activity.
Prerequisites: Telecommunications and Film 1, 56, 83, 162, 180 and consent of instructor.
Presentational techniques and individual projects in the direction and production 184.)
195. Workshop in Broadeasting (1-3) $\mathbf{1}$, $\boldsymbol{1}$

Study of some problem in radio, television or film. Maximum credit six units. (Formerly numbered and entitled Speech Arts 109, Workshop in Speech.)
196. Senior Project in Telecommunications and Film (3) I,

Limited to students in Telecommunications and Film.
Student must demonstrate proficiency in a phase of broadcasting from development of a program idea through production for either radio, television, or film. A research paper may be substituted at the discretion of the adviser if the projec Arts 188, Senior Project in Broadcasting.)
198. Selected Topics in Telecommunications and Film (1-3) I, II

Prerequisite: Twelve units in Telecommunications and Film
Specialized study of selected topics from the areas of tele
film. May be repeated with new content. Maximum of telecommunications and
200. Research and Bibliography (1)
201. Seminar in Broadcast Management (3)
202. Seminar in Broadeast Advertising Problems (3)
203. Seminar in History of Broadeasting (3)
205. Mass Communications Research (3)
210. Seminar in Writing for Broadeast and Film (3)
212. Criticism of Broadcasting and Cinema (3)
268. Directing the Dramatic Film (3)
270. Seminar in Educational Broadcasting (3)
272. Seminar in Mass Communication Theory (3)
273. Mass Communications Message Design (3)
284. Seminar in Programing and Production (3
298. Special Study (1-3)
299. Thesis or Project (3)

## Zoology

## Faculty

Emeritus: Harwood
Professors: Bohnsack, Carpenter, Crawford, R., Crouch, Etheridge (Chairman),
Huffman, Hunsaker, Olson, A., Wilson, W. Huffman, Hunsaker, Olson, A., Wilson, W Associate Professors: Atkins, Cohn, Coll
., McLean, Norland, Plymale
Assistant Professors: Catlett, Chen, Glenn, Jackson, C., Krekorian, Lillegraven
Lecturer: Kaston

## Offered by the Departmen

Master of Arts and Master of Science in biology, with an emphasis in zoology Major in zoology with the A.B. in liberal arts and sciences
Major in zoology with the B.S. in applied arts and sciences.
Teaching major in the biological sciences, with specialization in secondary

## Major in Zoology

## With the A.B. in Liberal Arts and Sciences

For a foreign language, French, German, or Russian is strongly recommended Preparation for the maior. Biology 1, 2, and 15; Zoology 50 and 60 or 106 ;
Chemistry $1 \mathrm{~A}-1 \mathrm{~B}$ and 11 or 12 ; Physics 1A-1B or 2A-2B; and Mater ( $38-42$ units.) Recommended: Mathematics 22 or 2A-2B; and Mathematics 21 or 40 2A-2B were taken.
Major. A minimum of 24 upper division units in biology, botany, microbiology and zoology to include the following: Biology 101 or Zoology 140; Biology 110 . 1 gy Zoology 108; Biology 156 or Zoology 102 or 103 or 103, or Microbiology 101 , or

With the B.S. in Applied Arts and Sciences
Preparation for the major. Biology 1, 2, and 15; Zoology 50 , and 60 or 106 .
Chemistry $1 \mathrm{~A}-1 \mathrm{~B}$ and 11 or 12 ; Physics 1 A , (38-42 units.) Recommended: Mathematics 22 2A-2B; and Mathematics 21 or 40 2A-2B were taken.
Major. A minimum
botany, microbiology and zoology to include units, 28 of which must be in biology botany, microbiology and zoology, to include the following: Biology 101 or Zoology
140; Biology 110 and 155; Botany 100, 101, Microbiology 101, or Zoology 108; Biology 156 or Zool; Biology 101 or 103 , or complete the major must be selected with the or Zoology 102, or 103. Units to upper division units can be in chemistry, geology, mathematics adviser; up to 8

## Teaching Major in the Biological Sciences

## For the Standard Teaching Credential

The teaching major for secondary teaching requires an undergraduate major in one of the biological sciences: biology, botany, microbiology, or zoology. Al courses in the major must have prior approval by the adviser for biological sci-
ences teaching programs. ences teaching programs.
Postgraduate Year, A minimum of six units from courses acceptable for graduate credit on a master's degree program in the biological sciences.

## Minor in Zoology

The minor consists of 15 units in biological sciences, six of which must be upper division. Approval of the zoology adviser is required.
8. Human Anatomy (4) I, 1

Two lectures and six hours of laboratory.
Prerequisite: An introductory course in high school or college biology or oology.
Systems of the human body and their interrelationships.

## 50. Invertebrate Zoology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2.
Structure, function. relationships and significance of invertebrate animals as shown through a study of selected invertebrate types.
60. Vertebrate Zoology (4) I, II

Two lectures and six hours of laboratory
Prerequisites: Biology 1 and 2.
An introductory course in the biology of the vertebres with ertebrate

## 102. Invertebrate Embryology (3)

Two lectures and three hours of laboratory
Prerequisite: Zoology 50.
Description and experimental analysis of the development of invertebrates.

## 103. Embryology (4) I, II

Two lectures and six hours of laboratory.
Prerequisite: Zoology 50, 60, or 106.
Studies in comparative gametogenesis, morphogenesis, and reproductive physiology.
106. Comparative Anatomy of the Vertebrates (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2.
Dissection, study and comparison of organ systems of typical vertebrates.

## 108. Histology (4) I,

Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2. Recommended: Zoology 8 or 60 or Microbiology 101.

The microscopic structures and differentiation of tissues and organs of the vertebrates, especially mammals.
112. Marine Invertebrate Zoology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Zoology 50 and Biology 110
Ecology, morphology, behavior, and physiology of marine invertebrates. Frequent field trips to local marine environments.

## 114. Natural History of the Vertebrates (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: One semester of college biology.
Natural history, distribution and classification of vertebrate animals; emphasis on local forms. Not open to zoology majors.
115. Ichthyology (4) I, II

Two lectures and six hours of laboratory.
Prerequisite: Zoology 60 or 106
Evolution, interrelationships, structure, identification, habits, and ecology of
fishes.
116. Herpetology (4) I

Two lectures and six hours of laboratory.
Prerequisites: Consent of instructor.
The origin, evolution, distribution, and systematics of amphibians and reptiles of
the world.

## 117. Ornithology (4) II

Two lectures and six hours of laboratory or field excursions, and a field project.
Prerequisites: Biology 1 and 2 and consent of instructor.
The study and identification of birds, especially those of the Pacific Coast and
118. Mammalogy (4) I

Two lectures and six hours of laboratory
Prerequisites: Zoology 60 or 106.
The evolution, systematics, distribution, and ecology of mammals of the world.

## 119-5. Field Zoology (4) s

Two lectures and six hours of laboratory.
Prerequisite: A course in college biological science.
havior of southern California animals. Primarily; identification, ecology, and bebiological sciences.

## 121. General Entomology (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Biology 1 and 2.
Structure, physiology, natural history, and classification of insects.

## 122. Special Topics in Entomology (3)

Two lectures and three hours of laboratory.
Prerequisite: Zoology 12 i.
Advanced treatment of some phase of entomology such as physiology, morpholcredit nine units, not more than three of which may the class schedule. Maximum
123. Immature Insects (3) II

Two lectures and three hours of laboratory.
Prerequisite: Zoology 121.
Collection, preservation, identification, and biological study of the immature stages of the different insect orders. Course designed to meet the needs immature specializing in invertebrate zoology, agricultural and medical entomology, para-
sitology, and systematics.

## 124. Insect Ecology (4)

Two lectures and six hours of laboratory.
Prerequisites: Biology 110, and Botany 100 or 103. Recommended: Zoology 50 ,
05, or 121. , or 121 .
Ecological principles as applied to insects, including consideration of systems in relation to insect and mite outbreaks.

Zoology bry x

## 125. Economic Entomology (4)

Two lectures and six hours of laboratory.
Prerequisite: Zoology 50 or 121 (preferred), or Botany 100, 103, or 162.
Course designed for students of agriculture and horticulture. Emphasis is placed on determination and control of insects affecting plants. Quarantine measures are also studied.

## 126. Medical Entomology (3) in

Prerequisite: Zoology 50, 60, or 121, or Microbiology 101.
The role of insects and other arthropods in transmission and causation of human diseases.
127. Principles of Pest Management (3)

Two lectures and three hours of laboratory.
Prerequisites: Botany 100, 103, or 162; and Zoology 121, 124. Recommended Zoology 125
Systematic analysis and synthesis of all suitable techniques known to reduce and maintain pest populations at levels below economically important injury in for estry and agriculture, based on firm ecological principles.

## 128. Parasitology (4) I, II

Two lectures and six hours of laboratory.
Prerequisite: Zoology 50 or Microbiology 101.
Study of animal parasites with special reference to those of man. Laboratory including identification of important parasites of man, and collection and preservation of local forms
130. Advanced Invertebrate Zoology (3) I, II

One lecture and six hours of laboratory.
Prerequisite: Zoology 50.
Selected topics in advanced invertebrate zoology. May be repeated with new content for a maximum of six units.

## 35. Scientific Illustration (3)

Two lectures and three hours of laboratory; field trips.
Preparation of illustrative materials, inked drawings, charts, lettering, models, still and movie photography, and photomicrography.

## 140. Physiological Zoology (4) I, II

Three lectures and three hours of laboratory
Prerequisites: Zoology 60 or 106, and Chemistry 12.
A comparative and evolutionary study of the functions of organ systems and their environmental significance.

## 45A-145B. Experimental Animal Surgery (2-2) I, II

One lecture and three hours of laboratory.
Prerequisites: A course in vertebrate anatomy and a course in animal physiology Prerequisites: A course 145 A is prerequisite to 145 B .
Fundamental principles of animal care, disease prevention, and aseptic surgery.

## 50. Marine Biology (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: Biology 1.
An introduction to marine organisms and their environment. Not open to students An introduction credit for Zoology 50 or Biology 110.

## 55. Principles of Taxonomy, Systematies and Phylogeny (4) it

Two lectures and six hours of laboratory.
Prerequisites: Any one of the following: Zoology 50, 60, 106, Botany 101, 102, 103.
Basis for the classification of organisms. Modern concepts and their application zoology. Specific problems in laboratory and field.
160. Vertebrate Paleontology (4) II

Two lectures and six hours of laboratory.
Prerequisite: Zoology 106.
Advanced studies in the evolution of vertebrates, including relations to earth history and topics in paleoecology and functional morphology. Laboratory emphasizes field and preparatory techniques and identification of mammalian fossils.

## 170. Animal Behavior (4) I, II

Two lectures and six hours of laboratory.
Prerequisites: Zoology 50 and 60 or Psychology 40, 50, and consent of instructor. Biological bases of animal behavior with emphasis on the ethological approach, including the evolution and adaptive significance of behavior.

## 172. Neurobehavior (4) II

Two lectures and six hours of laboratory.
Prerequisites: Zoology 170 or Psychology 113 or 114, and consent of instructor. Evolution of the senses and central nervous system and their significance in animal behavior. Invertebrates and lower vertebrates will be emphasized. Advanced laboratory training in neurophysiology and psychobiology.
190. Senior Investigation and Report in Invertebrate Zoology (2)

Prerequisite: Consent of instructor.
Investigation and reports on the current literature of invertebrate zoology.
191. Senior Investigation and Report in Vertebrate Zoology (2)

Prerequisite: Consent of instructor.
Investigation and reports on the current literature of vertebrate zoology.
198. Methods of Investigation (2) I, II

One discussion and three additional hours to be arranged.
Prerequisite: Consent of instructor.
Selection and design of individual research in zoology; oral and written reports. Four units maximum credit for Zoology 198 or a combination of this course with Biology or Microbiology 198.

## 200. Seminar (2 or 3)

201. Seminar in Marine Zoology (2)
202. Seminar in Vertebrate Morphology (2)
203. Seminar in the Biology of Cold-blooded Vertebrates (2)
204. Seminar in the Biology of Warm-blooded Vertebrates (2)
205. Animal Energetics (3)
206. Advanced Marine Invertebrate Zoology (3)
207. Bibliography (1)
208. Research Techniques (3)
209. Research (1-3)
210. Special Study (1-3)
211. Thesis (3)

## Professional Schools: Courses and Curricula

## School of Business Administration

Robert R. Hungate, Dean; Maurice L. Crawford, Associate Dean; Thomas R. Wotruba, Assistant Dean for Graduate Studies

## Accreditation

The School is a member of the American Association of Collegiate Schools of Business.

Bureau of Business and Economic Research
The Bureau of Business and Economic Research is an organized research activity serving the needs of the School. Its chief purpose is to facilitate research by faculty and students in the areas of economics and business. For further information, see "Research Bureaus" in the catalog section, Introducing San Diego State.

## Faculty

Accounting Department
Emeritus: Brown, E. P., Wright
Professors: Brodshatzer, Ferrel, Harned (Chairman), Odmark, Scorgie, Snudden Associate Professors: Bailey, A., Dodds, Wade, Williamson, J.
Assistant Professors: Lightner, Purcell

## Finance Department

Professors: Chapman, Hippaka, Hungate, Nye, Reznikoff
Associate Professors: Fisher, H., Reints (Chairman), Wijnholds, H. W.
Assistant Professors: Block, Dee, Fisher, R. T., Hird, Hutchins, Neuberger, Schmier, Shutt, Smith, Charles R., Vandenberg, Yankey

Information Systems Department
Professors: Archer, Crawford, M., Gibson, Langenbach (Chairman), LeBarron, Pemberton, Straub
Assistant Professors: Chrysler, Mahoney, Spaulding, Sponseller, Tilaro
Lecturer: Brereton

## Management Department

Emeritus: Torbert
Professors: Belcher, Hampton, Peters, Pierson, Srbich
Associate Professors: Atchison (Chairman), Galbraith, Ghorpade, Mitton, Sherrard
Assistant Professors: Price, K., Steinhorst, Walker, J.
11-81517

## Marketing Department

Emeritus: De Julien
Professors: Barber, Darley, Hale, Sharkey, Wotruba
Associate Professors: Akers, Haas, McFall, Lindgren (Chairman)
Assistant Professors: Soldner, Vanier
Lecturer: Wijnholds, H. deB

## Offered by the School

Master of Business Administration
Master of Science in Business Administration
B.S. in business administration, majoring in accounting, finance, information systems, insurance, management, marketing, and real estate
Minors in accounting, business management, employee relations, finance, informa-
tion systems, insurance tion systems, insurance, marketing, production and operations management, and
real estate real estate
Teaching major and minor in business with specialization in secondary teaching For detailed information on the Master of Business Administration and the Master of Science in Business Administration degrees, see the Graduate Bulletin.

## Accounting

## Majors

Preparation for the major. Business Administration 1A-1B, 30A, 80, 83; Economics 1A-1B, Economics 2 or Mathematics 12, and Mathematics 20 ( 25 units) meet general education requirem course in business administration or economics to outside these areas.
Maior. Thirty-nine upper division units to include Business Administration 100, 102, 106, 126, 132, 150, 190 and Economics 100A or 100B; and 12 units selected from the following: Business Administration 101, 107, 108, 112, 114, 115, 118, formation systems, management, and marketing one course each from finance, in-
In addition to units in
In addition to units in general education and to upper division units in the momics are required, Lower division units outside of business administration and ecounits are in one foreign language.

## Finance

Preparation for the major. Business Administration 1A-1B, 30A, 80, 83; Economics 1A-1B; Mathematics 20; and Economics 2 or Mathematics, 12 ( 25 ; units).
Students who expect to use any course in business and Students who expect to use any course in business administration or economics to outside these areas.
Maior. Forty upp
M27ajor. Forty upper division units to include Business Administration 100, 126 selected from Business Administration 129 and 197, and 135, at least three units selected from business administration and economics courses with tsols elective adviser. Fifty-two units ( 12 of which must be upper division) must be taken the side business administration and economics.

## Information Systems

Preparation for the major. Business Administration 1A-1B, 30A, 80, 83, and 84 Economics 2 or Mathematics 12; Economics 1A-1B; Mathematics 20 and and 84 units). Students who expect to use Business Administration 30A or Economics 1A courses outside business administration and economics.

Major. A minimum of 34 upper division units to include Business Administration 102, $126,132,135,150,184,185,186,187,188$, and 190 ; six units of electives selected from Business Administration 128, 131, 134, 140, 163, 182, 183, and 189.
General electives. In addition to the requirements stated, the student must select up to 17 units to complete the required total. At least nine of these must be in upper division courses outside of business administration or economics.

## Insurance

Preparation for the major. Business Administration $1 \mathrm{~A}-1 \mathrm{~B}, 30 \mathrm{~A}-30 \mathrm{~B}, 80,83$; Economics 1A-1B; Economics 2 or Mathematics 12, and Mathematics 20 ( 28 units). Students who expect to use any course in business administration or economics to meet general education requirements must complete compensating units in course outside these areas.
Major. Thirty-nine upper division units, to include Business Administration 120 121, 124, 125, 126, 132, 150, and 190, and 15 units selected from Business Administration 106, 107, 128, 131, 140, 170, 171, 172, 173, 174, 175, Economics 111, 131, 135 142, 170, 171. Fifty-two units (twelve of which must be upper division) must be taken outside of business administration and economics.

## Management

The major in management is offered in three areas of concentration: business management, employee relations, and production and operations management. Students must complete all three of the following requirements.

## (1) Professional Curriculum Within the Major Field

Preparation for the major. Business Administration 1A-1B, 30A, 80, 83; Economics $1 \mathrm{~A}-1 \mathrm{~B}$; Mathematics 12 and 20 ( 25 units).
Major. Business Administration 102, 126, 131, 132, 134, 135, 140, 145, 149, 150, 190 and Economics 100A (37 units).
(2) Areas of Concentration Within the Major Field

Select one area:
(a) Business Management. Twelve units made up of one upper division three unit course from each of four of the following fields: accounting, business law economics, employee relations, finance, insurance, marketing, production management, purchasing, and real estate.
(b) Employee Relations. (1) At least six units from Business Administration 141, 142, and 143; and (2) six units from Economics 150, 152, Psychology 105, 121, 124,133 , and Sociology 120 . ( 12 units.)
(c) Production and Operations Management. (1) Business Administration 136 and either 137 or 138 ; and (2) six units from Business Administration 162, Eco nomics 107, Mathematics 130B, Philosophy 121, 122, Psychology 121, 124. (12 units.)
(3) Pattern Requirements Outside the Department of Economics and the School of Business Administration
A minimum of 16 units of pattern requirements must be taken. These requirements are met by taking a minimum of eight units in the area of Life, Physical, and Social Sciences as indicated in (a) below and a minimum of eight units in the area of Humanities and Fine Arts as indicated in (b) below. These requirements may also be met by completing the two year AFROTC program of upper division aerospace studies courses.
Courses taken to satisfy the requirements shown in (a) and (b) below are in ddition to and may not be used to satisfy any requirements in general education nor may they be used to satisfy requirements sțated in (1) and (2) above.
(a) Life science, physical science, and social science. A minimum of eight units, to be selected with the approval of the departmental adviser, from one department in the College of Sciences or the departments of Geography, Political Science, and Sociology. All upper division courses in the specified departments are suitable as well as the following lower division courses: Chemistry 1A-1B, 4, 5; Mathematics
50, 51, 52; Physics 4A-4B-4C.
(b) Humanities and fine arts. A minimum of eight units, to be selected with the approval of the departmental adviser, from one department in the College of Arts and Letters (except Economics, Geography, Political Science, and Sociology) or the College of Professional Studies (except Aerospace Studies, Industrial Arts, and Physical Education). All upper division courses in the specified departments are suitable as well as the following lower division courses: Art 5, 50A-50B, 52A-52B, Music 52, Speech Communication 4, 60, 62, and 64. All courses in a foreign language are acceptable, but at least eight units must be taken in one language.

## Marketing

Preparation for the major. Business Administration 1A-1B, 30A, 80, 83; Economics $1 \mathrm{~A}-1 \mathrm{~B}$; Mathematics 20; and either Economics 2 or Mathematics 12 (25 units.). Students who expect to use any course in business administration or economics to meet general education requirements must complete compensating units in courses outside these areas.
Major. Thirty-seven upper division units to include Business Administration 126, $132,149,150,151,156,157,158$, and 190; six units selected from Business Ad-
ministration 152, 153,154, 159, 161 162, 163, ministration $152,153,154,159,161,162,163,164,165 ;$ and six units selected to the upper division units in the major and in general education, 12 upper division elective units outside of business administration and economics are re quired.

## Real Estate

Preparation for the major. Business Administration 1A-1B, 30A-30B, 80, 83, Economics 1A-1B, Economics 2 or Mathematics 12, and Mathematics 20 ( 28 units).
Students who expect to use Economics 1A or Business Administration 30A to meet general education requirements must complete compensating units in courses outside business administration and economics.
Major. Thirty-nine upper division units to include Business Administration 126, 132, 140, 150, 170, 171, 172, 173, 174, and 190, Public Administration and Urban tudies, 160; and six to seven units selected from Business Administration 100, 106, must be upper division) and must be taken outsidy two unis (twiness administration economics.

## Minors

These minors are for students whose majors are outside of business administra tion. They all require Business Administration 1A-1B.
Accounting: 15 units required of which 11 must be upper division, including
Business Administration 100 .
Business management: 19 units required, including Economics 1A-1B; nine units must be upper division, including Business Administration 132.
Employee relations: 19 units required, including Economics $1 \mathrm{~A}-1 \mathrm{~B}$; nine units must be upper division, including Business Administration 132 and 140 . nine units
Finance: 16 units required, including Economics $1 \mathrm{~A}-1 \mathrm{~B}$ and 135, and Business dministration 132.
Information systems: 22 units required, including Mathematics 21, Business Ad-
ministration 83,84,185, 186, and 187.
Insurance: 19 units required, including Business Administration 30A-30B; 120; 121 or 124; and three additional upper division units in business administration.

Marketing: 19 units required, including Economics 1A-1B, Business Administration 150, and six additional upper division units in business administration.
Production and operations management: 19 units required, including Economics 1A-1B, Business Administration 132 and 135, and three additional upper division 1A-1B, Business Administration

Real estate: 19 units required, including Business Administration 30A-30B, 170, and six additional upper division units in business administration.

## Teaching Major and Minor

Requirements for the teaching major in business are the same as those for the major in information systems, those for the teaching minor in business the same as those for the minor in information systems. In addition, to prepare for secondary teaching, the student must take in his postgraduate year six units in courses accept able for the credential. For additional specific requirements for a teaching credential, see "School of Education" in this catalog section.

## 1A-1B (4) or 1A-1B (2-2). Accounting Fundamentals. I, II

Three hours of lecture and laboratory per two units of credit.
Prerequisite: Business Administration 1A is prerequisite to 1 B .
Organizing, recording, and communicating economic information relating to the business entity.

## 30A. Business Law (3) I, II

Introduction to legal institutions; nature and sources of law; the judicial system; legal concepts and cases involving contracts, agency, and sales.

## 30B. Business Law (3) I, II

Prerequisite: Business Administration 30A.
Legal concepts and cases to be selected from business organization, negotiable instruments, property, security devices, creditors' rights and bankruptcy, trade reg ulation, and labor law. Students preparing for public accounting should take Busi ness Administration 118 instead of 30 B
40. The Business Enterprise (3) I, II

Not open to students who are majors or minors in any department of the School of Business Administration.
The business enterprise and its function in society; interrelations of ownership entrepreneurship, and administration; interactions within the firm and within and among industries.

## 71. Beginning Typowriting (2) 1, II

Four hours. Fundamentals of typewriting. Development of
students with credit for high school typewriting.

## 72. Advanced Typewrifing (2) I, it

Four hours.
Application of typewriting skills in solution of typical business problems.

## 73. Computational Machines Laboratory (1) I, II

Two hours of laboratory.
Laboratory course in figuring and calculating machine principles and operation.

## 14. Communicative Machines Laboratory (2) i,

Four hours of laboratory.
Prerequisite: Business Administration 71.
Laboratory course in communication and duplicating machine principles and operation.

75A-75B. Shorthand (3-3) I, II
Five hours of lecture and activity.
Prerequisite: Business Administration 72; 75A is prerequisite to 75B.
Gregg shorthand theory; dictation and transcription.

## 76. Advanced Shorthand (3) I

Prerequisites: Business Administration 75A and 75B.
Development of speed in writing and transcription.

## 80. Written Communieations in Business (3) I, II <br> Prerequisite: English 5.

Principles of effective writing applied to business and industrial situations and to the organization and presentation of reports.
83. Information Processing and Computer Programing (3) I, II

Two lectures and three hours of laboratory.
Introduction to concepts of information processing and computer programing.

## 34. Systems Programming (3)

Prerequisite: Business Administration 83.
The theory and techniques of data manipulation, utilizing a problem-oriented anguage.
100. Intermediate Accounting (4) I, II

Prerequisite: Business Administration 1B.
Theories and principles underlying financial statements and determination of income of partnerships and corporations.

1. Specialized Accounting Problems (4) I, it

Prerequisite: Business Administration 100
Problems involved in partnerships, consignments, consolidations, receiverships, foreign exchange, fund accounting, and other specialized areas.

## 102. Managerial Cost Accounting (4) I, II

Prerequisite: Business Administration 1B.
Management use of accounting data for planning and control; theories and practices of cost accounting, standard cost systems, distribution analysis, and
06. Income Tax Accounting (4) it

Prerequisites: Business Administration 1A and 1B
Theory and procedures in the preparation of federal and California income tax returns for individuals, partnerships and corporations.

## 107. Advanced Income Tax Accounting (2) $\mathbf{1}$, II

Prerequisite: Business Administration 106.
Theories of taxation as related to personal holding companies, corporate distri of gift, estate and social security taxes.

## 108. Governmental Accounting (2) I, II

Prerequisite: Business Administration 100.
Principles of fund accounting useful in state and local governmental units, hospitals, colleges, and universities. Comparisons with commercial accounting emphasized. Includes study of budgetary accounting, appropriations, encumbrances,

## 112. Auditing (4) I, II

Prerequisites: Business Administration 101 and 102.
General principles and concepts of auditing; consideration of the design of accounting systems; duties, ethics, and responsibilities of the auditor; procedures
for verification of financial statements; auditor's reports.
14. Accounting Systems (3) I,

Prerequisite: Business Administration 100 and 102
General system theory and system terminology. New mathematical and statistical rechniques for solving special system problems. Planning, controlling, and reporting procedures will be developed for accounting systems employing the use of digital computers.
115. Accounting Theory (3) I, II

Prerequisites: Business Administration 100 and 102 and one other upper division course in accounting.
Critique of contemporary accounting theory; recommendation for improvement of financial accounting; research in accounting theory.
118. Advanced Business Law (3) I, II

Prerequisites: Business Administration 30A and a major in accounting with at least 9 units in upper division accounting.
Legal concepts and cases involving, business organization, negotiable instruments, property, security devices, creditors' rights, bankruptcy, insurance, wills, trusts, estates, and suretyship. Special emphasis on problem-solving techniques. Not open
119. Advanced Accounting Problems (3) I, II

Prerequisite: Business Administration 112
An intensive review of the accounting principles and procedures covered in the ccounting theory and accounting practice sections of the uniform C.P.A. examina-
120. General Insurance (3) I, II

History of insurance; economic and social implications; principles of insurance解 and policies including life, fire, marine, inland marine, casualty and surety bonding.
121. Property and Casualty Insurance (3) II

Prerequisite: Business Administration 120.
All standard forms of insurance except life; includes automobile, liability, workmen's compensation and disability, fire, marine, and inland marine, Legal interpremation of conervision and control
124. Life Insurance Principles and Practices (3) I

Prerequisite: Business Administration 120.
Economic and social aspects of life insurance; nature of life insurance and annuity ontracts; basic legal principles; theory of probabilities, premiums, reserves, and onforfeiture values; company operational activities; agency development and management.
125. Estate Planning (3) I, II

Programming fundamentals with emphasis upon economic, actuarial, and legal rinciples, program coordination and integration with wills; guardianships; estate selling as a career.
126. Fundamentals of Finance (3) $\mathbf{I}, \mathbf{I I}$

Formerly Business Administration 127.
Prerequisite: completion of lower division course requirements in major or minor.
Objectives of financial management. Financing the business enterprise. Internal financial management. Introduction to the cost of capital, valuation, dividend policy, leverage and the techniques of present value and its applications. Sources of capital.
127. Planning of Capital Expenditures (3) I, II

Prerequisites: Business Administration 126 and credit or concurrent registration in 190.
The capital expenditure decision process. Measuring and evaluating benefits and Risk and uncertainty in the decision process process. Capital rationing problems. puter methods in the decision-making process. Emphasis on quantitative and com-
128. Investments (3) I, II

Prerequisite: Business Administration 126.
Investment principles, and practices with emphasis upon problems of the small investor, such as tests of a good investment, sources of information, types of stock and the like.

## 129. International Business Finance (3) I, I

Prerequisite: Business Administration 126.
The financing of international business transactions; international payments and
their environment; international financial institutions.
130. Financial Analysis and Management (3) I, II

Prerequisites: Business Administration 127 or 1 A and 1B, and Economics 135.
Evaluation of conditions and trends in the money and capital markets. Utilization of financial data as related to the problems of business enterprises. Emphasis on

## 131. Law in a Business Society (3) I, II

Prerequisite: Business Administration 30A.
The nature of law as a process of resolving economic disputes and social conof law in the development of business concepts.
132. Fundamentals of Management (3) I,

Prerequisite: Completion of lower division courses required in the major or minor.
What a manager does, how he selects objectives, organizes essential activities, plans, directs and controls operations; fundamentals which guide a manager's de-
134. The Social Environment of Business (3) I, II

Prerequisite: Senior standing.
An interdisciplinary study of American business enterprise in its cultural environment. The foundations of business; historical modifications; present relationship between business and society. The moral and ethical responsibilities of business and
the businessman. the businessman.

## 135. Fundamentals of Production and Operations Management (3)

Two lectures and three hours of laboratory.
Prerequisite: Business Administration 132.
Theory, concepts and decision analysis related to effective utilization of major factors of production in manufacturing and service industries. Study of produc systems.

## 136. Production and Quality Control (3) I, II

Prerequisites: Business Administration 135 and 190.
Forecasting, planning and controlling production flow; techniques for planning and controlling quantitative methods particularly applicable to scheduling and control

## Business

## 137. Motion and Time Study (3) I, II

Two lectures and three hours of laboratory.
Prerequisite: Business Administration 135.
Work simplification through methods improvements; operations analysis; flow charts, calculation of time standards; work and speed analysis; new developments in job timing, standard setting and motion economy study

## 138. Systems and Data Analysis (3) I, II

Prerequisites: Business Administration 83 and 132.
The methods and concepts of gathering information, analyzing and reducing data, and preparing accounts and timely reports to management. Unified operations manon of systems for managerial efficiency. Not open to students with credit for Business Administration 185.

## 140. Employee Relations (3) I, II

Prerequisite: Business Administration 132.
Problems of business and industry in dealing with employees, special attention to company and public policy, staffing, employee development, labor relations and employee motivation. Comparisons of current practices to underlying problems and theories.

## 141. Employee Relations Laboratory (1) I, il

Three hours of laboratory.
Prerequisite: Credit or concurrent registration in Business Administration 140 or Political Science 144, or consent of instructor.
Investigation of employee relations practices and policies. Practice in interviewing, role playing, or in conducting field studies and related personnel research.

## 142. Wage and Salary Administration (3) I, II

Prerequisite: Business Administration 140.
Major problems in the determination and control of compensation from employment. Comparison of underlying theory to current practice.

## 143. Problems in Employee Relations (3) II

Prerequisite: Business Administration 140
The employee relations function. Analysis of current practices as effective solutions to problems in this area. Guided research into the nature of employment relations.
145. Human Factors in Management (3) I, II

Prerequisite: Business Administration 132 or Political Science 144.
Organizations as social systems; power and authority; communication, motivation and leadership; impacts of technology on management and workers, resistance to
change; human needs and the imperatives of management.

## 149. Business Policy (3) I, II

Prerequisites: Senior standing and consent of instructor.
Formulation and administration of policy; integration of the various specialties in business; development of over-all management viewpoint.

## 150. Marketing Principles (3) i, in

Prerequisites: Economics 1A and 1B.
Marketing functions, activities of producers, wholesalers, retailers and other middlemen; channels of distribution; integration of marketing activities; price policies; government regulation.

## 151. Marketing Management (3) I, II

Prerequisites: Business Administration 150 and 190.
The managerial aspects of marketing. The development of marketing strategy and plans with the aid of social science concepts. Integrates the specific elements of the marketing function.

Prerequisite: Business Administration 150
Study of retail stores, emphasizing the problems of store managers and merchan dising executives; store location, organization, personnel, sales promotion, buying and handling of merchandise, inventory, turnover, and control methods. Problems of profitable operation under changing conditions.

## 53. Advertising Principles (3) I, II

Prerequisite: Business Administration 150.
Advertising as a sales promotional tool in marketing activities; consumer, marker ment of advertising relations; advertising campaigns. economic and legal aspects of advertising; public
154. Marketing Problems (3) I, II

Prerequisite: Business Administration 150 .
Complex cases in marketing involving analysis of business situations.
156. Consumer Behavior (3) I, II

Prerequisite: Business Administration 150.
velopmentination of the nature of markets and of the factors influencing market dethe selling-buying process.

## 157. Marketing Research (3) I, II

Prerequisites: Business Administration 150 and 190
Formal research techniques and analysis for marketing decisions; principles of
decision making. decision making.
158. Marketing Research Laboratory (1)

Three hours of laboratory
Prerequisites: Business Administration 157
Applications of market research techniques to selected topics. Uses and limita tions of various methods of analysis. Orientation and use of computer center is
included.

## 59. Analysis of Marketing Information (3) I, II

Prerequisites: Business Administration 150 and 190 .
making procedures used

## 161. Traffic Management (3) I

Prerequisites: Economics 1A and 1B or 103A and 103B
freight rates and classifications, receivicic department, routing policy on shipments, warehousing, packing and loading, documentationping, loss and damage claims, government regulations.
162. Industrial Marketing (3) I, II

Prerequisites: Business Administration 132 and 150
Study of industrial products and services and how they are marketed; classifica tions of industrial products and customers; buying procedures; applications of
marketing research; analysis of industrial product platict marketing research; analysis of industrial product planning; industrial channels of
distribution; industrial promotion applications and pricing practices

## 163. Sales Management (3) I, II

Prerequisites: Business Administration 150.
Consideration of the structure of sales organizations; sales policies sele training, compensation, evaluation and control of the sales force; sales analys sales costs and budgets; sales quotas; sales costs and budgets; markets and product force; sales analysis;
co-ordination of personal selling with other forms of sales effort.
164. Purchasing and Buying (3) I, II

Prerequisites: Business Administration 132 and 150
Policies for purchasing raw materials, parts, supplies and finished goods fo manufacturing operations, for commercial uses, and for wholesale and retail resale. Buying procedures, inventory control, vendor relations, legal problems, quality control, financing
165. International Marketing (3) II

Prerequisite: Business Administration 150.
Bases and promotion of foreign marketing; foreign marketing organizations and methods, ganization and trade channels. Determinants and principles of foreign marketing policies.

## 70. Real Estate Principles and Practices (3) I, II

Prerequisites: Economics 1A and 1B or 103A and 103B.
Functions and regulation of the real estate market; transfers of property; in cluding escrows, mortgages, deeds, title insurance; appraisal techniques; financing methods; leases; subdivision development; property management.
171. Law of Real Property (3) I, II

Legal theory and practice of estotes in land relationships land transactions; mortgages and trust deeds; easements; land use; ownership rights in land; public land law.

## 172. Property Investment and Management (3) I,

Prerequisite: Business Administration 170
The rental markets, property management programs, collection procedures, lease forms, tenant and owner relations, rental techniques, maintenance and rehabilitation procedures, and investment property analysis.

## 173. Real Estate Finance (3) I, II

Prerequisites: Economics 1A, 1B, (or 103A, 103B), Business Administration 30A 30 B , and 170 .
Methods of financing real estate; sources of real estate credit; loan servicing; governmental financial agencies; acquisition and sale of mortgages and trust deeds.

## 174. Real Estate Appraisal Theory (3) I, II

Prerequisites: Business Administration 170.
Introduction to theories, functions, and purposes of appraisals of residential and income properties: Methods of valuation, techniques of market data analysis, re habilitation estimates.
175. Real Estate Appraisal Problems (3) II

Prerequisite: Business Administration 174.
Implementation of advanced value theory and appraisal technique in the solution of valuation problems involving condemnation, and industrial, commercial, land and special purpose properties.
180. Workshop in Business Education (2) S

Developments in business education areas such as (A) bookkeeping, (B) disrributive and basic business education, (C) secretarial, and (D) typewriting. Opportunity provided for work on individual problems. May be repeated with new subject matter to a total of eight units.

## 182. Consumer income Managomont (3) i, it

Functions and responsibilities of consumers; problems of choice-making; planning expenditures for housing, household operation, insurance and investments. Economics of installment buying, borrowing procedures, control of frauds, legis lation affecting consumers.
183. Executive Secretarial Management (3) II

Prerequisites: Business Administration 72, 74, and 75B.
Executive secretarial responsibilities and functions, including a review for the Certified Professional Secretary Examination.
184. Information Systems Management (3) I, II

Prerequisite: Business Administration 83; Economics 2 or Mathematics 12.
Administrative theories as they apply to typical information systems; interrelationship of personnel, equipment, and services; emphasis on quantitative and
qualitative aspects of information systems. qualitative aspects of information systems.
185. Automated Management Information Systems (3) I, II

Prerequisites: Required lower division courses of any business administration major or minor.
Concepts and techniques for the design, development, and implementation of EDP-based management information systems to improve decision making.
186. Information Storage and Retrieval Systems (3) I, II

Prerequisites: Business Administration 185, Mathematics 21.
Systems for abstracting, storing, and retrieving information with automated equipment. (Formerly numbered Business Administration 187.)
187. Advanced Programming Techniques (3) 1 , II

Prerequisites: Business Administration 84 and 185.
Software packages utilized in EDP systems in business. (Formerly numbered
Business Administration 188.)
188. Data Processing Practicum (3) I, II

Prerequisites: Business Administration 186, 187, 190.
Fundamentals of systems flow charting and computer programming; compute applications to typical automated data processing problems. (Formerly; computer
Bumbered Business Administration 186.)
189. Scope and Function of Business Education (3) I

Philosophy, scope, and functions of business education; analysis and developmen curricula; instructional foundations of basic business subjects.
190. Quantitative Analysis for Business (3) I, II

Prerequisites: Mathematics 20; Mathematics 12 or Economics 2
Quantitative methods applied to business decision making.
191. Quantitative Methods (3)

Prerequisite: Business Administration 190
A study of various management science techniques such as simulation, transpor tation and simpler linear programming and queuing theory.

## 192. Advanced Quantitative Methods (3)

Prerequisite: Business Administration 191
The derivation and application of management science techniques to management decision making. Simulation of static and dynamic models. Development of ad-
vanced linear and nonlinear programs.
197. Business Forecasting (3) I, II

Prerequisite: Business Administration 126.
Business fluctuations; forecasting, and related problems confronting the business firm; forecasting techniques; specific forecasts. The use of forecasts in the firms
198. Investigation and Report (1-3) I, II

Prerequisites: Senior standing and consent of instructor.
May be repeated to a maximum of six units.
A comprehensive and an original study of a problem connected with business under the direction of one or more members of the business administration staff.

## Business

200. Financial Accounting (3)

201A. Organization Theory (3)
2018. Behavior in Organizations (3)

202A-202B. Quantitative Methods (3-3)
203. Marketing (3)
204. Law for Business Executives (3)
205. Financial Principles and Policies (3)
206. Managerial Economics (3)
207. Research and Reporting (3)
208. Managerial Accounting (3)
209. Computer Programming and Systems Analysis (3)
210. Theory and Analysis of Financial Statements (3)
211. Advanced Accounting (3)
212. Income Tax Accounting (3)
213. Auditing (3)
214. Seminar in Accounting Information Systems (3)
219. Seminar in Accounting Theory (3)
220. Legal Aspects of Labor-Management Relations (3)
221. Insurance Principles and Practices (3)
223. Seminar in Business Finance (3)
224. Seminar in Investments (3)
225. Seminar in Insurance (3)
228. Seminar in International Business Finance (3)
229. Seminar in Financial Markets (3)
230. Production and Operations Management (3)
231. Advanced Methods Engineering and Work Measurement (3)
232. Quality Control (3)
233. Inventory and Production Control (3)
234. Seminar in Production and Operations Management (3)
236. Operations Research (3)
237. Computer Implemented Optimum Seeking Methods (3)
238. Management Systems and Simulation (3)
239. Seminar in Management Science (3)
240. Seminar in Manpower Planning and Staffing (3)
241. Seminar in Union-Management Relations (3)
242. Seminar in Compensation (3)
243. Seminar in Organizational Development (3)
249. Seminar in Human Resources Administration (3)
250. Seminar in Marketing and the Economy (3)
251. Seminar in Marketing Theory (3)
252. Marketing Institutions (3)
253. Seminar in Marketing Price Policy (3)
254. Seminar in Sales Management (3)
255. Seminar in International Marketing (3)
256. Seminar in Consumer Behavior (3)
257. Seminar in Industrial Marketing M
259. Ma (3)
260. Principles of Real Estate (3)
261. Seminar in Real Estate (3)
262. Seminar in Real Estate Investment (3)
263. Seminar in Real Estate Finance (3)
264. Seminar in Valuation of Real Property (3)
270. Seminar in Business Education (3)
273. Seminar in Information Storage and Retrieval (3)
274. Seminar in Advanced Computer Applications (3)
278. Seminar in Management of Information Systems (3)
279. Seminar in Data Systems Design (3)
281. Behaviorial Sciences for Management (3)
282. Group Processes and Leadership (3)
283. Origins and Nature of American Business Enterprise (3)
284. Policy Formulation (3)
285. Seminar in Business Planning (3)
289. Seminar in Organization and Management (3)
290. Directed Readings in Business Administration (3)
297. Research (3)
298. Special Study ( $1-3$ )
299. Thesis (3)

Some of the qualities sought for in candidates by the Admissions Committee of the school are above average intelligence, superior scholarship, professional aptitude, wholesome personality and good character, sound speech and language habits reading. reading.
Specifically, the following are the factors the Admissions Committee considers
in deciding whom to admit: in deciding whom to admit:

1. A satisfactory score on the college aptitude test taken at the university
2. Competence in the use of English and satisfactory ability in arithmetic, handwriting, reading and spelling as indicated by scores on fundamentals tests for
those applying for elementary education. (See the those applying for elementary education. (See the academic calendar for dates of these tests which should be taken in the second semester of the freshman
year.)
year.
3. Satisfactory scores on The Comprehensive College test for secondary and community college teaching. (See the academic calendar for dates of these
4. Satisfactory quality of speech prior to the junior year.)
5. Satisfactory quality of speech and voice control.
6. Results of the college health examination given for teaching credential candi-
.
7. Interviews with representatives of the Admissions Committee and, for secondary education only, with a representative of the department in which the
student is a major. stadent is a major.
8. Satisfactory grade point averages on the first two years or more of a given curriculum and on all subsequent work taken for the credential. Minimum
grade point averages are indicated below: a. Flementragy tesce indicated below:
a. Elementary teaching, 2.20.
. Health and development credential, 2.20 .
c. Secondary teaching, all subjects, 2.50 , and major field, 2.75 .
d. Junior college teaching, 2.50.
9. For administration, supervision, and pupil personnel services credential candidates, a satisfactory grade point average (minimum 2.75) on all work applic
10. For secondary teaching candidates the work applied to the basic credential proved by the authorized departmental representative in the student's major field and by a representative in secondary education.
11. A transcript of all work completed at other institutions must be filed with the
secondary education department. secondary education department.

## Requirements for Degrees

Requirements and descriptions of the Master of Arts in education, with con centrations in ten areas, and of the Master of Science in counseling are to be found in the Graduate Bulletin
The Bachelor of Education degree is intended for teachers holding provisiona prem or elementary credentials.
In addition to the requirements listed in "Graduation Requirements" in the cataeach of four of the following fields candidate must complete at least two units in physical education, mathematics, music, natural sciend speech, health science and ing geography). He must complete a majur of including courses from each of the following areas: elementary school, principles of elementary education, child psychaching in the structional media. He may receive four units for each year of verified succesfful teaching to a maximum of eight units applicable on the degree. Up may be earned by examination in lieu of the courses in the areas listed. 30 units
Bachelor of Vocational Education. This degree is a
teachers recommended by the Board of Examiners for Vocational Edo vocational requirements are the same as those for the A.B. in ar Vocational Education. The specific program to be followed is to be selected with the approval of the D. The the School of Education.

## Requirements for Credentials

Any one wishing to teach or provide other types of professional service in the public schools of California must hold a credential issued by the State Depart ment of Education. San Diego State has authority to recommend applicants for various credentials. They are as follows:

Credential
(1) A standard teaching credential with specialization in:
(a) Elementary teaching

Teach kindergarten and grades one through nine
(b) Secondary teaching Teach major and minor in grades seven
(c) Community college teaching
(2) A standard designated services credential
(3) A standard supervision credential
(4) A standard administration credential
(5) A restricted
credential
through twelve
Teach major in community college
Perform pupil personnel services or health services as specified on the credential
Serve as supervisor, consultant, or other inter mediate administrative position including school principal

Serve as a district superintendent or in intermediate level administrative positions, including those services authorized by the standard supervision credential
Serve as a speech and hearing specialist at all grade levels

By completing specialized preparation, additional authorization may be earned to qualify one as (1) Teacher of Exceptional Children: Deaf or Severely Hard of Hearing, (2) Teacher of Exceptional Children: Handicapped in Speech or Hearing, (3) Teacher of Exceptional Children: Mentally Retarded-for all grade levels, kindergarten through grade fourteen, or (4) School Librarian, for service as librarian and teacher of librarianship in kindergarten and grades one through fourteen.
Recent legislation will change many of the current requirements for credential as described here. Any person who, on November 1, 1971, has completed two year of college and on that date is enrolled in a teacher education program, will have until September 15, 1974, to complete the current requirements.
After an interval of five years, courses in education are reevaluated and subject to reduction in credit, in light of such new requirements as may have been put into effect and changes in educational procedures. .

## Standard Teaching Credential

To be recommended for this credential, an applicant must have a bachelor's degree with 40 units in general education plus a fifth postgraduate year. It provides for specialization either in elementary or in secondary teaching.
For specialization in elementary teaching, the student must include in his course n 111, 112, 131, 132, and 101 or 202; Geography 1 and 150; Mathematics 10; Music 2; and Physical Education 53 ; and have a major in one of the following:

| Art | Fine Arts and |
| :--- | :--- |
| Biology | Social Sciences |
| Botany | French |
| Chemistry | Geography |
| Economics | Geology |
| English | German |
| Fine Arts | History |
| Fine Arts and | Mathematics |
| Humanities | Music |

Physical Science
Physics
Political Science
Social Sciences
Sociology
Spanish
peech Communication
Zoology

To be recommended for the secondary specialization, the student must have Education 100, 110, 121, 180A-B-C-D and 252, and Health Science and Safety 151; and a major in one of the following:

| Art | German | Physical Sciences |
| :--- | :--- | :--- |
| Biological Sciences | Health Sciences | Physics |
| Business | History | Psychology |
| Chemistry | Home Economics | Russian |
| Drama | Industrial Arts | Social Sciences |
| English | Mathematics | Spanish |
| French | Music | Speech |
| Geography | Physical Education |  |

## Interdepartmental Majors

The requirements for the departmental majors are described with each department in the catalog section Courses and Curricula. The requirements for interdepartmental majors are as follows:

## Fine Arts, for Elementary Teaching

Preparation for the major. Art 1A and 2A; Music 2, 10A, 10B, 10C; and Speech Communication 3. (14 units)
Teaching Major. A minimum of 26 upper division units to include six units selected from Art 110, 117A or 119A, 118, and 108 or 156 A; Music 144, 145, 146. either one course selected from Art $106 \mathrm{~A}, 111 \mathrm{~A}, 117 \mathrm{~A}, 120 \mathrm{~A}$ or two units from Music 170 through 188; nine units selected from Drama 110, 120, 122, 132, 140A, 142 (maximum 3 units), 152A, 160A, Telecommunications and Film 180.

## Fine Arts and Humanities, for Elementary Teaching

Preparation for the major. Courses must be selected from the same two areas as those to be used for the upper division concentrations: Art 1A, 2A; Drama 8,
Speech Communication 3; or Music 2, 10A, 10B, 10C; plus six units in either English or philosophy.
Teaching Major. A minimum of 24 upper division units to include nine units selected from Art 110, 118, 117A or 119A, 108 or 156A; Music 144, either 143 or 145, 146A, and two units selected from courses numbered 170 through 188; Drama $110,120,122,127 \mathrm{~A}, 132,140 \mathrm{~A}, 142$ (maximum 3 units), $152 \mathrm{~A}, 160 \mathrm{~A}$. At least 15 additional units as specified in one of the following areas: Philosophy 101, 103, 123, 127, either 128 or 135 ; English 175 or 180, six units selected from 103, 121A, 121B, or from courses numbered 111 through 118, six units selected from courses num-

## Fine Arts and Social Sciences, for Elementary Teaching

Preparation for the major. Courses must be selected from the same two areas as those to be used for the upper division concentrations: Art 1A, 2A; Drama 8, Speech Communication 3 ; or Music $2,10 \mathrm{~A}, 10 \mathrm{~B}, 10 \mathrm{C}$; plus six units in one of the ogy, or sociology.
Teaching Major. A minimum of 24 upper division units to include nine units
selected from Art $110,118,117 \mathrm{~A}$ or $119 \mathrm{~A}, 108$ or 156 A ; Music 144 , selected from Art 110, 118, 117A or 119A, 108 or 156A; Music 144, either 143 or 145, 146A, and two units selected from courses numbered 170 through 188; or nine units selected from Drama $110,120,122,127 \mathrm{~A}, 132,140 \mathrm{~A}, 142$ (maximum 3 owing areas: 160 A . At least fifteen additional units as specified in one of the fol
Anthropology 100A, 100B, 102, 103, 120, 151, 152, 156, 163, and 165.
Economics 100A, 100B, 102, 103A, 103B, 110, 111, 131, 135, 150, 170, 195, and 196.
Geography. Six to nine units selected from Geography 120, 121, 122, 123, 124 , $101,105,110,150,151,152,153,155,180,181 \mathrm{~A}, 181 \mathrm{~B}$, and 182 . Geography 100 ,

Interdepartmental Minor: Humanities
The requirements for the departmental minors are described with each department in the catalog section Courses and Curricula. The requirements for the interdepart-
mental minor in humanities, with a concentration in are as follows: 15 units in Latin, six of which in Latin, for secondary teaching eight units must be taken in these courses: Comparative Literatision. Another ure $102 \mathrm{~A}-102 \mathrm{~B}$, courses, or any combination of these.

## Specialized Preparation Applicable to the <br> Standard Teaching Credential

Those who plan to teach in the secondary schools may use the following
pecializations in place of a minor: Exepril curdre of a minor:
xceptional Children: Deaf or Severly Hard of Hearing
Required: Education 167, 179, and 185; Education 172 or Speech Pathology and 153, 156, 255, and 257.

## Exceptional Children: Handicapped in Speech or Hearing (Plan I)

Required: Education 167 and 184; Speech Parhearing (Plan 1) $123,124,126,127,128,140,141,145,151$, and 244.
Exceptional Children: Mentally Retarded
Required: Education 167, 168 or 169
five units chosen with approval of the adviser ( 26 units). 182 , Psychology 109, and School Librarian
Required: Education 183, Library Science 110, 118, 119, 136, 138, 184, 231, 232 and two courses selected from Library Science 225, 226,227
Persons wishing to teach or serve in these specialized areas at the elementary
level must also take the indicated courses.

## Other Credentials

San Diego State also accepts candidates for the standard teaching credential master's or doctor's degree. For details, consult. Such a candidate must have a College Programs.
The university
Credential with specialization in bealth or in pupil personnel servignated Services
requires registration as an R.N, in California former nursing issued by the California State Board of a valid certificate of public health a master's degree. For details, see the Coordin Public Health. The latter requires Coordinator of Counselor Education, respectively. of Secondary Education or the
Similarly, applicants for the Standard Supervisi
degree. For details, see the Coordinator of Edision Credential must have a master's
A restricted credential as a speech and hearing
at all grade levels. For details, see Speech Pathology and Audiology.

## Minor in Library Science

The minor consists of 15 units in library science
A. Review of Arithmetic (0) I, II
H. Review of Handwriting (0) I, II
R. Review of Reading (0) I, II
5. Review of Spelling (0) I, II

Noncredit courses designed to increase competence in the skill subjects required of all applicants to elementary teacher education.
100. The Secondary School (4) I, II

Prerequisite: To be taken concurrently with Education 180B.
American Education in its social and historical setting. The secondary school curriculum, the philosophies, issues, and social forces that influence the school. Not open to students with credit in Education 101 or 102.
101. History and Philosophy of Education (2) I, II, s

Prerequisites: Senior standing and a minimum of 12 units in education.
Historical backgrounds and underlying philosophies upon which the public school system has been established. Meaning of education, educational aims and values, and democracy and education. Not open to students with credit in Education 100.

## 102. Secondary Education (3) Irregular

An introduction to understanding the development of secondary education and its present status as a social institution. Not open to students with credit in Education 100.
104. European Education and Cultural Change (3) II

Tradition and change in contemporary European education with special reference to England, France, Germany, and the U.S.S.R.

## Psychological Foundations

110. Psychological Foundations of Education for Secondary Teachers (5) I, II

Five lectures and instructional media laboratory.
Prerequisites: Admission to Teacher Education and education program approved the Coordinator of Secondary Education. To be taken concurrently with Eduation 180 A ind instrional media demonstration and practice
The nature of growth and development, principles and theories of learning, guidance practices, test and measurements. Not open to students with credit in Education 112 or 113.
111. The Learner in the Elementary School (3) I, II, Summer

Prerequisites: Psychology 1 and admission to Elementary Education
Intellectual, emotional, social, and physical development during childhood and early adolescence, including basic principles of child guidance and counseling. Diected observation required.

## 112. The Learning Process in the Elementary School (3) I, II, Summer

Prerequisite: Education 111
Psychological principles for effective classroom teaching; techniques of measurement and evaluation for the diagnosis and improvement of learning.
113. Growth and Development of the Adolescent (3) Irregular

Adolescent physiological, psychological, social, and emotional development, including principles of mental hygiene and guidance. Field work with adolescent groups in the community is required. Not open to students with credit in Education 110 .
114. Interpretation of Early Childhood Behavior (3) Irregular in Summer

For kindergarten-primary teachers treating the analysis and interpretation of early childhood behavior. Emphasis on understanding and interpreting the causative factors in typical behavior of children to parents, social workers, teachers, and
115. Guidance in Elementary Education (3) I, II, Irregular

A study of the basic principles of guidance and their function in the educational process as applied in the elementary school.

116A-116B-116C. Child Study Laborafory I, II
Prerequisite: 116 A is prerequisite to 116 B , and 116 B to 116 C
Development of background and procedures for child study and their application to field situations. Field work required. For teachers in service. Offered only in
Extension.
18. Supervision of Child Welfare and Attendance (3) Irregular

Content includes laws relating to children, guidance principles, social casework supervision, attendance work, child accoun , mome visitation methods, employment

## Methods-Secondary

20. The Teaching Process (3) I, in

To develop teacher competency at the secondary level in professional and com and in evaluating learning activities.
121. Methods and Materials of Instruction: Major (2) Minor (2) except Education 121E (3) and Education 121Q (3)
Lecture courses, except that Education 121 K and 121 N meet for one lectur and three hours of laboratory
Professional courses in specific teaching fields taken concurrently with directed to each subject area named. Subject fields for section 121 are as follows:

## Offered in the Fall Semester

A. Methods in Art
B. Methods in English.
C. Methods in Home Economics
D. Methods in Industrial Arts
E. Methods in Foreign Languages
F. Methods in Foreign Lang
F. Methods in Mathematics
K. Methods in Physical Science
L. Methods in Speech Communication
M. Methods in Social Science
N. Methods in Life Science
O. Methods in Drama
Q. Methods in Business Skills
V. Methods in General Science

Offered in the Spring Semester
C. Methods in Home Economic
D. Methods in Industrial Arts
F. Methods in Mathematics
K. Methods in Physical Science
M. Methods in Social Science
N. Methods in Life Science
V. Methods in General Science

## Offered Irregularly

P. Methods in Health Education
H. Methods in Phys. Ed. (Men)
J. Methods in Phys. Ed. (Women)
. Methods in Choral Music
S. Methods in Instrumental Music
22. Reading in Secondary Education (3) Irregular

The nature of the reading program, development of techniques and skills, vocabument, diagnosis, and remediation.
123. Organization and Operation of the Reading Laboratory (3) I, II

Lectures and laboratory to eight hours per week.
Prerequisite: Education 122.
Problems and techniques in organizing and operating the reading laboratory in cond current research and laboratory experiences.

## 126. Workshop in Secondary Education (3 or 6) Irregular

Designed to meet the needs of individuals or groups of teachers who wish to develop or continue the study of some problem with the consultation of the college
staff and the San Diego County Curriculum Staff.

Methods-Elementary
130. First Elementary Education Practicum (2) I II, (3) 5

Four hours of activity for 130 A ; four hours of activity for 130 B ; six or more Four hours of activity for 130A; four hours of activity for
Prerequisite Concurrent ristrion in Education 111, or consen of Coordiator of Elementary Education.
Curriculum, principles, methods, and materials of instruction (including audiovisual), and participation in elementary education, in the areas listed A through C below.
A. Arithmetic
B. Language Arts
C. Student Teaching (Not offered in the summer
131. Second Elementary Education Practicum (2) I, II, S, except 131D (3) or 131E (4) Four hours of activity for 131A; four hours of activity for 131B; six or more hours of activity for 131 C or 131 D or 131 E ; and instructional media laboratory. Prerequisite: Education 111 and 130; concurrent registration in Education 112 or consent of Coordinator of Elementary Education.
Curriculum, principles, methods, and materials of instruction, including instructional media, and participation in elementary education, in the areas listed in A through E below.
A. Reading
C, D, or E. Student Teaching (not
B. Social Studies
offered in the summer)
132. Third Elementary Education Practicum (2) I, II, S, except 132D (4) or 132E (5) Four hours of activity for 132A, for 132B, and for 132C; ten or more hours of activity for 132 D or 132 E .
Prerequisites: Education 112 and 131.
Curriculum, principles, methods, and materials of instruction, including instructional media, and participation in elementary education, in the areas listed in A through E below.
A. Science
D or E. Student Teaching (not
B. Art offered in the summer)
C. Music
133. Children's Literature in Elementary Education (3) Irregular

A survey of children's literature; the selection and use of material in the elementary classroom.
134. Laboratory in Elementary Education (3) s

A general course in observation and theory, including a study of arithmetic, reading, language, music, science, social studies, art, spelling. Students in this course will observe in the summer demonstration school and discuss with the staff the teaching procedures.

## 135. Workshop in Elementary Education (3 or 6) Irregular

To meet the needs of individual or groups of teachers who desire to study selected problems in elementary education. The observation of classroom teaching will be provided for members in attendance, Interested persons should corr
136. Modern Foreign Languages in Elementary Education (3) Irregular

Prerequisites: French or German or Spanish: (1964-65) courses 1, 2, 10, 11, or equivalents, 11 , or equivalents.
1, Methods of teaching modern foreign languages in the elementary school, emphasizing the audio lingual approach. Students will produce materials and learn to use tapes, film strips, records, films, language laboratories, and written materials.
137. Reading Difficulties (3) 1,5

Two lectures and two hours of laboratory.
Prerequisites: Education 112 and 131 A or 122.
in reading difficulties, their causes, prevention, and correction. Remedial practices 138A. Curriculum ind speading specialist.

## 138A. Curriculum in Elemen Formerly Education 138 .

Emphasis upon the selection and development of content, teaching methods principles, and the nature of the learner.

138B. Social Studies Unit Construction in Elementary Education (3) Irregular
Prerequisite: Education 131B.
Selecting and organizing content, analyzing materials, and developing instruc

## 39. Kindergarten-Primary Practicum (3) I, II,

The theory of early childhood education, 5
cation 132 C whe kindergarten. This course must be materials and teaching techcation 132C when the student teaching assignment is taken concurrently with Edu-

## Audiovisual

140. Techniques of Media Utilization (3) $\mathbf{I}, \mathrm{II}, \mathrm{s}$

Three lectures and two hours of laboratory.
Use in the teaching-learning process, including laboratory.
141. Producing Instructional Materials (3) Irregular Prerequisite: Education 140.
Production and evaluation of instructional materials

## (Same course is Educational Television (6) $s$

Open
The procedures and theories of teled in instruction by television.
circuit and instructional use of television. Th production as it pertains to closed e discussed the method of presenting material through the discussed and demonstrated.
144. Application of Programed Instruction (3) Irregular

Prerequisite: Education 112 or 110, or Psychology 175
Application of programed instructional
punch and strip devices, programed texts, teaching to the teaching process, i.e., systems. Individual and programs; laboratory instructiona
15. Measurement and Evaluation in

Should follow Education 112 for Elementary Education (3) I, II, $\mathbf{s}$
The use of intelligence and achievement
of learning; construction of objective examination the diagnosis and improvement
ements of statistical techniques.
Problems of evaluation in in Secondary Education (3) Irregular elements of statistics, selection and interpretation, construction of examinations, open to students with credit in Education 120. .

## 153. Quantitative Methods in Educational Research (3) I, II

Basic tests of statistical significance with special reference to the interpretation
educational data.

## Exceptional Cbildren

161. Measurement and Evaluation in Special Education (4) II

Three lectures and 3 hours of laboratory.
Prerequisites: Education 120; 151 or 152; and Psychology 105.
Consideration of representative tests and evaluation procedures appropriate to the several areas of exceptionality; problems in psycho-educational diagnosis and appraisal; assembling and utilizing test results for the educational and/or rehabilitation program.
162. Emotionally Disturbed Children and Youth (3) 1,5

Prerequisite: Education 167.
Nature, needs and problems of emotional deviates; survey of settings and roles of those who help, and ways they help
163. Curriculum and Methods for Teaching Emotionally Disturbed Children and Youth (3) II or Irregular
Prerequisites: Education 162 or 167.
Selection, organization and presentation of curricular materials for emotionally disturbed children and youth.
164. Education of the Neurologically Handicapped (3) I

Prerequisites: Education 167 and Psychology 109.
Educational and psychological problems of brain-injured children and youth; identification procedures; educational programs, instructional methods, preparation of materials.
167. Exceptional Children (3) I, II, 5

Characteristics and adjustment problems of mental, physical, and emotional deviates.
168. Curriculum and Methods for Teaching Mentally Retarded Children in the Elementary School (3) II, 5
Prerequisite: Psychology 109 or Education 167.
Selection, organization, and presentation of curricular materials for mentally retarded children at all levels of the public schools. Concentration will be on the elementary level. (Recommended for students with specialization in Elemeritary Teaching.)
169. Curriculum and Methods for Teaching Mentally Retarded Children in the Secondary School (3) 1, 5
Prerequisite: Psychology 109 or Education 167.
Selection, organization, and presentation of curricular materials for mentally retarded children at all levels of the public schools. Concentration will be on the secondary level. (Recommended for students with specialization in Secondary Teaching.)

## 170. Workshop in Special Education (2-4) I, II, $\mathbf{s}$

Curriculum and methods of teaching in an area of exceptionality; observation of demonstration class; development of materials of instruction. May be repeated once in a second area of exceptionality. Not more than six units may be used for any degree.
171. Practicum in Mental Refardation (2) II

One lecture and two hours of laboratory.
Prerequisites: Admission to Special Education, and Psychology 109 or concurrent registration.

Supervised observation and participation in classroom and related school activities for mentally retarded. Course work includes discussion, analysis, and report of observations.
172. Counseling Exceptional Children (3) I, S

Prerequisites: Education 110 or 112, and Education 167 or Psychology 109
Educational, mental, social, and vocational counseling of exceptional individuals
173. Education of the Severely Mentally Retarded (3) II, s

Prerequisites: Education 167 and Psychology 109, and admission to Special Edu-
cation. cation
Organization and planning of instructional activities; materials and equipment. under 50 IQ and those with neurological impairments. under 50 IQ and those with neurological impairments.
174. Principles and Methods of Speech Correction (3) I (Same course as Speech Pathology and Audiology 124
Prerequisites: Speech Pathology and Audiology 120 and 121.
Etiology and treatment of the more common speech disorders, including physiol ogy of speech, voice disorders, cleft palate, foreign dialect.
176. Stuftering and Neurological Disorders (3) I
(Same course as Speech Pathology and Audiology 125)
Prerequisites: Speech Pathology and Audiology 120 and 121.
Clinical survey of newest methods of speech correction. Special emphasis given to causes and treatment of stuttering, cerebral palsy speech problems and aphasi in adults and children. Study of child or adult who presents multiple problems.
177. Audiometry: Principles (3)
(Same course as Speech Pathology and Audiology 140)
Prerequisite: Psychology 50.
Anatomy and physiology of the human ear, theories of hearing, physics of sound, medical aspects, pathology and surgery of the ear, survey of current audio-
metric techniques.

178A. Communication Skills for the Deaf (3)
(Same course as Speech Pathology and Audiology 151)
Prerequisite: Speech Pathology and Audiology 140.
History, theory and methods of lipreading; auditory training.
179. Curriculum and Instruction for Teaching the Deaf (3) II

Prerequisite: concurrent registration in Education 185.
General elementary curriculum principles, methods and materials of instruction in observation in programs for the deaf children including reading. Twenty-six hours

## Student Teaching

180A-180B. Directed Participation, Secondary (1-1) I, II
Prerequisite: To be taken concurrently with Education 100 and Education 110 . and participation in the classroom.

## 180C-180D. Directed Teaching Secondary (3-3) I, II

Prerequisites: Admission to teacher education and concurrent registration in EduSystematic observation 180 C is prerequisite to 180D. or senior high school. A weekly seminar teaching under supervision in a junior 180D is also offered in the summer.
201. The Community College (2)
202. Social Foundation (2 or 3)
204. Comparative Education (3)
205. History of Education (3)
206. Philosophy of Education (3)
207. Educafional Sociology (3)
208. Workshop in Community Influences on Learning and Curriculum Planning
(3 or 6 )
209. Workshop in Community College Education (2-6)

Procedures of Investigation
211. Procedures of Investigation and Report (3)
212. Educational Research Design (3)
213. Advanced Quantitative Methods in Educational Research (3)

## Educational Psychology

220. Advanced Educational Psychology (3)
221. Seminar in Educational Measurement (3) S
222. The Gifted Child (3)
223. Educational Psychology: Community College (2)

## Guidance

224. Administration of Pupil Personnel Services (3)

225A-225B. Deferminants of Human Behavior (3-3)
226. Guidance Services in Public Education (3)
229. Workshop in Counseling (3)
230. Guidance Problems in Secondary Education (3)
231. Theory and Process of Appraisal (4)
232. Theory and Process of Vocational Choice (4)
233. Theory and Process of Counseling (4)
234. Theory and Process of Group Counseling (4)
237. Appraisal and Vocational Choice (6)
238. Counseling: Individual and Group (6)

239A-239B. Professional Seminar in Guidance (3-3)

## Elementary Education

240. Curriculum Construction and Evaluation in Elementary Education (3)
241. Seminar in Arithmetic in Elementary Education (3)
242. Seminar in Reading in Elementary Education (3)

243A. Seminar in Social Studies in Elementary Education (3)

243B. Seminar in Elementary Social Studies Curriculum Development (3)
244. Seminar in Language Arts in Elementary Education (3)
245. Seminar in Elementary Education (3)
246. Advanced Diagnosis in Reading (3)
247. Advanced Diagnosis and Treatment of Learning Difficulties (3)
248. Seminar in Science in Elementary Education (3)

249A. Seminar in Art in Elementary Education (3)
2498. Seminar in Music in Elementary Education (3)

## Secondary Education

250. Curricular Problems in Secondary Education (3)
251. Instructional Methods and Materials: Community College (2)
252. Seminar for Student Teachers (3)
253. Supervision of Student Teaching (2)
254. Advanced Problems in Secondary School Instruction (3)

255A. Advanced Curriculum and Instruction in Mathematics (3)
255B. Advanced Curriculum and Instruction in Social Science (3)
255C. Advanced Curriculum and Instruction in English Language and Composition (3)
255D. Advanced Curriculum and Instruction in Literature (3)
256. Recent Trends in Secondary Curriculum (3)
257. Workshop in Intercultural Education (4)
258. Research in Curricular Problems (1-3)

## School Administration and Supervision

260. Principles of School Administration (3)
261. Education Leadership (3)
262. Legal and Financial Aspects of School District Policies (3)
263. Curriculum Development and Evaluation (3)

264A-264B-264C. Seminar in Elementary School Administration and Supervision (2-2-2)
265A-265B-265C. Seminar in Secondary School Administration and Supervision (2-2-2)
266A-266B-266C. Field Experience in Elementary School Administration and Supervision (1-1-1)
267A-267B-267C. Field Experience in Secondary School Administration and Supervision (1-1-1)
268. Seminar in School Administration and Supervision (3)
270. Seminar in Education of Exceptional Children (3)
271. Seminar in Emotionally Disturbed Children and Youth (3)
272. Seminar in Education of the Gifted (3)
273. Seminar in Education of the Mentally Retarded (3)

274A. Seminar in Instructional Media Utilization (3)
275. Seminar in the Administration of Instructional Media Centers (3)
276. Seminar in Programed Instruction ( $\mathbf{3}$ to 6)
280. Legal and Financial Aspects of School District Management (3)
281. School-Community Relationships (3)
282. School District Personnel Management (3)
283. District Curriculum Development, Evaluation and Improvement (3)
284. Advanced Seminar in School Administration and Supervision (3)

286A-286B. Seminar in School Building Construction and Utilization (3-3)
Special Study and Research
295A-295B. Seminar (3-3)
298. Special Study (1-3)
299. Thesis (3)

Student Teaching and Internship
316. Directed Teaching: Community College (4)
330. Internship (2-6)
331. Field Work in Counseling (2-6)
332. Practicum in Counseling (3)
333. Advanced Seminar and Practicum in Counseling (3-6)
360. Internship in School Administration and Supervision (3 to 6)
371. Directed Internship-Mentally Retarded (4)
374. Directed Internship-Speech Correction (4)
375. Directed Internship for the Instructional Media Specialist (2-6)

## Library Science

1. Use of the Library (1) I, II

Introduction to use of the library. Includes classification, card catalog, periodical indexes, selected reference books, and preparation of bibliographies.
110. Bibliography and Reference Materials (3) I, II

Prerequisite: Library Science 1.
A comprehensive course dealing with reference books, bibliographies, and source materials, with emphasis upon their use in research. A course of general interest and utility.
118. Selection and Acquisition of Library Materials (3) I

Study of all types of book and nonbook materials, including sources of information, selection, and evaluation. Attention is given to book and film reviews, standard tion, selection, and evaluation. Attention is given to book and film reviews, standard
lists, trade publications and bibliographies, publishers' and producers' announcements.
119. Technical Processes (3) I

Theory and methods of organizing library materials; a study of classification, cataloging, and choice of subject headings.
136. School Library Administration (3) I

Objectives, standards, and activities involved in operating the school materials program. Planning, organizing, administering, and coordinating the school library wrogram. Planning, organizing, admenistering,
138. Organizing and Processing of Curriculum and Special Materials (3) II

Prerequisite: Library Science 119.
Methods of purchasing, processing, classifying, cataloging and servicing special curriculum and audio-visual materials.
184. History of Books and Libraries (3) II

The historical development of the book and of the library from the earliest times to the present day; examines their influence upon our schools and culture. Open to ll upper division students.
191. Workshop in Library Science (1-3)

Prerequisite: 12 units of library science or employment as a school librarian
Designed to meet the needs of school librarians and others who wish to develop or continue the study of selected library problems. Maximum credit six units.
225. Bibliography of the Humanities (2)
226. Bibliography of the Social Sciences (2)
227. Bibliography of the Sciences (2)
231. Literature for Children (3)
232. Literature for Adolescents (3)

## School of Engineering

## Martin P. Capp, Dean; Frederick T. Quiett, Associate Dean

## Accreditation

The undergraduate curriculum in Engineering, with options in aerospace, civil, electrical and electronic, and mechanical engineering, is accredited by the Engineers' Council for Professional Development.

## Undergraduate Program

The objective of the engineering program at San Diego State is to provide the intellectual and physical environment best calculated to encourage student to develop their capacities toward a successful career in the profession of engineering. The graduate of this program is able to assume personal responsibility for the development and application of engineerilg knowe the benefit of mankind. He is qualified to take the Engineer-in-Training examination as a first step to professional registration, to enter industry at the junior engineer level, or to continue his formal education at the graduate level. Because the engineer's work is predominantly intellectual and varied, and not of a routine mental or physical character, this program places emphasis upon the mastery of a strong core of subject matter in the physical sciences, mathematics, and the engineering sciences of broad applicability. Woven throughout the pattern is a con tinuing study of the socio-humanistic facets of our civilization, because the engi neering graduate must expect to find his best expression as a leader of men, conscious of the social and economic implications of his decisions
Although the profession of engineering presents in practice a variety of specialties, the undergraduate student confines his attention during the first two years of the four-year program to a common pattern of course work in fundamentals. During his junior and senior years he may give outlet to his interest in a broad field of engineering by electing a total of en enical engineering. Even here, during this upper division work, the student is involved with his fellows in the study of a common core of the engineering sciences; these courses, together with those elected in a specialty field, are taught with an emphasis upon universal application and crossfertilization of thought.

## Faculty

Emeritus: Walling
Professors: Bauer, Bedore, Capp, Conly, Dharmarajan, Fitz, Johnson, Pi, Learned, Lodge, Morgan, C., Noorany, Quiett, Rao, Shutts, Stone, S.
Associate Professors: Chan, Chang, Craig, G., Eggleston, Krishnamoorthy, Leon-
hardt, Lin, Mann, McGhie, Murphy, R., Ohnysty, Skaar, Stone, H., Stratton
Assistant Professors: Agarwal, Bearnson, Bilterman, Brown, W., Caton, Chou, Crooker, Harris, F., Hussain, Mansfield, McElmury, Narang, Panos, Stuart

## Offered by the School

Master of Science in aerospace, civil, electrical, and mechanical engineering.
Bachelor of Science in engineering, with options in aerospace, civil, electrical and electronic, and mechanical engineering
Minor in engineering.

## Major in Engineering

The major consists of 53 upper division units in a prescribed pattern. The program of study for the first two years is the same for all students in the School; thereafter there is differentiation according to the student's selected field of spe-
cialization. The requirements are as follows:


Upper Division Requirements
The program of study for the last two years embraces the fundamental engineering sciences and their application to specific problems in selected fields of engi neering practice, together with an opportunity for the student to approach an intellectual maturity in social, economic, ethic, and aesthetic thought.
The student must complete (1) the upper division requirements for all students (2) the requirements of the selected field of specialization in accordance with an pproved master plan filed during the first semester of the junior year; and (3) the emaining units of general education
Recommended patterns in the four fields of specialization are shown below

## Aerospace Engineering

All students in the Aerospace Engineering option pursue a common program of aerospace engineering fundamentals; however, some elective opportunity is provided through a choice of upper division courses in engineering, mathematics, or physics, subject to approval of the apper division aerospace engineering courses follows:

| Junior Year |  |  |  |
| :---: | :---: | :---: | :---: |
| Fall semester | Units | Spring semester | Units |
| E115 Fluid Mech. | 3 | E150B, Aerodynamics |  |
| E115L, Fluid Lab |  | E151A, Aero. Struct. Anal. I |  |
| E116, Int. to Solid Mechanics | - 3 | E187B, Methods of Analysis |  |
| E116L, Solid Mechanics Lab. | $\begin{array}{r}1 \\ -1 \\ \hline\end{array}$ |  |  |
| E150A, Aerodynamics | - 3 | $\dagger$ Electives within major |  |
| E187A, Methods of Analysis |  | Political Science 117 or 118 . |  |
| History Political Science 115 | 3 ( 3 Pata |  |  |
| 17 |  |  |  |
|  | Senior Year |  |  |
|  |  |  |  |  |  |
| Fall semester | Units | Spring semester | its |
| E151B, Aero. Struct. Anal. II | - 3 | E190G or E190H, Engr. Appl. |  |
| E153, Flight Mech. | 3 | E152, Propulsion Systems |  |
| +Electives within major | - 7 | $\pm$ Electives within major | - 6 |
| -*Social Sciences or Humanities | S | -*Social Sciences or Humanities |  |

** Recommended general education course. by the department chairman.
$\dagger$ Approved as $p$

## Civil Engineering

All students in the Civil Engineering option pursue a common program of civil ngineering fundamentals; however, some elective opportunity is provided through choice of upper division engineering courses, subject to approval of the advise nd the department chairma. The recommended pattern for upper division Civil Engineering courses follows:

| Fall semester U | Units | Spring semester | Units |
| :---: | :---: | :---: | :---: |
| Engr. 116, Introd. to Solid |  | Engr. 115, Fluid Mechanics | 3 |
| Mechanics | 3 | Engr. 115L, Fluid Mech. Lab | 1 |
| Engr. 116L, Solid Mechanics Lab | 1 | Engr. 120A, Struc. Anal. I | 4 |
| Engr. 187A, Methods of Analysis | 3 | Engr. 128A, Surveying | 3 |
| Engr. 108, Thermodynamics, or Engr. 118, Rate Processes. | 3 | Engr. 100, Elec. Energy Conv., or Engr. 187B, Methods of |  |
| Engr. 108L (needed for 108) | 1 | Analysis | 3 |
| General Education | 6 | Geol. 53, Gen. Geol. for Engrs. | . 1 |
| 16 or |  |  | 15 |
|  | Senior | Year |  |
| Engr. 122, Soil Mech. | 3 |  |  |
| Engr. 123, Appl. Hydraul. | 3 |  |  |
| Engr. 127, Highway Engr. | 3 | Engr. 121, Reinf. Concrete |  |
| $\dagger$ Electives within major | 5 | $\dagger$ Electives within major _-10 or |  |
| General Education | 3 | General Education ... |  |
|  | 17 | 16 or |  |

## Electrical and Electronic Engineering

All students with the option in Electrical-Electronic Engineering include in their program a sequence of courses designed to develop an understanding of the basic principles, laws, and methodology of Electrical-Electronic Engineering. The student, through the proper selection of electives, has the opportunity to develop proficiency in his area of special interest. Typical areas include communications, ecmmended pattern of courses for upper division electrical-electronic engineerin majors is tabulated below.


The "electives within major" for each of the areas of special interest will in clude the following courses:

|  | 6th Sem. | 7th Sem. | 8th Sem. |
| :--- | :---: | :---: | :--- |
| Communications | 102 | 133,134, | 135,139, |
|  | $134 \mathrm{~L}, 137$ |  |  |
| 139L, 191 |  |  |  |
| Control Systems | 167 | $102,113 \mathrm{~L}$, | $169,169 \mathrm{~L}$ |
|  |  | 168 |  |
| Digital Engineering | 176 | 102,174 | 175,177, |
|  |  |  | 177 L, |
| Electronics | 102 | $134,134 \mathrm{~L}$, | 135,162, |
|  |  | 174 | 164,175 |

## MECHANICAL ENGINEERING

All students with the option in Mechanical Engineering follow a common All of mechanical engineering fundamentals. Opportunity to pursue area program of mechanical engineering choice of technical electives. This opportunity is afforded in the general areas of design and energy conversion. The recommended pattern for required upper division courses in mechanical engineering is as follows:


## Minor

The minor in engineering, intended for students in other academic areas of the iversity, consists of 15 units in engineering, nine of which must be upper divi . The courses must be approved by the dean of the School of Engineering.
A. Introduction to Engineering (1) A survey of the fields, the responsibilities, and the opportunities of the profession.

## Engineering Drawing (2) 1, II

Six hours of laboratory.
Dix and techniques of drawing for engineers. Elementary ortho-
Development of sial drawing theory. Introduction to basic theorems of descripive geometry. Theories of size description.
2. Plane Surveying (3)

One lecture and six hours of laboratory.
Prerequisite: Mathematics 21 or 40.
Use, care, and adjustment of surveying equipment. Introduction to standard procedures, techniques of plane surveying, and plane table mapping.
10. Control of Man's Environment (3) I, II
10. Control of Man's Environment (3) I, II
Man's interaction with the land, water and air environment; environmental polluMan's interaction with the land, water and air environm
tion; role of engineering in controlling man's eviroment.

## 20. Engineering Graphics (2) I, II

## Six hours of laboratory.

Prerequisites: Credit or concurrent registration in Mathematics 40 or equivalent, Prerequisites: Credit or concurrent registration in Mathematics 1 or ongineering Graphics Placement Examination.
Graphic communication for engineers. Presentation and interpretation of engi-
Graphic communication for enginers. Plans, using both standard projection systems and freehand sketching. Introduction to nomography; graphic presentation and analysis of data.

## 25. Engineering Materials (3) I, II

Prerequisite: Chemistry 1A.
Atomic and molecular structure of materials utilized in engineering. Analysis of the relationships between structure of materials and their mechanical, thermal, electrical, corrosion and radiation properties, together with examples of specific application to engineering problems.

## 30. Engineering Masuratics 51 and Physics 4A

Introduction to basic standards and units of engineering measurement. Analysis Introduction to basic standards and units of errors in measurement and error propagation in calculation. Treatment of exof errors in measurement and error propagation in eallaly detarmined quantities. Design of engineering experiments.
40. Engineering Problem Analysis I (2) 1,11

One lecture and three hours of laboratory.
Prerequisite: Mathematics 50.
Analysis of engineering problems and solutions using the digital computer. Fundamentals of programing and programing language commands.

## 50A. Engineering Mechanics I(3) I, II

Prerequisites: Physics 4A and credit or concurrent registration in Mathematics 51.
Static equilibrium of particles and rigid bodies; vector algebra and calculus; friction, virtual work; kinematics of a particle; kinetics of a particle; engineering applications.

## 508. Engineering Mechanics II (3) I, II

Prerequisites: Engineering 50A and credit or concurrent registration in Mathematics 52 .
Kinetics of a particle; central force motion; systems of particles; work and energy: impulse and momentum; moments and products of inertia; Euler's equations of motion; vibration and time response; engineering applications.

## 60. Electric Circuits (3) I, II

Prerequisites: Physics 4B and Mathematics 51.
Direct-current circuits, magnetic circuits, induced voltages, single-phase alternat-ing-current circuits, coupled circuits, the transformer and introduction to network analysis. Not open to students with credit in Engineering 100A.

## 100. Electrical Energy Conversion (3) I, II

Prerequisite: Engineering 60.
Magnetic circuits, transformers and polyphase AC networks. Fundamentals of electromechanical energy conversion; induction motors, synchronous machines and DC machines. Formerly Engineering 100B, Electrical Machinery

100L. Electrical Energy Conversion Laboratory (1) I, II
Three hours of laboratory.
Prerequisite: credit or concurrent registration in Engineering 100.
Experimental study of DC, single and polyphase AC circuits, transformers, and machines. Formerly offered as an integral part of Engineering 100B.

## 101. Fundamentals of Engineering Electronics (3) I, II

Prerequisite: Engineering 60.
Application of diodes, transistors, electron tubes, and thyristors, in typical elecApic ciruits Analysis and design of rectifiers and filters, and elementary amplifiers. Emphasis on their utilization in engineering equipment and systems.

101L. Engineering Electronics Laboratory (1) I, II
Three hours of laboratory.
Prerequisite: credit or concurrent registration in Engineering 101
Experimental study of laboratory instruments, diodes, rectifier circuits, filters, silicon controlled rectifiers, tubes, transistors, and amplifiers.

## 102. Electric and Magnetic Fields (3) I, II

Formerly Engineering 100C.
Prerequisites: Engineering 50B and 60 .
Flectrostatic and magnetostatic field theory using vector notation; Coulomb's Law, Gauss' Law and potential theory. Solutions to Poisson's and Laplace's equaLaw, Gauss Law and inductance. Time-varying electric and magnetic fields; Maxwell's equations.
103. Electronics, Instrumentation, and Electrical Energy Conversion (3) I, II

Prerequisite: Engineering 60 .
Theqry and application of electron tubes, diodes, and transistors in typical elecTheory and application of ele electronic measuring devices. Fundamentals of tronic circuits. instrumgy conversion including motors and transformers.

## 103L. Electrical Engineering Laboratory (1) i, in

Formerly Engineering 103.
Three hours of laboratory
Pree wisite: credit or concurrent registration in Engineering 103.
Prerequise. experiments in electrical circuits, elec A laboratory course machinery.

Three lectures and three hours of laboratory.
Prerequisites: Engineering 25 and Physics 4C.
Prerequi metallurgy and properties of metals. Influence of processing on the
Physical metallurgy and properties for selection of materials. (Formerly numproperties Engineering 106 and 109A.)
08. Thermodynamics (3) I, II

Prerequisite: Mathematics 52 . Development of the basic laws of their application to engineering systems.
microscopic viewpoints and their applic
108L. Thermal Science Laborat
Three hours of laboratory.
Prerequisite: Credit or consic concepts of thermal science. (Formerly offered Laboratory studies of the basic concer
109. Nonmetallic Materials (3) I

Two lectures and three hours of laboratory.
Prerequisite: Engineering 107.
Fundamentals of plastics, reinforced plastics, and ceramics. Analysis of effect of physical properties upon selection of a material for use in design.

Prerequisite: Mathematics 52.
First and second laws of thermodynamics; materials, heat conduction, convection, Find ret acceptable for mechanical engineering majors.
111. Network Analysis (3) I, II

Formerly Engineering 130.
Prerequisites: Engineering 60 and Mathematics 52.
Loop and modal analysis using General Network Equations; network theorems; frequency and time response using poles and seros. Two-port parameters.
112. Advanced Network Analysis (3) I, II

Formerly Engineering 132, Time-Domain Analysis of Linear Networks.
Prerequisites: Engineering 111, and 187A or Mathematics 118A.
Transient analysis of circuits containing resistance, inductance, and capacitance with various input wave forms by means of the Laplace-transform method.

## 113L. Analog Computation of Electrical Engineering Problems (1)

Three hours of laboratory.
Prerequisites: Engineering 101, 187A, and credit or concurrent registration in Engineering 112.
Use of the analog computer in the solution of typical electrical engineering problems.

## 114. Analysis and Design of Electronic Circuits (3) I,

Formerly Engineering 134A.
Prerequisites: Engineering 101, 111, and 187A or Mathematics 118A.
A unified treatment of vacuum-tube and transistor voltage and power amplifiers Ailizing graphical methods and equivalent circuits; feedback theory and tuned utilizing
amplifiers.
114L. Electronic Circuits Laboratory (1) I, II
Formerly Engineering 135A.
Three hours of laboratory.
Prerequisite: Credit or concurrent registration in Engineering 114.
Vacuum-tube and transistor dynamic characteristics; single stage and multistage mplifier circuits including feedback and tuned amplifiers.
115. Fluid Mechanics (3) I, II

Prerequisites: Engineering 50B, and credit or concurrent registration in Engineering 187A.
Fluid statics. Laminar and turbulent flow of liquids and gases in pipes, nozzles, Fimensional analysis and modeling. Drag forces on moving or immersed objects.

## 115L. Fluid Mechanics Laboratory (1) I, II

## Three hours of laboratory.

Prerequisite: Credit or concurrent registration in Engineering 115.
Flow measuring devices. Experimental applications of continuity, Bernoulli and Fowtum equations. Model studies. Pipe and channel flows. Flow visualization momentum equations. Model stacteristics of wind tunnel and water table.

## Engineering

116. Introduction to Solid Mechanics (3) I, II

Prerequisites: Engineering 25 and 50 B ; and credit or concurrent registration in Engineering 187A
Mechanics of solid deformable bodies involving analytical methods for determining strength, stiffness, and stability of load-carrying members.

## 116L. Solid Mechanics Laboratory (1) I, II

Three hours of laboratory.
Prerequisite: Credit or concurrent registration in Engineering 116.
Laboratory studies in solid mechanics. Experimental stress analysis. Experimental confirmation of theory.

## 11. Transfer and Rate Processes (3) 1, iI

Prerequisite: Engineering 187A.
Fundamentals of rates of change in enthalpy and composition of matter; heat and mass transfer and chemical reaction rates.

## 120A. Structural Analysis I (4) I, II

Prerequisite: Engineering 116.
Principles of mechanics applied to analysis of beams, frames, trusses, and threePrinciples frameworks, Graphical methods, influence lines; deflections; introduc ion to statically indeterminate structures and moment distribution.

## 120B. Structural Analysis II (3) I

Prerequisite: Engineering 120A
Analysis of statically indeterminate structures by virtual work. Advanced treatment of slope deflection, moment distribution. Arch analysis, secondary stresses in trusses. Advanced treatment of influence lines.

## 121. Reinforced Concrete (3) il

Prerequisite: Engineering 120A.
Properties and characteristics of reinforced concrete; design of structural comprents. Introduction to plastic theory and limit design

## 22. Soil Mechanics (3) I

Two lectures and three hours of laboratory
Two log 53, Engineering 116, and credit or concurrent registration in Engineering 115
End mechanical properties; soil classification, com Mechanics of sois; phlidation, and shear strength. Laboratory tests and related paction, swellems.

## 123. Applied Hydraulics (3)

Prerequisite: Engineering 115.
Application of principles of fluid mechanics in the fields of hydrology, water supply, hydraulic machinery, drainage, and waste disposal

## 124. Foundation Engineering (2)

Prerequisite: Engineering 122.
Soil mechanics theories applied to the design of shallow and deep foundations; teral pressure of soils; design of retaining walls.
125. Sanitary Engineering (3) II

Prerequisite: Engineering 123
Prerequisite: Eng in waste-water disposal; physical and Unit processes used in waly water and water
127. Highway Engineering (3) I

Two lectures and three hours of laboratory.
Prerequisites: Engineering 128A and credit or concurrent registration in Engineering 123.
Highway planning, economics, and administration; geometric design; traffic engineering; subgrade structure; bituminous and portland-cement concrete pavements.
128A. Surveying for Civil Engineers (3) II
Two lectures and three hours of laboratory.
Prerequisite: Engineering 30.
Principles of plane surveying. Measurement of horizontal distance, difference in elevation, and angles. Traverse surveys and computations. Horizontal and vertical curves. Principles of stadia. Topographic surveys. Earthwork.

## 128B. Advanced Surveying (3) I

Two lectures and three hours of laboratory.
Prerequisite: Engineering 128A.
Theory and application of precise control surveys; cadastral surveys; specialized surveying operations.

## 129. Highway Materials (2) II

One lecture and three hours of laboratory.
Prerequisite: Credit or registration in Engineering 127 or Engineering 122.
Selection, design, and control of mixes of various materials used in highway engineering practice. Emphasis on strength and properties of plain concrete and asphalts.

## 133. Stochastic Signals (3) I

Formerly part of Engineering 196B
Prerequisite: Engineering 187A or Mathematics 118A.
Random signals, correlation functions, power spectral densities, the Gaussian process, narrow band processes. Applications to communication systems.

## 134. Communication Circuits (3) I

Formerly Engineering 134B, Analysis and Design of Electronic Circuits.
Prerequisite: Engineering 114.
A continuation of Engineering 114, to include regulated power supplies, oscilA continuation of Engineering 114, to include regulated power supplies, oscillator and detector circuits; switching circuits and transient response of amplifiers.

134L. Communications Circuits Laboratory (1) I
Formerly Engineering 135B, Electronic Circuits Laboratory.
Three hours of laboratory.
Prerequisite: Engineering 114L.
Regulated power supply systems; oscillator, modulator, detector, and switching circuits; superheterodyne receivers and television circuitry.

## 135. Modulation Theory (3)

Formerly Engineering 185.
Prerequisite: Engineering 112
Theory and performance characteristics of modulation and demodulation; spectral characteristics and noise performance of carrier systems: amplitude, frequency and phase, pulse coded, and compound modulation.

## 137. Communication Networks (3) I

Prerequisites: Engineering 102, 111, and 187A or Mathematics 118A.
Theory and application of transmission lines, including analysis by matrix notation; use of Smith chart and other transmission line charts; impedance-matching with transmission line stubs and lumped constants; theory and design of constant-k m -derived, and other types of filter networks.

## Engineering

## 139. Advanced Field Theory (3) II

Formerly Engineering 139A.
Prerequisites: Engineering 137 and credit or concurrent registration in EngineerPrerequisites: Engineering 137 and cre.
ing 134, and 187 B or Mathematics 118B.
Time-varying electric and magnetic fields. Application of Maxwell's equations to Time-varying electric and magnetic fields. Applicatore circuit impedance elements; vector equations to ave propagary, electrical phenomena; waveguides and resonators, electromagnetic radiation.

## 39L. Microwave Measurements Laboratory (1) it

Formerly Engineering 139B
Three hours of laboratory.
Prerequisites: credit or concurrent registration in Engineering 134L and 139.
Experimental study of frequency generation including klystrons, magnetrons and signal generators. Impedance, attenuation, phase, frequency, and power measurements; coaxial lines and waveguides; propagation in air, resonant cavities and antennas.

## 40. Principles of Heat Transfer (3) I

Prerequisites: Engineering 108 or 110; and 187A
Heat transfer by conduction, convection, radiation, and combinations thereof; introduction to aerodynamic heating and heat transfer by phase change.

## 41. Internal Combustion Engines (3)

Prerequisite: Engineering 148.
Analysis of idealized and real internal combustion engine cycles; combustion Anale of reciprocating and rotary types of internal combustion problems; performanes. Principles of reaction motors.

## 142. Elements of Energy Conversion (3) I

## Formerly Fuels and Combustion.

Prerequisite: Engineering 108
Principles of physics and chemistry applied to the analysis of a broad spectrum Principles of physics and energy conversion devices from an engineering point of view.

## 143. Gas Dynamies (3) I

Prerequisites: Engineering 108 and 115.
Thermodynamics of high velocity compressible fluid flow. Shock regions; adiaatic and diabatic flow. Applications to the propulsive duct and discharge nozzles.

## 144. Thermal Environmental Engineering (3)

Prerequisite: Engineering 140. Two-phase flow. Heat transfer. Thermoelectric Psychrometrics. Mass transfe efrigeration. Change of phase.

## 145. Mechanics of Machinery (3)

Prerequisite: Engineering 40 and 50 B
An extension of the principles of statics and dynamics to mechanisms and to An extension of the prinis of velocity and acceleration and the determination mechanical systems. Anarces. Evaluation of stability of systems.

## Machine Design (3) I, II

Prerequisite: Engineering 116
Application of mechanics, physical properties of materials, and strength of maApprication design of machine elements.

## 146B. Advanced Machine Design

Prerequisite: Engineering 146A.
Advanced topics in strength of materials including energy methods, stress conmachine elements.

147A. Introduction to Mechanical Vibrations (3) I
Prerequisites: Engineering 50B, 116, and 187A
Analysis of mechanical vibration; single- and multi-degree of freedom systems; free and forced vibrations; vibration isolation; vibration absorbers. Theory of vibration measuring instruments.

## 147B. Experimental Vibrations (3) II

Prerequisite: Engineering 147A.
Experimental problems utilizing vibration excitation equipment, recording sysExperimental problems utilizing vibration ex
tems, transducers, digital and analog computers.

## 148. Engineering Thermodynamics (4) I

Three lectures and three hours of laboratory.
Prerequisite: Engineering 115.
Further development of the laws of classical thermodynamics. Applications to energy conversion devices.

## 149. Advanced Thermodynamics (3) I

Prerequisite: Engineering 148.
Cyclic and analytical methods of thermodynamic analysis. Development of general thermodynamic equations and methods of solution. Introduction to microscopic thermodynamics with application to the study of transport properties.

150A. Low Speed Aerodynamics (3) I
Prerequisites: Credit or concurrent registration in Engineering 115 and 115L. Subsonic flow, airfoil and wing theory, experimental characteristics of wing sections, high lift devices.

## 150B. High Speed Aerodynamics (3) II

Prerequisites: Engineering 143 and 150A.
Supersonic flow, two- and three-dimensional compressible flow, wings in compressible flow, two- and three-dimensional method of characteristics, transonic flow.

151A-151B. Aerospace Structural Analysis (3-3) I, II
Prerequisites: Engineering 116 and credit or concurrent registration in Engineering 187 B or Mathematics 118B. Engineering 151A is prerequisite to 151 B .
Methods of structural analysis including both the static and dynamic aspects of problems encountered in the flight of aerospace vehicles.

## 152. Aircraft Propulsion Systems (3) II

Prerequisite: Engineering 148 or 150A.
Theory and performance characteristics of aircraft propulsion systems including reciprocating engines, turbo-jets, ram-jets, etc.

## 153A. Aerospace Flight Mechanics (3) II

Formerly Engineering 153.
Prerequisites: Engineering 50B, and 187A or Mathematics 118A.
Aerodynamics and dynamics of ballistic missiles; guidance systems; orbits and space trajectories; effects of aerodynamics, mass, rotation and shape of the earth on ballistic and space trajectories. Computer programming and problem solutions will be emphasized.

## 153B. Intermediate Aerospace Flight Mechanics (3) I

Prerequisite: Engineering 153A.
A continuation of Engineering 153A to include orbit determination techniques, general and special perturbations, artificial satellites, rocket dynamics and transfer orbits, earth-moon trajectories, and interplanetary trajectories.

## Engineering

154. Experimental Aerodynamics (2) I, II

One lecture and three hours of laboratory.
Prerequisites: Credit or concurrent registration in Engineering 150A.
Operating characteristics of subsonic and supersonic wind tunnels. Aerodynamic characteristics of wings and bodies. Flow visualization techniques. Force, momen and pressure distribution measurement. Use of hot-wire anemometer and schlieren equipment.
155. Matrix Methods in Aerospace Structures (3) II

Prerequisite: Engineering 151B.
Static and dynamic analysis of aerospace structures utilizing matrix methods.
156. Intermediate Dynamics (3)

Prerequisites: Engineering 50B, 60, and Engineering 187A or Mathematics 118A.
Kinematics and kinetics of systems of particles and rigid bodies. Dyname analysis procedures for studying mechanical, electrical, and electromechanical systems. Variational methods.

## 157. Intermediate Fluid Mechanics (3)

Prerequisites: Credit or concurrent registration in Engineering 115, and Engineering 187 B or Mathematics 118 B .
Kinematics of fluid motion. Conservation of mass, momentum, and energy. Ideal and viscous flows and applications. Boundary-layer approximations.

## 158. Aircraft Design and Performa

Prerequisite: Engineering 150B.
Aircraft design and evaluation including choice of airfoil and wing planform Aircraft design and evaluation including choice of airfoila and wing design, control surfaces, power plants, and integration of the separate aircraft components.
159. Aircraft Stability and Control (3) I

Formerly Engineering 190G, Engineering Applications.
Prerequisites: Engineering 150A, 154, and credit or concurrent registration in Engineering 187B.
Static stability and control, general equations of unsteady motion, stability derivatives, stability of uncontrolled motion, response of aircraft to actuation of controls.

## 160A-160B. Principles of Chemical Engineering (3-3)

Same course as Chemistry 160A-160B.
Prerequisite: Credit or concurrent registration in Engineering 108 or Chemistry 109 A or 110 A , or equivalent.
Industrial stoichiometry; fluid flow and heat transfer as applied to unit operations such as evaporation, distillation, extraction, filtration, gas-phase mass transfer, drying, and others. Problems, reports, and field trips.

## 161. Creativity in Design (3) II

Methods to stimulate creativity in design. Investigation of hidden blocks to Meative thought. Emphasis on placing students in a design situation requiring an inventive or creative solution.
162. Transistor Circuit Analysis (3) II

Formerly Engineering 182.
Prerequisite: Engineering 114.
Analysis and design of transistor voltage and power amplifier circuits by use of duality and matrix methods. Feedback amplifiers, audio amplifiers, video amplifiers, power supplies, and oscillators; transient analysis and noise considerations.

## 103. Electronic instrumentation (3)

Formerly Engineering 136.
Prerequisite: Engineering 101.
Application of electronics to the instrumentation of mechanical, hydraulic and electrical devices. Indicating and recording instruments.

## 164. Semiconductor Devices (3)

Formerly Engineering 192.
Prerequisite: Engineering 114.
Tunnel diodes and backward diodes, breakdown diodes, multilayer diodes, var fror diodes, silicon controlled rectifiers and switches, unijunction transistors, field effect transistors, and hot electron devices.

## 67. Controi System Components (3) 1

Formerly Engineering 131, Electromechanical Control Devices
Prerequisites: Engineering 100, 101, and 111.
Position transducers, phase-sensitive demodulators, static magnetic and rotating Position transducers, phase-sensitive demodulators, static magnetic and
1671. Control Systems Components Laboratory (1) II

Formerly an integral part of Engineering 131.
Prerequisite: Credit or concurrent registration in Engineering 167.
Experimental determination of transfer functions for control system components.

## 168. Feedback Control Systems (3) I

Formerly Engineering 138A.
Prerequisites: Engineering 112 and 114
Analysis of regulatory systems including servomechanisms by the Laplace transform method. System performance and stability; Nyquist, Bode, and root-locus dia grams; elementary synthesis techniques. Practical components and examples of typical designs.

## 169. Advanced Feedback Control Systems (3) II

Prerequisite: Engineering 168
A continuation of Engineering 168 to include feedback compensation, advanced compensation techniques, signal flow theory, state-variable techniques, introduction to non-linear and sampled-data control systems.

## 169L. Feedback Control Systems Laboratory (1)

Formerly Engineering 138B.
Three hours of laboratory.
Prerequisites: Engineering 114L, 167, and credit or concurrent registration in Engineering 168.
Analysis of steady-state and transient response of uncompensated and compensated feedback control systems using transfer functions and frequency response techniques.

## 73. Electronic Analog Systems (3)

Formerly Engineering 193.
Prerequisite: Engineering 114
Modern analog computers using electronic and electro-mechanical elements. Operational amplifiers, integrators, summing devices and non-linear elements.

## 74. Pulse and Digiral Circuirs (3) I

Formerly Engineering 194.
Prerequisite: Engineering 114.
Linear waveshaping, diode and transistor switching characteristics, clipping and clamping circuits, comparators, microcircuit logic elements, multivibrators, and field effect transistor switching characteristics and circuits.
175. Advanced Pulse and Digital Circuits (3) II

Prerequisite: Engineering 174
Introduction to linear integrated circuits; linear voltage and current sweep circuits, blocking oscillators, negative resistance switching devices and circuits, analog--diguits.
176. Logic Design and 5witching Circuits (3) I

Formerly Engineering 195.
Prerequisite: Engineering 101
Switching algebra, Karnaugh map and Quine-McCluskey tabular methods of minimization; multiple output functions; coding and decoding; economical NAND and NOR element implementation; asynchronous sequential circuit analysis and design.

## 177. Advanced Logic Design and Switching Circuits (3)

Prerequisite: Engineering 176
Synchronous sequential circuit design: counters, shift registers, memory element properties, state assignment methods. Introduction to threshold logic

## 177L. Switching Circuits Laboratory (1) I

Prerequisites: Engineering 174 and concurrent registration in Engineering 177
Experiments involving switching applications of diodes, bipolar transistors, field effect transistors, and integrated circuits. Implementation of logic design of combinational and sequential switching systems.

## 180. Principles of Engineering Economy (3) 1,

Prerequisite: Engineering 115
Analysis of the costs of development and promotion, construction, operation, depreciation and depletion. Capital recovery, income, return and yield. Valuations and appraisals, cost analysis and financial analysis. Application to engineering problems.
181. Hydrodynamics (3)

Prerequisites: Engineering 50B or Physics 105, and Engineering 187A or Mathematics 118A or 119 or 124
Kinematics, equations of continuity, energy, and momentum of perfect fluids. Kinematics, equatonformal transformations. Three-dimensional and two-dimenintroduction irrotational motion, with applications to physical problems. Vector notation will be used.
183. Simulation of Engineering Sysiems (3)

Two lectures and three hours of laboratory
Prerequisites: Engineering 40 and 187A.
Analysis and design of engineering systems using modern analog and digital Analysis andulation of dynamic systems. Application to problems in mechanics, compures. thermodynamics, and control systems
194. Experimental Strain Measurements and Analysis (3)

Two lectures and three hours of laboratory
Prerequisites: Engineering 60 and 116.
Prerequisites. Eng for measuring deformation, strains, and forces. Emphasis on instrumentation.
86. Intermediate Solid Mechanics (3) II

Prerequisite: Engineering 116.
Shear center, curved flexural members, beams on elastic foundation, flat plates Shear cenon-circular sections, thick-walled cylinders, stress concentrations, energy methods.

187A-187B. Methods of Analysis (3-3) I, It
Prerequisite: Mathematics 52; Engineering 187A is a prerequisite for Engineering 187B.
Solutions of advanced engineering problems in fluids, thermodynamics and electricity utilizing analytical methods, analogs, dimensional analysis and the theory of models.
188. Digital Solutions of Engineering Problems (3) I, II

Prerequisites: Engineering 40 or Mathematics 7, and Engineering 187A.
Digital solution of classes of engineering problems. Application of numerical Digital solution of classes of limitations imposed by computer and programing language characteristics.
189. Automatic Control Systems (3) II

Prerequisites: Engineering 50B, 100B, and 187A.
Not open to students filing an electrical engineering master plan.
Analysis of the output-input characteristics of linear, mechanical, electrical, hydraulic, and pneumatic control systems.

190A. Civil Engineering Structural Design (3) II
One lecture and six hours of laboratory.
Prerequisites: Engineering 120A and 122.
Structural design in steel; structural connections; tension and compression members; beams; building code requirements applied to design of buildings of various structural materials including steel.

190C-190D. Mechanical Engineering Applications (2-2) 1, II Six hours of laboratory.
Prerequisites for 190C: Engineering 106, 108, and 116.
Prerequisites for 190D: Engineering 145, 146A, 148, and 190C.
Applications of engineering principles to design of machinery and energy conversion systems. Individual student projects.

190G-190H. Aerospace Engineering Applications (2-2) I, II
Six hours of laboratory
Prerequisites for 190G: Engineering 150B, 151A, and 154.
Prerequisite for 190 H : Engineering 190G.
Student projects in aerospace design.
191. Microwave Devices (3)

Prerequisite: credit or concurrent registration in Engineering 139.
Varactor diodes and applications, microwave switches, limiters and phase shifters, detector and mixer diodes and circuits, avalanche transit-time devices, bulk-effect devices, microwave transistors and circuits.

196A-196B. Advanced Engineering Topics (1-3, 1-3), 1, II
Prerequisites: Minimum grade point average of 2.0 in engineering or approval of the Academic and Ethical Standards Committee of the School of Engineering. Modern developments in engineering. Six units maximum credit for any combination of Engineering 196A, 196B, and 199. (Formerly numbered Engineering 196.)

AE 200. Seminar (1-3)
AE 202. Aeroelasticity (3)
AE 204. Flight Dynamics-Stability and Control (3)
AE 205. Flight Dynamics-Theory of Flight Paths (3)
AE 222. Aerothermal Structural Analysis (3)
AE 241. Hydrodynamic Stability (3)
AE 242. Theory and Aerodynamics of Transonic Flight (3)
AE 243. Supersonic Flow Theory (3)
AE 244. Hypersonic Flow Theory (3)
AE 245. Magnefoffuidmechanics (3)
AE 246. Rarefied and Real Gas Flows (3)
AE 250. Principles of Electromagnetic Propulsion (3)
AE 253. Seminar on Boundary Layer Topics (3)
AE 296. Advanced Topics in Aerospace Engineering (2 or 3)
AE 297. Research (1-3)
CE 200. Seminar (2 or 3 )
CE 201. Advanced Theory of Structures (3)
CE 202. Design of Thin Shell Structures (3)
CE 203. Plastic Design in Steel (3)
CE 204. Advanced Problems in Structural Design (3)
CE 205. Prestressed Concrete Structures (3)
CE 206. Matrix Analysis of Structures (3)
CE 207. Dynamics of Structures (3)
CE 208. Numerical Methods in Structural Engineering (3)
CE 209. Computer Analysis of Structures (3)
CE 210. Finite Element Analysis of Structures (3)
CE 220. Traffic Engineering (3)
CE 221. Airport Engineering (3)
CE 230. Open Channel Hydraulics (3)
CE 231. Engineering Hydrology (3)
CE 232. Fluvial Hydraulics (3)
CE 235. Water Quality Engineering (3)
CE 236. Water Quality Processes I (3)
CE 237. Water Quality Processes II (3)
CE 240. Advanced Soil Mechanics (3)
CE 241. Advanced Foundation Engineering (3)
CE 242. Seepage and Earth Dams (3)

CE 243. Experimental Soil Mechanics (2)
CE 244. Soil Structure Interaction (3)
CE 280. Seminar in Structural Engineering (2 or 3
CE 281. Seminar in Transportation Engineering (2 or 3)
CE 282. Seminar in Soil Mechanics and Foundation Engineering (2 or 3)
CE 283. Seminar in Hydraulic Engineering (2 or 3)
CE 284. Seminar in Sanitary Engineering (2 or 3)
CE 285. Seminar in Construction Engineering (2 or 3)
CE 296. Advanced Topics in Civil Engineering (2 or 3)
CE 297. Research (1-3)

## Electrical Engineering

E 200. Seminar (1-3)
EE 201. Seminar in Electromagnetic Systems (1-3)
EE 202. Seminar in Electronic Design (1-3)
EE 203. Seminar in Digital Systems (1-3)
EE 204. Seminar in Feedback Control Systems (1-3)
EE 210. Linear System Analysis (3)
EE 211. Linear System Synthesis (3)
EE 212. Synthesis of Linear Active Networks (3)
EE 214. Computer-aided Network Analysis and Design (3)
EE 216. Noise in Electrical Devices (3)
EE 220. Feedback Control Systems (3)
EE 222. Sampled-Data Systems (3)
EE 224. Non-Linear Feedback Control Systems (3)
EE 225. State Space Analysis of Control Systems (3)
EE 226. Optimal Control Systems (3)
EE 230. Topics in Logic Design (3)
EE 232. Transisfor Circuit Design (3)
EE 234. Semiconductor RF Circuit Design (3)
EE 236. Electronic Digital Systems (3)
EE 240. Radiation and Propagation (3)
EE 242. Microwave Networks (3)
EE 244. Microwave Antennas (3)
EE 246. Radar Systems (3)
EE 250. Quantum Electronics (3)
EE 252. Optical Communications (3)
EE 296. Advanced Topics in Electrical Engineering (2 or 3)
EE 297. Research (1-3)


Engineering
E 290. Problem Analysis (3) E 298. Special Study (1-3) E 299. Thesis or Project (3)

> Engineering Mechanics

EM 200. Seminar (2 or 3)
EM 201. Advanced Dynamics (3)
EM 203. Theory of Vibrations (3)
EM 204. Theory of Nonlinear Vibrations (3)
EM 205. Theory of Random Vibrations (3)
EM 210. Continuum Mechanics (3)
EM 221. Theory of Elasticity (3)
M 222. Theory of Anisotropic Elasticity (3)
EM 223. Energy Methods in Mechanics (3)
EM 225. Theory of Plates (3)
EM 226. Theory of Shells (3)
M 227. Theory of Elastic Stability (3)
EM 233. Theory of Plasticity (3)
M 243. Advanced Fluid Mechanics I (3)
EM 244. Advanced Fluid Mechanics II (3)
EM 296. Advanced Topics in Engineering Mechanics (2 or 3) EM 297. Research (1-3)

## Mechanical Engineering

ME 200. Seminar (2 or 3)
ME 201. Seminar in Thermodynamics and Fluid Flow (2 or 3)
ME 202. Seminar in Cryogenics (2 or 3)
ME 203. Seminar in Engineering Materials (2 or 3)
ME 204. Seminar in Engineering Systems (2 or 3)
ME 205. Seminar in Operations Research in Engineering (2 or 3)
ME 206. Seminar in Nuclear Engineering (2 or 3)
ME 207. Seminar in Mechanical Design (2 or 3)
ME 220A-220B. Mechanical Vibrations (3-3)
ME 221. Stress Analysis (3)
ME 222A-222B. Synthesis of Machines (3-3)
ME 224. Fluid Power and Control Systems (3)
ME 231A. Advanced Science of Materials 1 (3) ME 231B. Advanced Science of Materials II (3)

ME 233. Reactor Materials (3)
ME 234. High Temperature Materials (3)
ME 246. Advanced Topics in Automatic Controls (3)
ME 250. Analytical Thermodynamics (3)
ME 260. Conduction Heat Transfer (3)
ME 262. Convection Heat Transfer (3)
ME 264. Radiation Heat Transfer (3)
ME 267. Cryogenic Engineering (3)
ME 270. Gas Dynamies (3)
ME 274. Boundary Layers in Internal Flows (3)
ME 276. Bearing Design and Lubrication (3)
ME 280. Aircraft and Missle Propulsion (3)
ME 281. Propulsion Systems for Spacecraft (3)
ME 284. Theory of Turbomachines (3)
ME 285. Direct Energy Conversion (3)
ME 296. Advanced Topics in Mechanical Engineering (2 or 3)
ME 297. Research (1-3)

## School of Social Work <br> Kurt Reichert, Dean; Joseph B. Kelley, Associate Dean

## Accreditation

The graduate program of the School is accredited by the Commission on Accreditation of the Council on Social Work Education.

## Program and Objectives

The School of Social Work offers a two-year graduate curriculum leading to the Master of Social Work degree under approval granted by the Trustees of the the Master of Socialleges in May, 1963. The School also offers a program of professional education which commences in the undergraduate curriculum and continues through one calendar year of graduate work, leading to the Master of Science in Social Work degree. The curriculum was approved in January, 1969, on an experimental basis for a four-year period effective in September, 1970, by the Accreditation Commission of the Councr in social welfare at San Diego State or dents completing he equivalent can be considered for this program.
The objectives of the School of Social Work at San Diego State are to equip students with the essential knowledge, philosophy and basic skills for their responsible entry into the profession of social work. In order to achieve these objectives sible entry into the profession of social work. In order to achieve these or individual the School will assist students: to develop a philosophy which recognaztitudes which human welfare as the purpose and goal of social pof professional relationships and will permit the development and the discipline and self-awareness essential to the professional standards; to professional social worker; to attain a level of competence necessary for beginning professional social worker; to attain aresonsibility for the continued development professional practice, and to accept responsibility
For detailed information regarding admission to the School and to its graduate curriculum, see the Graduate Bulletin.

## Faculty

Emeritus: Witte Kelley, Lee, W., Maxwell, Morgan, R., Ontell, Reichert,
Professors: Guzzetta, Kelley,
Stumpf, Tebor, Weinberger
Stumpf, Tebor, Wers: Andresen, Brennen, Griffin, Haworth, G., Horowitz, Ishi-
Associate Professors: Andresen, Brel, Kann, Kessel, Manis, Pilcher, A., Pilcher, D.
kawa, Kahn, Kesse, Ajemian, Anderson, D. M., Baily, Bistritz, Clary, Cohen, L.
Assistant Professors Gilliam, Guidry, Haworth, J., Herman, Hollander, Raymer, Fletcher, Sardinas, Totman, Watson, C., Watson, E.
Lecturers: Lucius, Seargeant

## Appointed under Outside Grants

Assistant Professor: Sotomayor
Lecturers: Aikens, Anderson, Brewer, Kukkonen, Manos, Schiffrin, Shenko, Treske, Weissman

Offered by the School of Social Work
Master of Science in Social Work
Master of Social Work
Major in social welfare with the A.B. in liberal arts and sciences
Minor in social welfare

Social Welfare Major with the A.B. in Liberal

## Arts and Sciences

This major provides the undergraduate portion of the program leading to the Master of Science in Social Work. In addition, it serves broad educational purposes in providing preparation for more effective participation in community affairs based on an understanding of contemporary social welfare programs. It prepares professional social work education at the graduate level, and it qualifies one for admission to graduate professional schools of social work.
Preparation for the major. Anthropology 1C; Economics 1A-1B; Psychology 1; Sociology 1,10, 60 ( 24 units).
Recommended: Biology 1 and 2, Political Science 1 and 2, and courses in physiology.
Maior. A minimum of 30 upper division units to include: Social Welfare 100A100B, 180A-180B, 182, and 189A-189B; Sociology 140 or Psychology 145; three units selected from Psychology and three units selected from Sociology.
Recommended: Social Welfare 187 (strongly recommended for those students planning to seek admission to the San Diego State School of Social Work), Sociology 122, Psychology 106, Biology 159, and courses from anthropology, literature, history, philosophy, political science, economics, psychology, and sociology.
Students should consult with their adviser in social welfare for selection and arrangement of courses.

## Social Welfare Minor

The minor consists of 15 units in social welfare, nine units of which must be in upper division courses.

## Social Welfare

30. Contemporary Courtship and Marriage (3) I, II

Developing understanding and ability to evaluate various concepts, attitudes and value systems as they relate to contemporary courtship, marital and family relastudents with credit in Home Economics 35, Sociology 35, or other lower division course in courtship and marriage or marriage and the family. (Formerly numbered Social Welfare 35.)
80. Introduction to Social Welfare (3) I, II

Two lectures and three hours of field observation.
Orientation to the field of social welfare. Readings, class discussions, and observation of social welfare activities in the community.

100A-100b. Man in Society (3-3) I, II
Prerequisites: Biology 1 and 2, Psychology 1, and Sociology 1; Social Welfare 100 A is a prerequisite to 100 B .
Biological, psychological, and social aspects of human growth and development from birth to death. Integration of concepts from various disciplines.
180A-180B. Social Welfare as a Social Institution (3-3) I, II
Prerequisites: Sociology 1 and 10; Social Welfare 180A is prerequisite to 180B.
The institutional nature of social welfare and its relationship to other institutions in society.

## 182. Social Work as a Profession (3) I, II

Prerequisite: Social Welfare 100B and 180B.
Social work as a profession; its philosophical bases, values, norms, functions, methods, and occupational roles.
85. Public Welfare (3) I, II

A historical and current perspective of public welfare. Analysis of current proA historical al insurance, public assistance, general relief, and other public welfare oolicies and programs.
187. Current Developments in Social Work (3) I, II

Prerequisites: Sociology 60; Social Welfare 100B and 180B.
ources, nature, and uses of social work theory and research. Application of the orces, nas se, and practice of social work
189A-189B. Field Experience in Social Welfare (3-3) I, il
Two lectures and eight hours of field experience.
Prectis. Social Welfare 100B and 180B; Social Welfare 189A and credit or Prerequisites: Soction in 182 are prerequisite to 189B.
Laboratory field assignments in selected social welfare activities.
197. Investigation and Report (3) I, II

Prerequisite: Consent of instructor.
Analysis of special topics in social welfare.

## Social Work

200. Social Welfare Policy and Services I (2)
201. Social Welfare Policy and Services II (2)
202. Social Welfare Policy and Services III (2)
203. Social Welfare Policy and Services IV (2)
204. Social Work Administration I (2)
205. Human Behavior and Social Environment I (4)
206. Human Behavior and Social Environment II (2)
207. Human Behavior and Social Environment III (2)
208. Social Work Practice I (2)
209. Social Work Practice II (2)
210. Social Work Practice III (2)
211. Social Work Practice IV (2)
212. Social Work Practice V (2)
213. Social Work Practice VI (2)
214. Social Work Practice VII (4)
215. Social Work Practice VIII (4)
216. Social Work Practice IX (8) S
217. Field Instruction I (4)
218. Field Instruction II (4)
219. Field Instruction III: Individuals, Families, and Groups (4-5
220. Field Instruction IV: Individuals, Families, and Groups (4-5)
221. Field Instruction V: Organizations and Communities (4-5)
222. Field Instruction VI: Organizations and Communities (4-5)
223. Seminar. Social Work Analysis (1-4)
224. Seminar. Current Social Issues (1-4)

290A-290B. Social Work Research Methods and Analysis (2-2)
291 Seminar (2-3)
297A-297B. Research (2-2)
298. Special Study (1-3)

## Faculty and Officers of Administration 1970-1971

LOVE, MALCOLM A. (1952) President
A.B., Simpson College; M.A., Ph.D., University of Iowa; LL.D., Simpson College; L.H.D., A.B., MAmpson College, M.A., Ph.D., University of Iowa; LL.D., Simpson College; L
Colorado State College; LL.D., University of Nevada; LL.D., University of San Diego. ABBOTT, MITCHEL T. (1964) Associate Professor of Chemistry ACKERLY, ROBERT S., JR. (1963) Asociate Dean, Staffing and Reporting
B.A., College of Wooster; A.M., Colgate University; Ed.D., Indiana University.
ACKLEY, JOHN W. (1947) Professor of Speech Communication A.B., University of (Mrs. H. L.) (1949) Ans, EILEEN (Mstant Education Resource Center Librarian
ADAMS W. Willamette University; B.S. in L.S., University of Denver. ADAMS, WILLIAM J. (1955) Professor of Speech Corm.
B.S., McMurry College; M.A., Northwestern University; Ph.D., Stanford University.
GGARWAL, SOHAN L (1969) Assistant Professor of Civil Engineering of Texas. of Texas.
$\ddagger$ AGUIRRE, EDWARD (1963)
Associate Professor of Industrial Arts
AJEMIAN, JAMES A. (1970) Assistant Professor of Social Work B.A., Harvard College; M.S., Columbia University : Ph.D. candidate, University of Michigan. AKERS, FRED C. (1966) Associate Professor of Marketing
B.S., University of Missouri; M.B.A. (Marketing), Northwestern University; M.B.A. (EcoB.S.,., University of Missouri, M.B.A.
nomics), Ph.D., University of Chicago.

ALEXANDER, JAMES B. ( 1967 Asso
A.B., San Diego State College; M.S., Ph.D., University of California. ALF, EDWARD F., JR. (1963). Professor of Psychology ALLISON, EDWIN C. (1960) Professor of Geology

Assistant Professor of Music ALMOND, FRANK W. (1968) College; Ph.D., Florida State University. altamura, NICHOLAS C. (1967), Assistant Professor of French ALS., Ithaca College; M.Ed., University of Arizo AMBLE, KJELL (1962) B.A., Denison University; M.A., Ph.D., Northwestern University. Assistant Sciences Librarian AMBRIANO, JOHN D. (1969)
B.A., ANDERES, EUGENE A. (tate College; Ph.D., Oregon State University.
ANDERSON, ALLAN W. (1962) Professor of Philosophy B.A., Washington Mir Professor of Anthropolog ANDERSON, ARTHUR J. O. (1961). A.B., San
California.

ANDERSON, DEL M. (Mrs. E. F.) (1969)
A.B., Assistant Professor of P

ANDERSON, EVANS L. (1954) Professor of Elementary Education . Uine ANDERSON, GRAYDON K. (1949)
A.B., Willamette University; Ph.D., University of Wisconsin.
ANDERSON, HAYES L. (1966) Assistant Professor of Telecommunications and Film B.A., Oregon State University; M.A. and adaral Assistant Professor of Physical Science ANDERSON, LEE R. (1968 M.A., Stanford Univessity; Mniversity of Oregon; M.S., Ph.D., Oregon State University B.S., Stanform PAL S. (1955) Mrofessor of Elementary Education A.B., Colorado State College; M.S., Ph D, Universin

士On leave, year 1970-71.
†On leave, spring 1970-71.
 ANDERSON, W. CARLISLE (1955) . Professor of Industrial Arts ANDERSON, W. CARLISLE ( 1955 ) Prose M.A., Nebraska State Teachers Colege; M.A. Ph.D., University of Minnessora.

ANDRAIN, CHARLES F. (1964) , Wh. Whittier College; M.A., Ph.D., University of California. Professor of Political Science B.A., Whittier Colicge, M.A., Ph.D., University of California.

ANDRESEN, GRACE E. (Mrs.) (1970) (Under contract 1968-70)
B.S., University of Mlinois; M.S.W., Tulane University Associate Professor of Social Work

ANGI.NB, RONALD J. (1969) College Ph.D., University of Texas. Assitant Professor of Astronomy ANINGER, THOMAS (1967)
B.A., M.A., Ph.D., University of Calformia, Los Angeles. Assitant Professor of English ANNAS, ALICTA M. (1970) A. Assistant Professor of Drama ANTHONY, SALLY M. (Mrs.) (1965) A. (19., University of California, Los Angeles; Ed.M., Ed.D., Rutgers University.
 $\ddagger$ APPLEBY, JOYCE O. (Mrs. A. A. (1967) Associate Professor of History
B.A. Stanford Univesity; M.A., University of California, Santa Barbara; Ph.D., Claremont BPLEBY, Stanford
Graduate School.
ARCHER, ELLIS C. C. (1956) Professor of Information Systems
B.S., Northwestern State College; M.S., University of Kansass; Ed.D., Stanford Univesity. ARFMAN, MARILYN B. (Mrs. H. T.) (1969)

Lecturer in Sociology
Associate Professor of Management
ATCHISON, THOMAS I. (1965).
A.B. Stanford University; M.B.A., University of California, Los Angeles; D.B.A., University
of Washington. of Washington.
 ATKINSON, BEATRICE (1954)
B.S., College of St. Scholastica; M.A., San Diego State College. Associate Professor of Nursing
AUSTIN, JOAN F. (1970) Assistant Professor of Art
B.A., Califomia


 B.A., Unvern

BABICH, ROGER M. (1970)
B.S., Western Illinois University; M.A., Ph.D. Assistant Professor of Speech Communication BABILOT, GEORGE (1956)
A.B., Hastings College; M.A., University of Nebraska; Ph.D., University of Oreser of Economics BACON, RICHARD P. (1963), Lecturer in Mathematics
BAER, ADELA S. ( 1962 ) Professor of Biology BALLEY, ALLAN R. (1968) Associate Professor of Accounting
 BAILEY, GERALD D. (1964) Assoiate Professor of Ind Instrial Arts
B.A., M.A., Central Washington State College; Ed.D., University of Missouri. BAILY, KAMIILA U. (Mrs.) ( 1966 ) Assistant Profesor of Social Work
B.A., M.S.W., Universicy of Denver; additional graduate work, Univessity of Southern California and Bryn Mawr College.
BAKER, CARROLL M. (1964) Associate Director of Libraries, Technical Services
A.B., University of Califoria, Los Angeles; M.A., Univesity of Chicago.
 A.B. Sap D
 $\ddagger$ On leave, year 1970-71.

BAKER, JAMES R. (1956, except 1961-62)
BAKER, KEEFE L . ( 1965 )
B.F.A., University of Colorado; M.F.A., State University of lowa.
BALDOCK, ALVIN O. (1969)
B.S., M.S., University of Southern California.
.A. (Social Sciences) B.A. (History), M.A., University of Leiden, Holland; Ph.D., Univer.
BALDWIN ELMER D. (1963)

BALLANTINE, FRANCIS A. (1949) Professor of Education
BABBER, WILLLAM. F. B.B.A., M.B.A., D.B.A., University of Washington.
BARCKLEY, ROBERT E. (1955)
B.S., University of North Dakota; M.A., Columbia University; Ph.D., Universsor of of Economics BARCLAY, A. BERNICE (1962) M. Reference Librarian BARNES, ALFRED C., TR. (1968) . Assistant Professor of Health Science and Safety

BARRERA, ERNESTO M. (1969) Arregena, Colombia; A.M., Ash.D., University of Southern Doctor en
California.
 BARTHOLOMEW, FRANCIS M., JR. (1967) Assistant Professor of History BARTHOLOMEW, FRANCIS M., JR. (1967),
BASSETT, ALLEN M. ( ${ }^{\text {B.A., Amherst }}$ College M.A., Ph.D., Columbia University. Associate Professor of Geology Professor of Mechanical Engineering
$\ddagger$ BAUER. EDWWARD $G$. (1956). .
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DAVIS, RICHARD LL ( 1969 )
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[^0]:    * A concentration with the B.S. in Business Administration.
    $\ddagger$ An interdisciplinary program
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    Offered by the Department of Microbiology
    Offered by the Department of Telecommunications and Film
    S5 Offered by the Department of Telecommunications and
    \#. Offered by the School of Social Work Comn

